



NE310L2

AT Commands Reference Guide

80668ST11067A Rev. 3 – 2022-01-20



APPLICABILITY TABLE

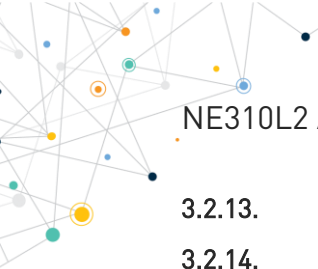
PRODUCTS
NE310L2-W1
NE310L2-WW



CONTENTS

APPLICABILITY TABLE	2
1. INTRODUCTION	9
1.1. Scope	9
1.2. Audience	9
1.3. Contact Information, Support	9
1.4. Symbol Convention	10
2. COMMANDS	12
2.1. Definitions	12
2.2. AT Command Syntax	13
2.2.1. String Type Parameters	14
2.2.2. Command Lines	14
2.2.2.1. ME Error Result Code - +CME ERROR: <err>	15
2.2.2.2. Message Service Failure Result Code - +CMS ERROR: <err>	16
2.2.3. Information Responses and Result Codes	16
2.2.4. Command Response Time-Out	17
2.2.5. Command Issuing Timing	17
3. AT COMMANDS REFERENCES	19
3.1. General Control and Config	19
3.1.1. Generic Modem Control	19
3.1.1.1. AT&F - Set to Factory-Defined Configuration	19
3.1.1.2. ATZ - Soft Reset	20
3.1.1.3. AT+GCAP - Capabilities List	21
3.1.1.4. AT+GMI - Manufacturer Identification	22
3.1.1.5. AT+GMM - Model Identification	23
3.1.1.6. AT+GMR - Revision Identification	24
3.1.1.7. AT+GSN - Serial Number	25
3.1.1.8. AT+CGMI - Request Manufacturer Identification	26
3.1.1.9. AT+CGMM - Request Model Identification	27
3.1.1.10. AT+CGMR - Request Revision Identification	28
3.1.1.11. AT+CGSN - Request Product Serial Number Identification	29
3.1.1.12. AT#CGMI - Request Manufacturer Identification	30
3.1.1.13. AT#CGMR - Request Revision Identification	31
3.1.1.14. AT#SWPKG - Request Software Package Version	32
3.1.1.15. AT+CFUN - Set Phone Functionality	34

3.1.1.16.	AT+CLAC - Available AT Commands	37
3.1.1.17.	AT+CMEE - Report Mobile Equipment Error	38
3.1.1.18.	AT+CEER - Extended Error Report	40
3.1.1.19.	AT+CSCS - Select TE Character Set	41
3.1.1.20.	AT+CMUX - Multiplexing Mode	43
3.1.1.21.	AT#PORTCFG - Connect Physical Ports to Service Access Points	46
3.1.1.22.	AT#CGMM - Request Model Identification	48
3.1.1.23.	AT#FWSWITCH - Set Active Firmware Image	49
3.1.2.	S Parameters	51
3.1.2.1.	ATS2 - Escape Character	51
3.1.3.	DTE - Modem Interface Control	52
3.1.3.1.	ATE - Command Echo	52
3.1.3.2.	ATQ - Quiet Result Codes	53
3.1.3.3.	ATV - Response Format	54
3.1.3.4.	ATI - Identification Information	56
3.1.3.5.	AT&C - Data Carrier Detect (DCD) Control	57
3.1.3.6.	AT&D - Data Terminal Ready (DTR) Control	58
3.1.3.7.	AT&K - Flow Control	59
3.1.3.8.	AT+IPR - UART DCE Interface Data Rate Speed	60
3.1.3.9.	AT+IFC - DTE-Modem Local Flow Control	62
3.1.4.	Call (Voice and Data) Control	64
3.1.4.1.	ATD - Dialup Connection	64
3.1.4.2.	ATO - Return to ON-Line Mode	65
3.2.	Network	66
3.2.1.	AT+CNUM - Subscriber Number	66
3.2.2.	AT+COPN - Read Operator Names	68
3.2.3.	AT+CREG - Network Registration Status	70
3.2.4.	AT+COPS - Operator Selection	73
3.2.5.	AT+CLCK - Facility Lock/Unlock	77
3.2.6.	AT+CPWD - Change Facility Password	80
3.2.7.	AT+CPOL - Preferred Operator List	82
3.2.8.	AT+CPLS - Selection of Preferred PLMN List	85
3.2.9.	AT+CSQ - Signal Quality	87
3.2.10.	AT#BND - Select Band	90
3.2.11.	AT#CEERNET - Extended Numeric Error Report for Network Reject Cause	94
3.2.12.	AT#CEERNETEXT - Extended Error Report for Network Reject Cause	98



3.2.13.	AT+CEMODE - Set Mode of Operation for EPS	101
3.2.14.	AT+CESQ - Extended Signal Quality	103
3.2.15.	AT+WS46 - PCCA STD-101 Select Wireless Network	106
3.2.16.	AT+CEDRXS - eDRX Setting	108
3.2.17.	AT+CEDRXRDP - eDRX Read Dynamic Parameters	111
3.2.18.	AT+CEREG - EPS Network Registration Status	113
3.2.19.	AT#RFSTS - Read Current Network Status	116
3.2.20.	AT#CEDRXS - Extended eDRX Setting	118
3.2.21.	AT#MONI - Cell Monitor	123
3.2.22.	AT+CRCES - Reading Coverage Enhancement Status	126
3.2.23.	AT#IOTBND - CAT-M1 & NB-IoT Band Setting	128
3.3.	SIM	130
3.3.1.	AT+CPIN - Enter the PIN	130
3.3.2.	AT+CCID - Read ICCID	134
3.3.3.	AT+CIMI - International Mobile Subscriber Identity (IMSI)	135
3.3.4.	AT#CCID - Read ICCID	136
3.3.5.	AT+CSIM - Generic SIM Access	137
3.3.6.	AT+CCHO - Open Logical Channel	140
3.3.7.	AT+CCHC - Close Logical Channel	142
3.3.8.	AT+ICCID - Read ICCID	143
3.4.	SMS & CB	144
3.4.1.	AT+CSMS - Select Message Service	144
3.4.2.	AT+CPMS - Preferred Message Storage	147
3.4.3.	AT+CMGF - Message Format	150
3.4.4.	AT+CSCA - Service Center Address	151
3.4.5.	AT+CSMP - Set Text Mode Parameters	153
3.4.6.	AT+CSDH - Show Text Mode Parameters	155
3.4.7.	AT+CSAS - Save Settings	157
3.4.8.	AT+CRES - Restore Settings	158
3.4.9.	AT+CMMS - More Message to Send	160
3.4.10.	AT+CNMI - New Message Indications to Terminal Equipment	162
3.4.11.	AT+CNMA - New Message Acknowledgement	170
3.4.12.	AT+CMGL - List Messages	175
3.4.13.	AT+CMGR - Read Message	180
3.4.14.	AT+CMGS - Send Short Message	186
3.4.15.	AT+CMSS - Send Message from Storage	191
3.4.16.	AT+CMGW - Write Short Message to Memory	193

3.4.17.	AT+CMGD - Delete Message	199
3.4.18.	AT+CGSMS - Select Service for MO SMS Messages	201
3.5.	Phonebook	203
3.5.1.	AT+CPBS - Select Phonebook Memory Storage	203
3.5.2.	AT+CPBR - Read Phonebook Entries	206
3.5.3.	AT+CPBF - Find Phonebook Entries	210
3.5.4.	AT+CPBW - Write Phonebook Entry	214
3.6.	Time & Alarm	218
3.6.1.	AT+CCLK - Clock Management	218
3.6.2.	AT+CTZR - Time Zone Reporting	220
3.6.3.	AT+CTZU - Automatic Time Zone Update	222
3.7.	HW and Radio Control	223
3.7.1.	AT#GPIO - General Purpose Input/Output Pin Control	223
3.8.	Easy Scan	228
3.8.1.	AT#CSURV - Network Survey	228
3.8.2.	AT#CSURVF - Network Survey Format	231
3.9.	Packet Domain	233
3.9.1.	AT+CGDCONT - Define PDP Context	233
3.9.2.	AT+CGPADDR - Show PDP Address	237
3.9.3.	AT+CGAUTH - Define PDP Context Authentication Parameters	239
3.9.4.	AT+CGCONTRDP - PDP Context Read Dynamic Parameters	241
3.9.5.	AT+CGPIAF - Printing IP Address Format	244
3.9.6.	AT+CGEREP - Packet Domain Event Reporting	247
3.9.7.	AT+CGREG - GPRS Network Registration Status	249
3.9.8.	AT+CGATT - PS Attach or Detach	253
3.9.9.	AT+CSODCP - Sending of Originating Data Via the Control Plane	255
3.9.10.	AT+CRTDCP - Reporting of Terminating Data Via the Control Plane	257
3.10.	IPEasy	259
3.10.1.	AT#SGACT - Context Activation	259
3.10.2.	AT#SCFG - Socket Configuration	262
3.10.3.	AT#SCFGEXT - Socket Configuration Extended	265
3.10.4.	AT#SCFGEXT2 - Socket Configuration Extended 2	269
3.10.5.	AT#SKTRST - Socket Parameters Reset	274
3.10.6.	AT#SD - Socket Dial	275
3.10.7.	AT#SO - Socket Restore	279
3.10.8.	AT#SH - Socket Shutdown	280
3.10.9.	AT#SL - Socket Listen	281

3.10.10.	AT#SLUDP - Socket Listen UDP	283
3.10.11.	AT#SA - Socket Accept	286
3.10.12.	AT#SSEND - Send Data in Command Mode	288
3.10.13.	AT#SSENDEXT - Send Data in Command Mode extended	290
3.10.14.	AT#SRECV - Socket Receive Data in Command Mode	293
3.10.15.	AT#SSENDUDP - Send UDP Data to a Specific Remote Host	295
3.10.16.	AT#SSENDUDPEXT - Send UDP Data to a Specific Remote Host EXTENDED	299
3.10.17.	AT#SLASTCLOSURE - Detect the Cause of a Socket Disconnection	301
3.10.18.	AT#SS - Socket Status	304
3.10.19.	AT#SI - Socket Info	307
3.10.20.	AT#ST - Socket Type	310
3.10.21.	AT#PING - Send PING Request	313
3.10.22.	AT#SCFGEXT3 - Socket Configuration Extended 3	316
3.11.	FTPEasy	319
3.11.1.	AT#FTPAPP - FTP Append	319
3.11.2.	AT#FTPAPPEXT - FTP Append Extended	321
3.11.3.	AT#FTPCLOSE - FTP Close Command	324
3.11.4.	AT#FTPCMD - FTP Send Commands	325
3.11.5.	AT#FTPCWD - FTP Change Working Directory	328
3.11.6.	AT#FTPDELE - FTP Delete	329
3.11.7.	AT#FTPGET - FTP Get Command	330
3.11.8.	AT#FTPGETPKT - FTP Get in Command Mode	331
3.11.9.	AT#FTPLIST - FTP List	333
3.11.10.	AT#FTPMSG - FTP Read Message	334
3.11.11.	AT#FTPOPEN - FTP Connection Opening	335
3.11.12.	AT#FTPPUT - FTP Send File	337
3.11.13.	AT#FTPPWD - FTP Print Working Directory	339
3.11.14.	AT#FTPRECV - Receive Data in Command Mode	340
3.11.15.	AT#FTPREST - Set Restart Position for FTP GET	343
3.11.16.	AT#FTPTO - FTP Time Out	345
3.11.17.	AT#FTPTYPE - FTP Type	346
3.11.18.	AT#FTPCFG - FTP Configuration	348
3.12.	HTTP	350
3.12.1.	AT#HTTPCFG - Configure HTTP Parameters	350
3.12.2.	AT#HTTPQRY - Send HTTP GET, HEAD or DELETE Request	354
3.12.3.	AT#HTTPSND - Send HTTP POST or PUT request	357

3.12.4.	AT#HTTTPRCV - Receive HTTP Server Data	361
3.13.	CloT Optimization	363
3.13.1.	AT+CCIOTOPT - CloT Optimization Configuration	363
3.14.	MQTT	366
3.14.1.	AT#MQEN - Enable MQTT Feature	366
3.14.2.	AT#MQCFG - Configure MQTT Parameters	368
3.14.3.	AT#MQDISC - Log Out and Disconnect from the MQTT Broker	371
3.14.4.	AT#MQCONN - Connect and Log in the MQTT Broker	372
3.14.5.	AT#MQCFG2 - Configure Additional MQTT Parameters	375
3.14.6.	AT#MQWCFG - Configure MQTT Last Will and Testament	377
3.14.7.	AT#MQTCFG - Configure Timeout Parameters for MQTT Transmission	380
3.14.8.	AT#MQUNS - Unsubscribe from a Topic	382
3.14.9.	AT#MQSUB - Subscribe to a Topic	383
3.14.10.	AT#MQPUBS - Publish ASCII String	385
3.14.11.	AT#MQREAD - Read Messages Received from the MQTT Broker	387
3.15.	PSM (Power Saving Mode)	390
3.15.1.	AT+CPSMS - Power Saving Mode Setting	390
3.15.2.	AT#CPSMS - Power Saving Mode Setting	395
3.15.3.	AT#PSMURC - Power Saving Mode URC	398
3.16.	Debugging	400
3.16.1.	AT#TRACE - Enable/Disable Trace	400
4.	PRODUCT AND SAFETY INFORMATION	405
4.1.	Copyrights and Other Notices	405
4.1.1.	Copyrights	405
4.1.2.	Computer Software Copyrights	405
4.2.	Usage and Disclosure Restrictions	406
4.2.1.	License Agreements	406
4.2.2.	Copyrighted Materials	406
4.2.3.	High Risk Materials	406
4.2.4.	Trademarks	406
4.2.5.	3rd Party Rights	407
4.2.6.	Waiver of Liability	407
4.3.	Safety Recommendations	407
5.	GLOSSARY	409
6.	DOCUMENT HISTORY	412

1. INTRODUCTION

1.1. Scope

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

1.2. Audience

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

1.3. Contact Information, Support

For general contacts, technical support services, technical questions and report of documentation errors, contact Telit Technical Support at:

1. TS-EMEA@telit.com
2. TS-AMERICAS@telit.com
3. TS-APAC@telit.com
4. TS-SRD@telit.com
5. TS-ONEEDGE@telit.com

Alternatively, use:

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

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<https://www.telit.com/>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates the user feedback on our information

1.4. Symbol Convention



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



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



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



Note/Tip: Provides other advices and suggestions.



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



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



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



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



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



Additional info: This section provides any kind of additional and useful information related to the AT command section as well as command exceptions or special behavior cases



Reference: This section provides useful references (standards or normative) related to the AT command involved.



Example: This section provides useful examples related to the AT command involved.

Table 1: Symbol Conventions

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

2. COMMANDS

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

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

Moreover, the Telit family of wireless modules also supports Telit's proprietary AT commands for special purposes.

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



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

2.1. Definitions

The following syntactic definitions apply:

- <CR> **Carriage return character**, is the command line and terminator character of the result code, whose value, in decimal ASCII between 0 and 255, is specified within the parameter **S3**. The default value is 13.
- <LF> **Linefeed character**, is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter **S4**. The default value is 10. The line feed character is output after the carriage return character if detailed result codes are used (**V1** option used) otherwise, if numeric format result codes are used (**V0** option used) it will not appear in the result codes.
- <...> Name enclosed in angle brackets is a syntactic element. They are not displayed on the command line.
- [...] The optional sub parameter of a command or an optional part of the TA information response is enclosed in square brackets. The brackets themselves are not displayed on the command line. When the sub parameter is not given in AT

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

2.2. AT Command Syntax

The syntax rules followed by Telit implementation of either Hayes AT commands, GSM commands are very similar to those of standard basic and extended AT commands

There are two types of extended command:

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

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

Moreover:

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



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

2.2.1. String Type Parameters

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

A string is always case-sensitive.

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

2.2.2. Command Lines

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

The **command line prefix** consists of the characters "AT" or "at", or, to repeat the execution of the previous command line, the characters "A/" or "a/" or **AT#/#** or **at#/#**.

The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.

The basic structures of the command line are:

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



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.

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

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

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

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

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

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

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

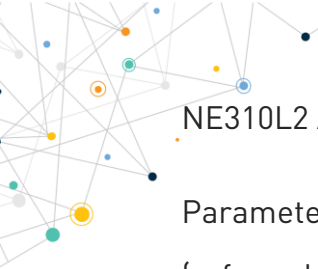


Note: The command line buffer accepts a maximum of 400 characters. If this number is exceeded, none of the commands will be executed and TA returns **ERROR**.

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

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

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



Parameter: **<err>** - error code can be either numeric or detailed (see **+CMEE**).
(refer subclause 9.1 of 3GPP 27.007 Rev14).

<err> values (numeric format followed by verbose format):

All values below 256 are reserved.

Values in the range 0 - 100 are reserved for general errors.

Values in the range 101 - 150 are reserved for use by GPRS and EPS.

Values in the range 151 - 170 are reserved for use by VBS/VGCS and eMLPP.

Values in the range 171 - 256 can be used by GPRS or by EPS.

2.2.2.2. Message Service Failure Result Code - +CMS ERROR: <err>

This is NOT a command; it is the error response to +Cxxx 3GPP TS 27.005 commands.

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

Parameter: **<err>** - numeric error code.

2.2.3. Information Responses and Result Codes

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

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

Moreover, there are two other types of result codes:

1. *result codes* that inform about the progress of the TA operation (e.g. connection establishment **CONNECT**)
2. *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

Numeric form	Verbose form
0	OK
1	CONNECT or CONNECT <text>

2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER
10	CONNECT 2400
11	CONNECT 4800
12	CONNECT 9600
15	CONNECT 14400
23	CONNECT 1200/75

Table 2: basic result codes



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

2.2.4. Command Response Time-Out

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

2.2.5. Command Issuing Timing

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

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



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

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



Warning: references to Cat. M1 and/or GSM can be found in AT Commands descriptions: they are there only for backward compatibility.

NB-IoT, Cat. M1 and GSM parameters are valid only on products that support these technologies.

3. AT COMMANDS REFERENCES

3.1. General Control and Config

3.1.1. Generic Modem Control

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

Set configuration parameters to default values.



ITU-T Recommendation V.25 ter

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



AT&F[<value>]

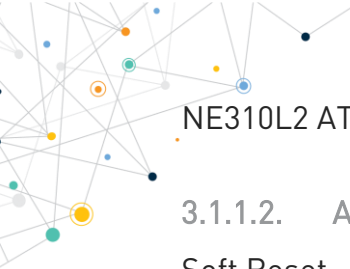
Execution command sets the configuration parameters to default values specified by manufacturer; it takes in consideration hardware configuration switches and other manufacturer-defined criteria.

Parameter:

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

Value:

0 : only the factory profile base section parameters are considered



3.1.1.2. ATZ - Soft Reset

Soft Reset



ITU-T Recommendation V.25 ter

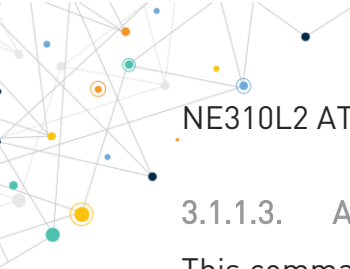
SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2



ATZ

Execution command sets all parameters to their defaults as specified by a user memory profile or by the manufacturer and resets device

- Reset device but doesn't return values to factory default.



3.1.1.3. AT+GCAP - Capabilities List

This command returns the equipment supported command set list.



ITU-T Recommendation V.25 ter

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



AT+GCAP

Execution command returns the equipment supported command set list:

+GCAP: +CGSM

Additional info:

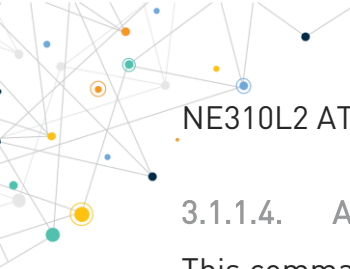
▶▶ Supported Command Set:

+CGSM: GSM ETSI command set



AT+GCAP=?

Test command returns **OK** result code.



3.1.1.4. AT+GMI - Manufacturer Identification

This command returns the manufacturer identification.



ITU-T Recommendation V.25 ter

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



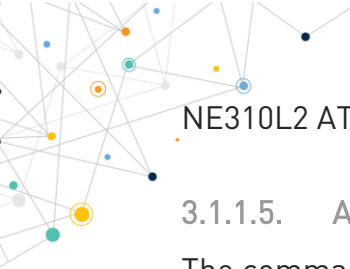
AT+GMI

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



AT+GMI=?

Test command returns **OK** result code.



3.1.1.5. AT+GMM - Model Identification

The command returns the model identification.



ITU-T Recommendation V.25 ter

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



AT+GMM

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



AT+GMM=?

Test command returns **OK** result code.

3.1.1.6. AT+GMR - Revision Identification

The command returns the software revision identification.



ITU-T Recommendation V.25 ter

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



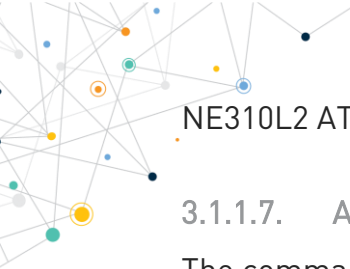
AT+GMR

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



AT+GMR=?

Test command returns **OK** result code.



3.1.1.7. AT+GSN - Serial Number

The command reports the device board serial number.



ITU-T Recommendation V.25 ter

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



AT+GSN

Execution command returns the device board serial number.

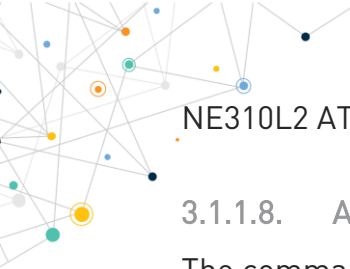


The number returned is not the IMSI, but it is the board number.



AT+GSN=?

Test command returns **OK** result code.



3.1.1.8. AT+CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.



3GPP TS 27.007

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



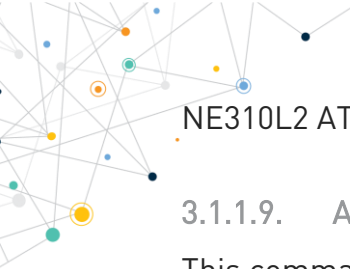
AT+CGMI

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



AT+CGMI=?

Test command returns **OK** result code.



3.1.1.9. AT+CGMM - Request Model Identification

This command returns the device model identification.



3GPP TS 27.007

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



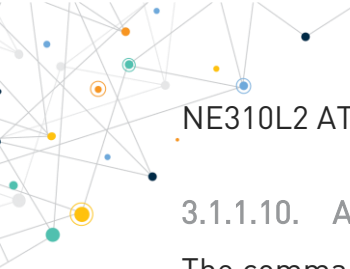
AT+CGMM

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



AT+CGMM=?

Test command returns **OK** result code.



3.1.1.10. AT+CGMR - Request Revision Identification

The command returns device software revision number.



3GPP TS 27.007

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



AT+CGMR

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



AT+CGMR=?

Test command returns **OK** result code.



3.1.1.11. AT+CGSN - Request Product Serial Number Identification

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



3GPP TS 27.007

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



AT+CGSN

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

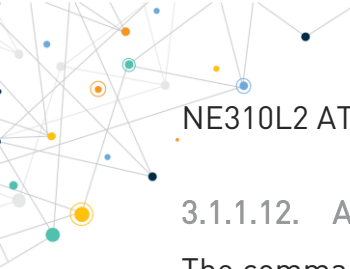
Additional info:

- ▶▶ 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.



3.1.1.12. AT#CGMI - Request Manufacturer Identification

The command returns device manufacturer identification code.

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



AT#CGMI

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

The response is as follows

#CGMI: *<code>*

OK



AT#CGMI=?

Test command returns **OK** result code.



3.1.1.13. AT#CGMR - Request Revision Identification

The command returns device software revision number.

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

AT#CGMR

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

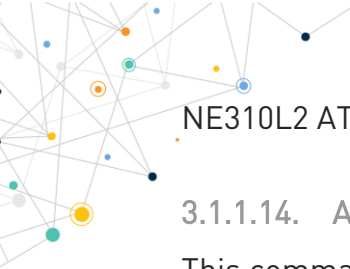
The response is as follows

#CGMR: <num>

OK

AT#CGMR=?

Test command returns **OK** result code.



3.1.1.14. 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	MAX timeout	SELINT
Not required	No	No	-	2



AT#SWPKGV=<version>

Here is the set format.

Parameter:

Name	Type	Default	Description
<version>	string	N/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.

3.1.1.15. AT+CFUN - Set Phone Functionality

This command selects the level of functionality in the ME.



3GPP TS 27.007

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


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

Set command selects the level of functionality in the ME.

Parameters:

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

Values:

- 0 : NON-CYCLIC SLEEP mode, see Additional info section
- 1 : mobile full functionality with power saving disabled
- 2 : disable TX, not supported
- 4 : disable both TX and RX
- 5 : 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 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.

- i** 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 comes during the power save, then the module will wake up and proceed normally with the unsolicited incoming call code.



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>**.

3.1.1.16. AT+CLAC - Available AT Commands

This command shows the available AT commands list.



3GPP TS 27.007

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



AT+CLAC

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

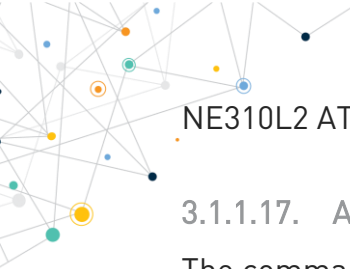
<ATcmd1>[<CR><LF><ATcmd2>[...]]

<ATcmdn> is the AT command.



AT+CLAC=?

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



3.1.1.17. AT+CMEE - Report Mobile Equipment Error

The command enables the use of result code.



3GPP TS 27.007

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



AT+CMEE=[<n>]

Set command disables/enables the use of result code **+CME ERROR: <err>** as an indication of an error relating to the **+Cxxx** command issued. When enabled, device related errors cause the **+CME ERROR: <err>** final result code instead of the default **ERROR** final result code. **ERROR** is returned normally when the error message is related to syntax, invalid parameters or DTE functionality.

Parameter:

Name	Type	Default	Description
<n>	integer	0	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

- i** The detailed description of <err> is available in section "ME Error Result Code - +CME ERROR: <err>".
- i** **+CMEE** has no effect on the final result code **+CMS**.

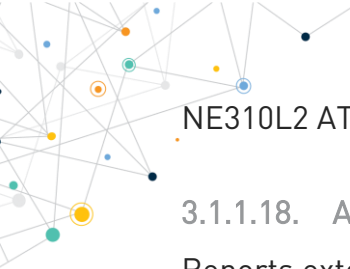
**AT+CMEE?**

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>.



3.1.1.18. AT+CEER - Extended Error Report

Reports extended error related to the last unsuccessful call.



3GPP TS 27.007

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



AT+CEER

Execution command returns one or more lines of information text **<report>** offering the TA user an extended error report, in the format:

+CEER: <report>

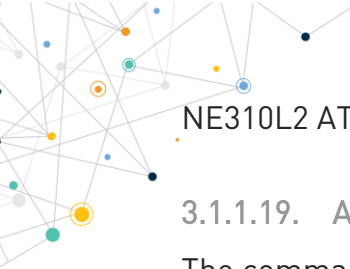
This report regards some error condition that may occur:
the failure in the last unsuccessful call setup (originating or answering)
the last call release

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



AT+CEER=?

Test command returns **OK** result code.



3.1.1.19. 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	MAX timeout	SELINT
Required	Specific profile	No	-	2



AT+CSCS=[<chset>]

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

Parameter:

Name	Type	Default	Description
<chset>	string	8859-1	character set to be used by the device.

Values:

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 them to hexadecimal numbers (i.e. no SMS style packing of 7 bit alphabet).



AT+CSCS?

Read command returns the current value of the active character set.



AT+CSCS=?

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



3.1.1.20. 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	MAX timeout	SELINT
Not required	No	No	-	2



AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]

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

Parameters:

Name	Type	Default	Description
<mode>	integer	0	basic option is currently the only supported mode.
	Value:		0 : basic option mode.
<subset>	integer	0	the way in which the multiplexer control channel is set up
	Value:		0 : UIH frame
<port_speed>	integer	N/A	transmission rate. The default value is implementation specific.
	Values:		1 : 9600 bps 2 : 19200 bps



- 3 : 38400 bps
- 4 : 57600 bps
- 5 : 115200 bps
- 6 : 230400 bps

<N1>	integer	122	maximum frame size.
Value:			
1÷1500 : expressed in bytes			

<T1>	integer	10	acknowledgement timer in units of ten milliseconds
Value:			
1÷255 : in units of ten milliseconds			


<N2>	integer	3	maximum number of re-transmissions
Value:			
0÷100 : range of re-transmissions number			

<T2>	integer	30	response timer for the multiplexer control channel. T2 must be longer than T1.
Value:			
2÷255 : in units of ten milliseconds			

<T3>	integer	10	wake up response timer
Value:			
1÷255 : in seconds			

<k>	integer	2	window size, for Advanced option with Error-Recovery Mode
Value:			
1÷7 : window size range			



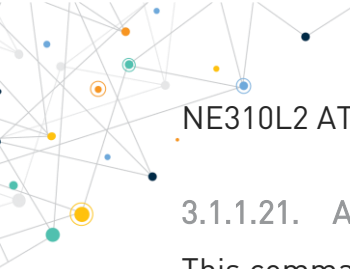
 **AT+CMUX?**

Read command returns the current value of the parameters, in the format:

+CMUX: <mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k>

 **AT+CMUX=?**

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



3.1.1.21. 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 User's Guide of the used module

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



AT#PORTCFG=<Variant>

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

Parameter:

Name	Type	Default	Description
<Variant>	integer	0	set port configuration. A short description, for each <Variant> value, is reported in test command section.

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

Name	Type	Default	Description
<requested>	integer	-	value showing the requested configuration that will be activated at the next power ON.
<active>	integer	-	value showing the current 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, USIF1, etc.) and a Service Access Point (AT#1, AT#2, etc.). To have information about the physical ports, refer to document [1].

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

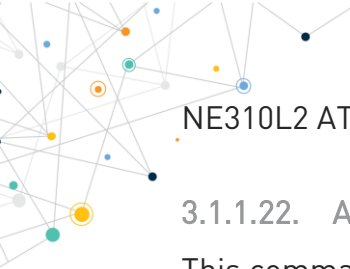
AT#PORTCFG=?

#PORTCFG: Variant=0: AT= USIF0 Trace= NONE; Modem Trace= NONE

#PORTCFG: Variant=3: AT= USIF0 Trace= NONE; Modem Trace= USIF1

#PORTCFG: Variant=8: AT= USIF0 Trace= USIF1; Modem Trace= NONE

OK



3.1.1.22. AT#CGMM - Request Model Identification

This command returns the device model identification.

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



AT#CGMM

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

```

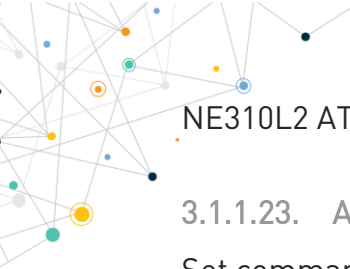
AT#CGMM
#CGMM: <code>
OK

```



AT#CGMM=?

Test command returns **OK** result code.



3.1.1.23. 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	MAX timeout	SELINT
Not required	Auto	No	-	2

AT#FWSWITCH=<imageNumber>[,<reboot>]

Parameters:

Name	Type	Default	Description
<imageNumber>	integer	-	To know the <imageNumber> values range refer to the test command. For the relation between <imageNumber> value and the relative customization refer to the table in Additional info section where are also described the default values.
<reboot>	integer	0	Reboot mode

Values:

- 0 : Reboot the module after the network selection
- 1 : Do not reboot the module

Additional info:

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

Product	Customization	<reboot> default value
---------	---------------	------------------------



NE310L2-W1	0 = AT&T, 1 = Verizon, 2 = Default	0
NE310L2-WW	0 = AT&T, 1 = Verizon, 2 = Default	0



AT#FWSWITCH?

Read command reports the current active firmware image:

#FWSWITCH: <imageNumber>

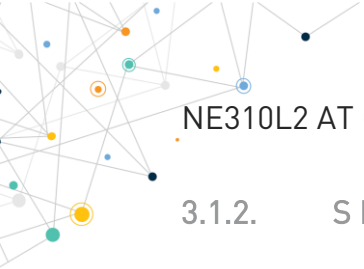


AT#FWSWITCH=?

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



Switch to image 1:
AT#FWSWITCH =1
OK



3.1.2. S Parameters

3.1.2.1. ATS2 - Escape Character

The command manages the ASCII character used as escape character.

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



ATS2=<char>

Set command sets the ASCII character to be used as escape character.

Parameter:

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

<char>	integer	43	escape character decimal ASCII
--------	---------	----	--------------------------------

Value:

0÷255 : factory default value is '+'

- The escape sequence consists of three escape characters preceded and followed by **n** ms of idle.



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.



ATS2=?

Test command returns **OK** result code.

3.1.3. DTE - Modem Interface Control

3.1.3.1. ATE - Command Echo

This command allows to enable or disable the command echo.



ITU-T Recommendation V.25 ter

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



ATE[<n>]

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

Parameter:

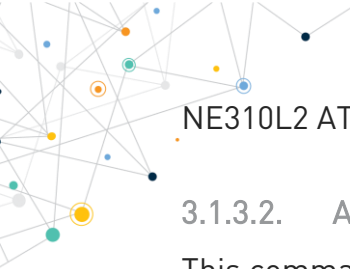
Name	Type	Default	Description
<n>	integer	1	Configuration value

Values:

0 : disables command echo

1 : enables command echo, hence command sent to the device are echoed back to the DTE before the response is given.

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



3.1.3.2. ATQ - Quiet Result Codes

This command allows to enable or disable the result code.



ITU-T Recommendation V.25 ter

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



ATQ[<n>]

Set command enables or disables the result codes.

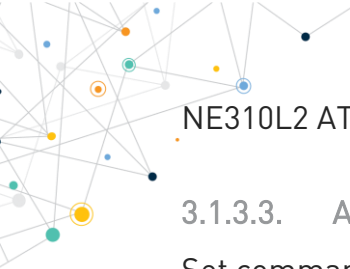
Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables result codes

Values:

- 0 : enables result codes
- 1 : disables result codes. The commands entered after ATQ1 do not return the result code.
- 2 : disables result codes (only for backward compatibility). The commands entered after ATQ2 do not return the result code.

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



3.1.3.3. 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	MAX timeout	SELINT
Not required	Specific profile	No	-	2



ATV[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	1	format of information responses and result codes. See Additional info section.

Values:

- 0 : limited headers and trailers and numeric format of result codes
- 1 : full headers and trailers and verbose format of result codes

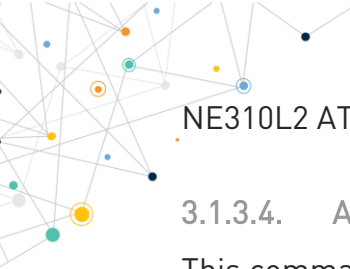
Additional info:

<n>=0	
information responses	<text><CR><LF>
result codes	<numericCode><CR>
<n>=1	
information responses	<CR><LF> <text><CR><LF>



result codes	<CR><LF> <verboseCode><CR><LF>
--------------	-----------------------------------

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



3.1.3.4. ATI - Identification Information

This command returns identification information.



ITU-T Recommendation V.25 ter

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



ATI[<n>]

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

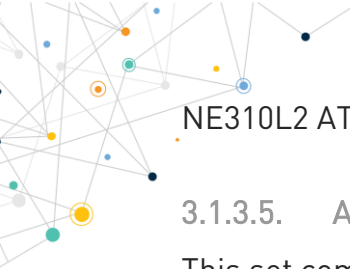
Parameter:

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

i If parameter is omitted, the command has the same behavior of ATIO



3.1.3.5. 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	MAX timeout	SELINT
Not required	No	No	-	2



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

i If parameter is omitted, the command has the same behavior of **AT&C0**



3.1.3.6. 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	MAX timeout	SELINT
Not required	Specific profile	No	-	2



AT&D[<n>]

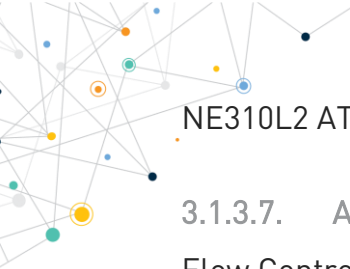
Parameter:

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

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



3.1.3.7. AT&K - Flow Control

Flow Control settings.

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



AT&K[<n>]

Set command controls the serial port flow control behavior.

Parameter:

Name	Type	Default	Description
<n>	integer	0	flow control behavior

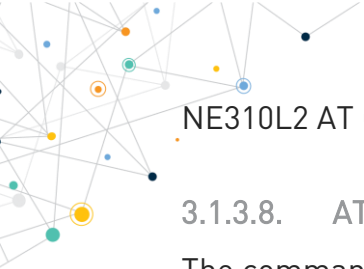
Values:

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



3.1.3.8. AT+IPR - UART DCE Interface Data Rate Speed

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



[1] Hardware User's Guide of the used module

[2] ITU-T Recommendation V25 ter

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



AT+IPR=<rate>

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:

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



3.1.3.9. AT+IFC - DTE-Modem Local Flow Control

This set command selects the flow control of the serial port in both directions.



ITU-T Recommendation V25 ter

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

**AT+IFC=<byDTE>,<byDCE>**

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



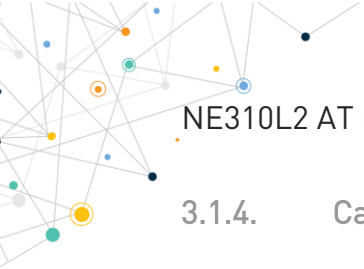
The only possible commands are **AT+IFC=0,0** and **AT+IFC=2,2**.

 **AT+IFC?**

Read command returns active flow control settings.

 **AT+IFC=?**

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



3.1.4. Call (Voice and Data) Control

3.1.4.1. ATD - Dialup Connection

This command establishes a dialup connection between the TE and the external PDN.



3GPP TS 27.007

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



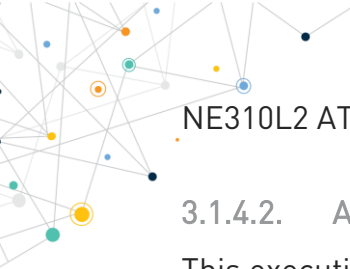
ATD

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.

Additional info:

▶▶ **ATD*`<gprs_sc>`[*[*[*`<cid>`]]]]#**

Name	Type	Default	Description
<code><gprs_sc></code>	integer	N/A	is the GPRS Service Code, which identifies a request to use the GPRS communication
Value:			
	99	:	GPRS Service Code
<code><cid></code>	integer	-	PDP context definition, see +CGDCONT command



3.1.4.2. ATO - Return to ON-Line Mode

This execution command is used, during a suspended data conversation, to return in on-line mode from command mode. If there is no suspended conversation, it returns **NO CARRIER**.



ITU-T Recommendation V. 25 ter

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



ATO

- i** 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**.



3.2. Network

3.2.1. 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	MAX timeout	SELINT
Required	No	No	-	2



AT+CNUM

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

3.2.2. AT+COPN - Read Operator Names

This command read operator names.



3GPP TS 27.007

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



AT+COPN

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

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

+COPN: <numeric2>,<alpha2>[...]]

The parameters are described in the Additional info section.


Additional info:

- ▶▶ List of the parameters meaning.

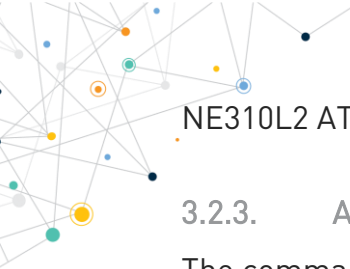
Name	Type	Default	Description
<numeric>	string	-	operator in numeric format, see +COPS.
<alphan>	string	-	operator in long alphanumeric format, see +COPS.

- ⓘ Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the ME memory is returned.



 **AT+COPN=?**

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



3.2.3. AT+CREG - Network Registration Status

The command enables/disables the network registration unsolicited result code (URC) and selects its presentation format.



3GPP TS 27.007

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



AT+CREG=[<mode>]

Set command enables/disables the network registration unsolicited result code and selects one of the two available formats:

short format: **+CREG: <stat>**

long format: **+CREG: <stat>[,<lac>,<ci>[,<AcT>]]**

The parameter meanings are shown in Unsolicited code value section.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables/disables the network registration unsolicited result code and selects one of the two formats: 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: 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 : out of coverage 5 : registered, roaming
<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: 0 : GSM 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



3.2.4. AT+COPS - Operator Selection

The command selects a network operator and registers the module.



3GPP TS 27.007

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



AT+COPS=[<mode>[,<format>[,<oper>[,<act>]]]]

The set command attempts to select a network operator and registers the module on the just chosen operator; the selection can be automatic or manual.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	defines the operator selection: automatic or manual.
<format>	integer	0	specifies the operator name format, see <oper> parameter

Values:

- 0 : automatic selection, the parameter <oper> is ignored
- 1 : manual selection, the parameter <oper> must be present
- 2 : deregister from network. The module is unregistered until a +COPS with <mode>=0, 1 or 4 is issued
- 3 : set only <format> parameter, the parameter <oper> is ignored
- 4 : manual/automatic, <oper> parameter must be present. If manual selection fails, the module will try automatic mode (<mode>=0)

Values:

- 0 : alphanumeric long form (max length 16 digits)
- 1 : alphanumeric short form
- 2 : numeric 5 or 6 digits [country code (3) + network code (2 or 3)]

<oper>	mixed	-	network operator in format defined by <format> parameter
<act>	integer	N/A	selects access technology.

Values:

- 0 : GSM
- 8 : CAT M1
- 9 : NB IoT

- i** **<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).
- i** **<format>** parameter setting is never stored in NVM.
- i** 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.

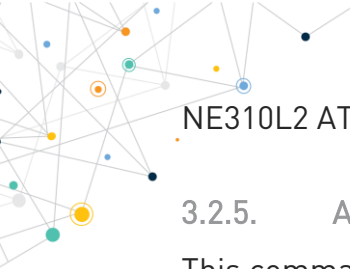
Additional info:

- ▶▶ 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.





3.2.5. 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	MAX timeout	SELINT
Not required	No	No	-	2



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:			
"SC"	:	SIM (PIN request)	(device asks SIM password at power-up and when this lock command issued)
"PN"	:	Network Personalization	
"PU"	:	network sUbsset Personalization	
"PS"	:	PS lock	
<mode>	integer	N/A	defines the operation to be done on the facility
Values:			
0	:	unlock facility	
1	:	lock facility	

2 : query status

<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).

Values:

- 1 : voice (telephony)
- 2 : data (refers to all bearer services)
- 4 : fax (facsimile services) (not supported by LTE)
- 8 : short message service
- 16 : data circuit sync
- 32 : data circuit async
- 64 : dedicated packet access
- 128 : dedicated PAD access

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:

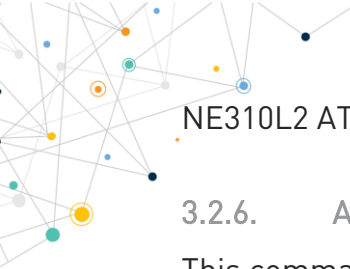
- 0 : not active



1 : active

 **AT+CLCK=?**

Test command reports all the facilities supported by the device.



3.2.6. 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	MAX timeout	SELINT
Required	Other	Yes	180 s	2



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

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

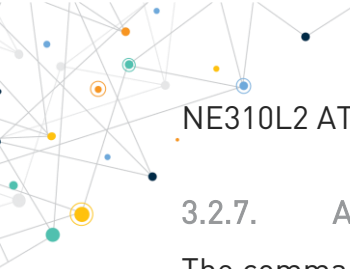
Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility lock function.
Values:			
	"SC"	:	SIM (PIN request)
	"P2"	:	SIM PIN2
	"PN"	:	Network Personalization
	"PU"	:	network sUbsset Personalization
	"PS"	:	PS lock
<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.

-
- i** Parameter **<oldpwd>** is the old password while **<newpwd>** is the new one.
 - i** 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>**).



3.2.7. AT+CPOL - Preferred Operator List

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



3GPP TS 27.007

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

**AT+CPOL=[<index>]**

[,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<E_UTRAN_AcTn>]]]

Execution command writes an entry in the 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

-
- i** If <index> is used, and <oper> is not entered, the entry is deleted from the list of preferred operators.
 - i** If <oper> is used, and <index> is not used, <oper> is put in the next free location.
 - i** 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)
```

3.2.8. AT+CPLS - Selection of Preferred PLMN List

The command is used to select a list of preferred PLMNs in the SIM/USIM card.



3GPP TS 27.007

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



AT+CPLS=<list>

Set command select one PLMN selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by +CPOL command.

Parameter:

Name	Type	Default	Description
<list>	integer	0	PLMNs list selector

Values:

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

i The value set by command is directly stored in NVM and doesn't depend on the specific CMUX instance.



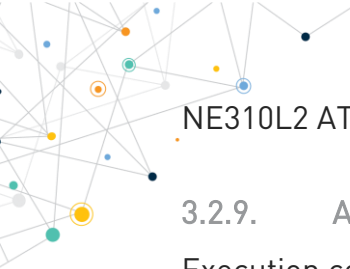
AT+CPLS?

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.



3.2.9. AT+CSQ - Signal Quality

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



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

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



AT+CSQ

See Additional info sections.

Additional info:

- ▶▶ [2G Networks](#)

The execution command returns the following message:

+CSQ: <rssi>,<ber>

Name	Type	Default	Description
<rssi>	integer	N/A	measurements of the radio signal power, expressed in dBm, are mapped to <rssi> as shown below

Values:

- 0 : -113 dBm or less
- 1 : -111 dBm
- 2÷30 : -109 dBm ... -53 dBm; 2 dBm per step
- 31 : -51 dBm or greater

99 : not known or not detectable

<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:

0 : -113 dBm or less



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

<rsrq>	integer	N/A	Reference Signal Received Quality. For <rsrq> levels are mapped to range 0...7.
---------------------	---------	-----	--

Values:

0	:	-4...-3 dB
1	:	-6...-5 dB
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.



3.2.10. AT#BND - Select Band

This command selects RF bands

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

 **AT#BND=<band>[,<UMTS_band>[,<LTE_band>[,<TDSCDMA_band>[,<LTE_band_over_64>]]]]**

Set command selects the current GSM and LTE (NBlot) bands.

Parameters:

Name	Type	Default	Description
<band>	integer	-	GSM band selection.

For 4G only products:

<band>	/
0	dummy parameter

For 4G/2G products supporting GSM 900 MHz, DCS 1800 MHz, PCS 1900 MHz and GSM 850 MHz:

<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
...	...
$[2^{\exp(i-1)}]$	B_i
...	...
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
...	...
$(2^{\exp(i-64-1)})$	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)

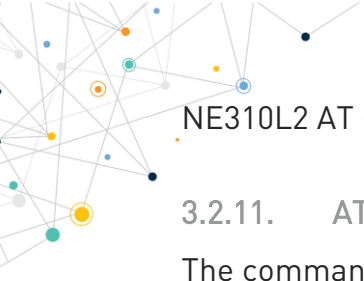
OK

Read command

AT#BND?

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

OK



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

The command is related to extended numeric error report.



3GPP TS 24.008
3GPP TS 24.301

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



AT#CEERNET

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

#CEERNET: <code>

which should offer the user of the TA a report for the last mobility management (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	N/A	error code
--------	---------	-----	------------

Values:



-
- 2 : IMSI unknown in HLR
 - 3 : illegal MS
 - 4 : IMSI unknown in VISITOR LR
 - 5 : IMEI not accepted
 - 6 : illegal ME
 - 7 : GPRS not allowed
 - 8 : Operator determined barring (SM cause failure)/ GPRS and not GPRS not allowed (GMM cause failure)
 - 9 : MS identity cannot be derived by network
 - 10 : implicitly detached
 - 11 : PLMN not allowed
 - 12 : LA not allowed
 - 13 : roaming not allowed
 - 14 : GPRS not allowed in this PLMN
 - 15 : no suitable cells in LA
 - 16 : MSC TEMP not reachable
 - 17 : network failure
 - 20 : MAC failure
 - 21 : SYNCH failure
 - 22 : congestion
 - 23 : GSM authentication unacceptable
 - 24 : MBMS bearer capabilities insufficient for the service
 - 25 : LLC or SMDCP failure
-



-
- 26 : insufficient resources
 - 27 : missing or unknown APN
 - 28 : unknown PDP address or PDP type
 - 29 : user authentication failed
 - 30 : activation rejected by GGSN
 - 31 : activation rejected unspecified
 - 32 : service option not supported
 - 33 : req. service option not subscribed
 - 34 : serv. option temporarily out of order
 - 35 : NSAPI already used
 - 36 : regular deactivation
 - 37 : QOS not accepted
 - 38 : call cannot be identified (MM cause failure) / SMN network failure (SM cause failure)
 - 39 : reactivation required
 - 40 : no PDP context activated (GMM cause failure) / feature not supported (SM cause failure)
 - 41 : semantic error in TFT operation
 - 42 : syntactical error in TFT operation
 - 43 : unknown PDP context
 - 44 : semantic err in PKT filter
 - 45 : syntactical err in PKT filter
 - 46 : PDP context without TFT activated
 - 47 : multicast group membership timeout
-



-
- 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
-

i 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.



3.2.12. AT#CEERTEXT - Extended Error Report for Network Reject Cause

This command is both a set and an execution command.

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

AT#CEERTEXT[=[<func>]]

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

#CEERTEXT: <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 #CEERTEXT URC
- 1 : enable the #CEERTEXT 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	N/A	can assume the following values:
---------------------	---------	-----	----------------------------------

Values:

0	:	#CEERNETEXT URC is disabled
1	:	#CEERNETEXT URC is enabled



 **AT#CEERTEXT=?**

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



3.2.13. 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	MAX timeout	SELINT
Not required	Auto	No	-	2



AT+CEMODE=<mode>

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	mode of operation. The default value depends on product and the support of VoLTE. 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.

Value:

0 : PS mode 2 of operation



AT+CEMODE?

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

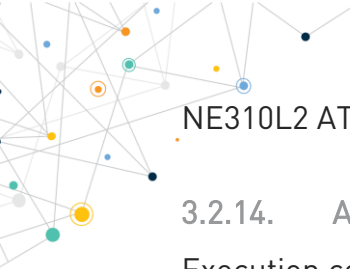
+CEMODE: < mode >



AT+CEMODE=?

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





3.2.14. AT+CESQ - Extended Signal Quality

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



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

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



AT+CESQ

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

Additional info:

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

2G Networks

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

LTE Networks

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

Name	Type	Default	Description
<rxlev>	integer	N/A	received signal strength level, see 3GPP TS 45.008 subclause 8.1.4.



Values:

- 0 : $\text{rssi} < -110 \text{ dBm}$
- 1 : $-110 \text{ dBm} \leq \text{rssi} < -109 \text{ dBm}$
- 2 : $-109 \text{ dBm} \leq \text{rssi} < -108 \text{ dBm}$
- ... : ...
- 61 : $-50 \text{ dBm} \leq \text{rssi} < -49 \text{ dBm}$
- 62 : $-49 \text{ dBm} \leq \text{rssi} < -48 \text{ dBm}$
- 63 : $-48 \text{ dBm} \leq \text{rssi}$
- 99 : not known or not detectable or if the current serving cell is not a GERAN cell

<ber> integer N/A channel bit error rate.

Values:

- 0÷7 : as RXQUAL values, see 3GPP TS 45.008 subclause 8.2.4
- 99 : not known or not detectable or if the current serving cell is not a GERAN cell

<rsrq> integer N/A reference signal received quality, see 3GPP TS 36.133 subclause 9.1.7.

Values:

- 0 : $\text{rsrq} < -19.5 \text{ dB}$
- 1 : $-19.5 \text{ dB} \leq \text{rsrq} < -19.0 \text{ dB}$
- 2 : $-19.0 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$
- ... : ...
- 32 : $-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$
- 33 : $-3.5 \text{ dB} \leq \text{rsrq} < -3 \text{ dB}$



34 : $-3 \text{ dB} \leq \text{rsrq}$

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

<rsrp>	integer	N/A	reference signal received power, see 3GPP TS 36.133 subclause 9.1.4.
--------	---------	-----	--

Values:

0 : $\text{rsrp} < -140 \text{ dBm}$

1 : $-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$

2 : $-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$

... : ...

95 : $-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$

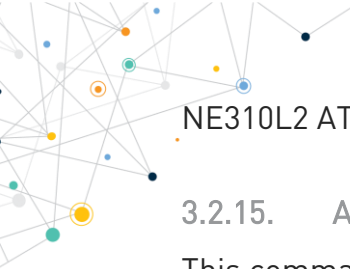
96 : $-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$

97 : $-44 \text{ dBm} \leq \text{rsrp}$

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.



3.2.15. AT+WS46 - PCCA STD-101 Select Wireless Network

This command selects the cellular network (Wireless Data Service, WDS).



3GPP TS 27.007

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



AT+WS46=<n>

Set command selects the cellular network (Wireless Data Service, WDS) to operate with the **TA** (WDS-Side Stack Selection).

Parameter:


Name	Type	Default	Description
<n>	integer	N/A	WDS-Side Stack to be used by the TA . 4G/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>**.



3.2.16. AT+CEDRXS - eDRX Setting

This command controls the setting of the UEs eDRX parameters.



3GPP TS 27.007
3GPP TS 24.008

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



AT+CEDRXS=[<mode>[,<AcTtype>[,<Req_eDRX>]]]

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

Parameters:

Name	Type	Default	Description
<mode>	integer	0	disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcTtype>.

Values:

- 0 : disable the use of eDRX
- 1 : enable the use of eDRX
- 2 : enable the use of eDRX and enable the unsolicited result code, see Additional info.
- 3 : disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values

<AcTtype>	integer	N/A	type of access technology.
-----------	---------	-----	----------------------------

Values:

- 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.
- 5 : E-UTRAN (NB1 mode)

<Req_eDRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008. Default value is "0000".
-------------------------	--------	---	---

Additional info:

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

+CEDRXS:

<AcTtype>[,<Req_eDRX>[,<NW_prove_DRX>[,<PagTimeWindow>]]]

Name	Type	Default	Description
<NW_prove_DRX>	string	-	half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 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?**

Read command returns **OK** result code.

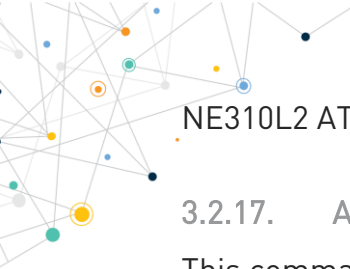
**AT+CEDRXS=?**

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

**AT+CEDRXS=?**

+CEDRXS: (0-3),(5),("0000"- "1111")

OK



3.2.17. AT+CEDRXRDP - eDRX Read Dynamic Parameters

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



3GPP TS 27.007
3GPP TS 24.008

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



AT+CEDRXRDP

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

+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:

0 : access technology is not using eDRX

2 : see +CEDRXS.

4 : see +CEDRXS.

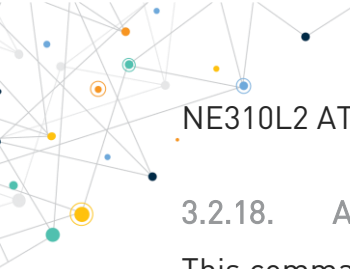


5 : see +CEDRXS.

<Req_eDRX>	string	-	see +CEDRXS.
<NW_prov_eDRX>	string	-	see +CEDRXS.
<PagTimeWindow>	string	-	see +CEDRXS.

?  AT+CEDRXRDP=?

Test command returns **OK** result code.



3.2.18. AT+CEREG - EPS Network Registration Status

This command monitors the Evolved Packet System (EPS) network registration status in LTE.



- [1] 3GPP TS 24.008
- [2] 3GPP TS 24.301
- [3] 3GPP TS 25.331

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



AT+CEREG=[<mode>]

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

short format: **+CEREG: <stat>**

long format: **+CEREG: <stat>[, [<tac>], [<ci>], [<AcT>]]**

<tac>, <ci>, and <AcT> are reported by the command only if available.

In case of error, possible response(s): **+CME ERROR: <err>**

Parameter:

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

Values:

- 0 : disable the network registration unsolicited result code
- 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 : out of 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.

9 : registered for "CSFB not preferred", home network (not applicable).

10 : registered for "CSFB not preferred", roaming (not applicable).

<tac> string tracking area code (two bytes) in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci> string LTE cell ID (four bytes) in hexadecimal format

<AcT> integer indicates the access technology of the serving cell.

Values:

0 : GSM

8 : CAT M1

9 : NB IoT



AT+CEREG?

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

+CEREG: <mode>,<stat>[,<tac>],[<ci>],[<AcT>]



AT+CEREG=?

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

3.2.19. AT#RFSTS - Read Current Network Status

Command reads current network status.

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

AT#RFSTS

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

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
<RSSI>	Received Signal Strength Indication
<RSRQ>	Reference Signal Received Quality
<TAC>	Tracking Area Code
<RAC>	Routing Area Code (dummy)
<TXPWR>	Tx Power (In traffic only) (dummy)
<DRX>	Discontinuous reception cycle Length (cycle length in ms) (dummy)

Parameter/values	Description
<MM>	Mobility Management state (dummy)

Parameters	Description
<RRC>	Radio Resource state
<CID>	Cell ID

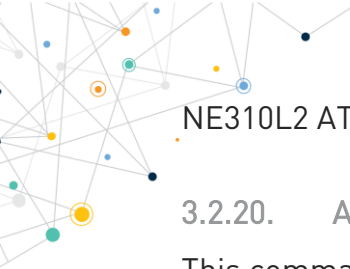
Parameter/values	Description
<IMSI>	International Mobile Station ID
<NetNameAsc>	Operator name, quoted string type
<SD>	Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

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

Parameters	Description
<T3402>	Timer T3402 in seconds (dummy)
<T3412>	Timer T3412 in seconds (dummy)
<SINR>	Signal-to-Interface plus Noise Ratio

? AT#RFSTS=?

Test command tests for command existence.



3.2.20. 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	MAX timeout	SELINT
Required	Auto	No	-	2

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:

- 0 : disable the use of eDRX
- 1 : enable the use of eDRX
- 2 : enable the use of eDRX and enable the unsolicited result code, see Additional info.
- 3 : disable the use of eDRX and discard all parameters for eDRX or, if available,

reset to the manufacturer specific default values

<AcTtype>	integer	N/A	type of access technology.
	Values:		
	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 (A/Gb mode)
	4	:	E-UTRAN (CAT M1 mode)
	5	:	E-UTRAN (NB1 mode)
<Req_eDRX>	string	-	half a byte in a 4 bit format. The eDRX value refers to bit-4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008, Table 10.5.5.32/3GPP TS 24.008. Default value is "0000"
<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
<code><NW_prov_eDRX></code>	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.
<code><NW_prov_PagTimeWindow></code>	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
Values:			
0 : eDRX disabled			
1 : eDRX enabled			

- ▶▶ Meaning of the <eDRX_nw_state> parameter.

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



1 : eDRX enabled

? 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
```



3.2.21. AT#MONI - Cell Monitor

This command is both a set and an execution command.

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

AT#MONI[=[<number>]]

Set command sets the cells from which extract LTE related information.

After entering the set command, enter the execution command **AT#MONI<CR>** to get the LTE related information for the selected cell or cells in the format shown 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:

- ▶▶ LTE network

Name	Type	Default	Description
<number>	integer	0	LTE network

Value:

0 : it is the serving cell

- ▶▶ Execution command **AT#MONI<CR>** reports LTE related information for selected cell.

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

LTE network

#MONI: <netname> RSRP:<rsrp> RSRQ:<rsrq> TAC:<tac> Id:<id>
EARFCN:<earfcn> PWR:<dBm> DRX:<drx> PCI:< physicalCellId >

Name	Type	Default	Description
<netname>	string	-	name of network operator
<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<tac>	integer	-	Tracking Area Code
<id>	integer	-	cell identifier
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<dBm>	integer	-	received signal strength in dBm
<drx>	string	-	Discontinuous reception cycle length (dummy)
<pci>	integer	-	Physical cell identifier

? AT#MONI=?

Test command reports the maximum number of cells from which we can extract information, along with the ordinal number of the current selected cell, in the format:

#MONI: <MaxCellNo>

Additional info:



►► Parameters meaning.

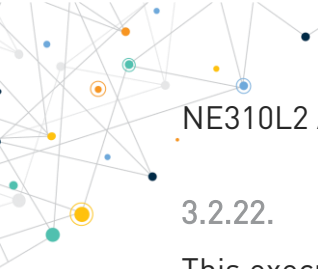
Name	Type	Default	Description
<MaxCellNo>	integer	-	maximum number of cells



Set command selects the cell 0 in the network

```
AT#MONI=0
```

```
OK
```



3.2.22. 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 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	MAX timeout	SELINT
Required	No	No	-	2



AT+CRCES

Additional info:

- ▶▶ The execution command returns the following message.

+CRCES: <AcT>,<CE_level>,<CC>

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



Values:

- 0 : No Coverage Enhancement in the serving cell
- 1 : Coverage Enhancement level 0
- 2 : Coverage Enhancement level 1
- 3 : Coverage Enhancement level 2
- 4 : Coverage Enhancement level 3

<CC>	integer	N/A	Coverage Class (CC) of the MT in the serving cell. Currently not supported.
------	---------	-----	---

Value:

- 0 : No Coverage Class in the serving cell



AT+CRCES=?

Test command returns **OK** result code.

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

Set command configures the NB-IoT bands.

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

➡ `AT#IOTBND=[,<lte_nb1_band_pref.bits_1_64>,<lte_nb1_band_pref.bits_65_128>]`

Parameters:

Name	Type	Default	Description
<code><lte_nb1_band_pref.bits_1_64></code>	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><lte_nb1_band_pref.bits_65_128></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

i The command needs a reboot to be effective.

 **AT#IOTBND?**

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

```
#IOTBND: <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_nb1_band_pref.bits_1_64>,<lte_nb1_band_pref.bits_65_128>
```

3.3. SIM

3.3.1. AT+CPIN - Enter the PIN

The command sends to the device a password which is necessary before it can be operated.



3GPP TS 27.007

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



AT+CPIN=<pin>[,<newpin>]

Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.).

If the PIN required is SIM PUK or SIM PUK2, the <newpin> is required.

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>	string	N/A	PIN/PUK/PUK2 request status code

Values:

READY	:	ME is not pending for any password
SIM PIN	:	ME is waiting SIM PIN to be given
SIM PUK	:	ME is waiting SIM PUK to be given
PH-SIM PIN	:	ME is waiting phone-to-SIM card password to be given
PH-FSIM PIN	:	ME is waiting phone-to-very first SIM card password to be given
PH-FSIM PUK	:	ME is waiting phone-to-very first SIM card unblocking password to be given
SIM PIN2	:	ME is waiting SIM PIN2 to be given; this <code> is returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17)
SIM PUK2	:	ME is waiting SIM PUK2 to be given; this <code> is returned only when the last executed command resulted in PUK2



	authentication failure (i.e. +CME ERROR: 18)
PH-NET PIN	: ME is waiting network personalization password to be given
PH-NET PUK	: ME is waiting network personalization unblocking password to be given
PH-NETSUB PIN	: ME is waiting network subset personalization password to be given
PH-NETSUB PUK	: ME is waiting network subset personalization unblocking password to be given
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

- i** 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=?



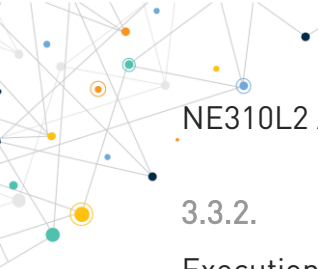
Test command returns **OK** result code.



```
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
```



3.3.2. AT+CCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

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



AT+CCID

The command returns the following message:

```
+CCID: <ICCID>
OK
```



AT+CCID?

Read command returns the following message:

```
+CCID: <ICCID>
OK
```

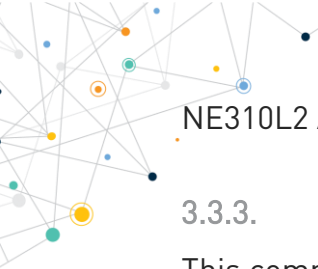


AT+CCID=?

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



```
AT+CCID
+CCID: 89861109091740011006
OK
```



3.3.3. 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	MAX timeout	SELINT
Required	No	No	-	2



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**.

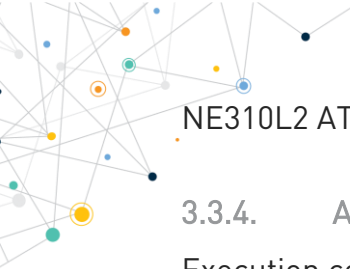


AT+CIMI=?

Test command returns **OK** result code



```
AT+CIMI
22201701202507
OK
```



3.3.4. AT#CCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

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



AT#CCID

The command returns the following message:

```
#CCID: <ICCID>
OK
```



AT#CCID=?

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



```
AT#CCID
#CCID: 89861109091740011006
OK
```




3.3.5. AT+CSIM - Generic SIM Access

This command sends a generic command to the UICC.



- [1] 3GPP TS 11.11
- [2] 3GPP TS 31.101
- [3] 3GPP TS 31.102

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



AT+CSIM=<length>,<command>

Set command transmits to the MT the <command>, it then shall send as it is to the 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



3.3.6. AT+CCHO - Open Logical Channel

Open Logical Channel



3GPP TS 31.101

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



AT+CCHO=<dfname>

Execution of the command causes the MT to return <sessionId> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME.

The currently selected UICC will open a new logical channel; select the application identified by the <dfname> received with this command and return a <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.

- i** 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.

3.3.7. AT+CCHC - Close Logical Channel

Close a communication session.



3GPP TS 31.101

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



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>

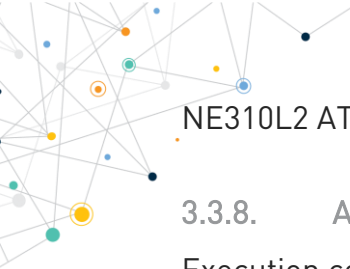
Parameter:

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.



3.3.8. AT+ICCID - Read ICCID

Execution command reads on SIM the Integrated Circuit Card Identification (ICCID). It is the card identification number that provides a unique identification number for the SIM.

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



AT+ICCID

The command returns the following message:

```
+ICCID: <ICCID>
```



AT+ICCID=?

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



```
AT#CCID
#CCID: 89861109091740011006
OK
```



3.4. SMS & CB

3.4.1. 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	MAX timeout	SELINT
Required	Auto	No	-	2



AT+CSMS=[<service>]

Set command selects messaging service <service>. It returns the types of messages supported by the ME:

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

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<service>	integer	0	Select Message Service

Values:

0 : 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005

- 1 : 3GPP TS 23.040 and 3GPP TS 23.041. The syntax of SMS AT commands is compatible with 3GPP TS 27.005. The requirement of <service> setting 1 is mentioned under corresponding command descriptions

Additional info:

- ▶▶ Parameters meaning of the returned message.

Name	Type	Default	Description
<mt>	integer	0	mobile terminated messages support: Values: 0 : type not supported 1 : type supported
<mo>	integer	0	mobile originated messages support Values: 0 : type not supported 1 : type supported
<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>



3.4.2. AT+CPMS - Preferred Message Storage

The command selects the memory storage used by SMs (Short Messages).



3GPP TS 27.005

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



AT+CPMS=<memr>[,<memw>[,<mems>]]

Set command selects memory storages <memr>, <memw> and <mems> to be used for reading, writing, sending and storing SMs

The command returns the memory storage status in the format:

+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>

The returned parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<memr>	string	ME	memory from which messages are read and deleted
Values:			
ME : SMS memory storage in Flash			
SM : SIM SMS memory storage			
<memw>	string	ME	memory to which writing and sending operations are made
Values:			
ME : SMS memory storage in Flash			
SM : SIM SMS memory storage			

<mems> string ME 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>.

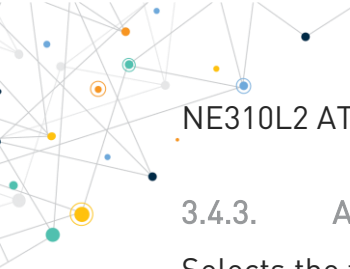
</>

```
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
```



3.4.3. AT+CMGF - Message Format

Selects the format of SMS messages to be used in following SMS commands.



3GPP TS 27.005

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



AT+CMGF=[<mode>]

Set command selects the format of SMS messages used with send, list, read and write commands.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	format to use for SMS operations

Values:

0 : PDU mode

1 : text mode



AT+CMGF?

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

+CMGF: <mode>



AT+CMGF=?

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

3.4.4. AT+CSCA - Service Center Address

This command allows to set the Service Center Address for SMS transmissions.



3GPP TS 27.005

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



AT+CSCA=<number>[,<type>]

Set command sets the Service Center Address to be used for mobile originated SMS transmissions

Parameters:

Name	Type	Default	Description
<number>	string	-	String type phone number of forwarding address in format specified by <type> parameter

<type>	integer	145	The type of number
--------	---------	-----	--------------------

Values:

129 : National numbering scheme

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



AT+CSCA?

Read command reports the current value of the SCA in the format:




+CSCA: <number>,<type>

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

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
```


3.4.5. AT+CSMP - Set Text Mode Parameters

This command is used to select values for additional parameters for storing and sending SMS when the text mode is used (**AT+CMGF=1**).



3GPP TS 27.005
3GPP TS 03.40/23.040
3GPP TS 03.38/23.038

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



AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]

Set command is used to select values for additional parameters for storing and sending SMS when the text mode is used (**AT+CMGF=1**).

Parameters:

Name	Type	Default	Description
<fo>	integer	-	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.
<dcs>	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>,<dcs>
```



AT+CSMP=?

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

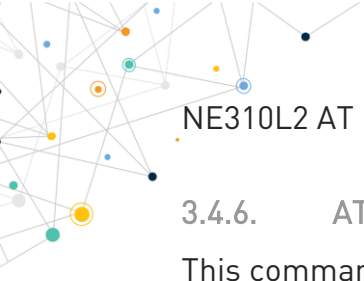


The current settings are stored through **+CSAS**



Set the parameters for an outgoing message with 24 hours of validity period and default properties:

```
AT+CSMP=17,167,0,0  
OK
```



3.4.6. AT+CSDH - Show Text Mode Parameters

This command controls whether detailed header information is shown in text mode.



3GPP TS 27.005

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



AT+CSDH=[<show>]

Set command controls whether detailed header information is shown in text mode (**AT+CMGF=1**) result codes.

Parameter:

Name	Type	Default	Description
<show>	integer	0	control the display of the result codes.

Values:

0 : see Additional info section

1 : show the values in result codes

Additional info:

►► If <show>=0

do not show header values defined in commands **+CSCA** and **+CSMP** (<sca>,<tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in **+CMT**, **+CMGL**, **+CMGR** result codes for SMS-DELIVERS and SMS-SUBMITs in text mode.

For SMS-COMMANDs in **+CMGR** result code do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>



AT+CSDH?

Read command reports the current setting in the format:

+CSDH: <show>



AT+CSDH=?

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



3.4.7. 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	MAX timeout	SELINT
Required	No	No	-	2



AT+CSAS[=<profile>]

Parameter:

Name	Type	Default	Description
<profile>	integer	0	Index of the profile where the settings are saved

Values:

0 : it saves the settings to NVM

1÷n : SIM profile number; the value of <n> depends on the SIM.

- i** Certain settings may not be supported by the SIM and therefore they are always saved to NVM, regardless the value of <profile>.
- i** 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>.

3.4.8. AT+CRES - Restore Settings

Execution command restores message service settings saved by **+CSAS** command from either NVM or SIM.



3GPP TS 27.005

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



AT+CRES[=<profile>]

Parameter:

Name	Type	Default	Description
<profile>	integer	N/A	Defines which message service profiles to restore.

Values:

- 0 : restores message service settings from NVM
- 1÷n : restores message service settings from SIM. The n value depends on the SIM.

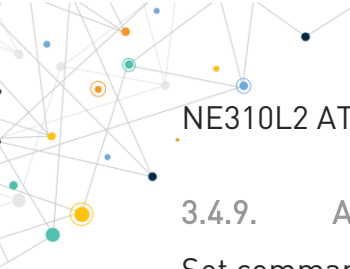
- i** Certain settings may not be supported by the SIM and therefore they are always restored from NVM, regardless the value of **<profile>**
- i** If parameter is omitted the command restores message service settings from NVM.



AT+CRES=?



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



3.4.9. AT+CMMS - More Message to Send

Set command controls the continuity of SMS relay protocol link. When feature is enabled (and supported by network) multiple messages can be sent much faster as link is kept open.



3GPP TS 27.005

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



AT+CMMS=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the relay protocol link continuity.

Values:

- 0 : disable
- 1 : keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 5 seconds, then the link is closed and the parameter <n> is automatically reset to 0
- 2 : enable (if the time between the response of the latest message send command and the next send command exceeds 5 seconds, the link is closed but the parameter <n> remains set to 2)

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

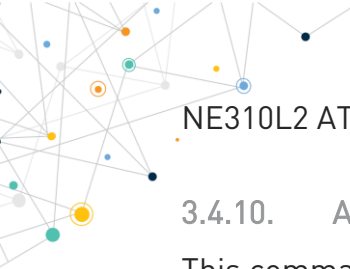
**AT+CMMS?**

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>**



3.4.10. AT+CNMI - New Message Indications to Terminal Equipment

This command sets the parameters for receiving SMS messages.



3GPP TS 27.005

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



AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Set command selects the behavior of the device on how the receiving of new messages from the network is indicated to the DTE.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	unsolicited result codes buffering option.

Values:

- 0 : Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
- 1 : Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved, otherwise forward them directly to the TE.
- 2 : Buffer unsolicited result codes in the TA in case the DTE is busy and flush them to the TE after reservation. Otherwise forward them directly to the TE.
- 3 : if <mt> is set to 1, it enables the hardware ring line for 1 sec.

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

Values:

- 0 : No SMS-DELIVER indications are routed to the TE and message is stored.
- 1 : If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using the URC described in Additional info section.
- 2 : SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group) are routed directly to the TE using the URC described in the Additional info section.
- 3 : Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.

<bm>	integer	0	broadcast reporting option
-------------------	---------	---	----------------------------

Values:

- 0 : Cell Broadcast Messages are not sent to the DTE
- 2 : New Cell Broadcast Messages are sent to the DTE with the URC described in Additional info section.

<ds>	integer	0	SMS-STATUS-REPORTs reporting option
-------------------	---------	---	-------------------------------------

Values:

- 0 : status report receiving is not reported to the DTE and is not stored
 - 1 : the status report is sent to the DTE with the URC described in the Additional info section.
-

2 : if a status report is stored, then the unsolicited result code, described in Additional info section, is sent.

<bfr>	integer	0	buffered result codes handling method
--------------------	---------	---	---------------------------------------

Values:

- 0 : TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>=1..3 is entered (OK response shall be given before flushing the codes)
 - 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>**[,**<toa>*,*<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>, <dcs>, <pag>, <pags><CR><LF><data>

▶▶ **<ds>=1:**

PDU mode

+CDS: <length><CR><LF><PDU>

TEXT mode

+CDS: <fo>, <mr>, <ra>, <tora>, <scts>, <dt>, <st>

Acknowledge for the received SMS-STATUS-REPORT SM is sent to network immediately when **+CSMS <service>** is set to '0' or when **+CSMS <service>** is set to '1', acknowledge is sent via **+CNMA** command during pre-defined timeout, an error is sent to network in case timeout expire, next **+CDS** response is depend on acknowledge of current received **+CDS** response in case **+CSMS <service>** parameter set to '1'.

▶▶ **<ds>=2:**

+CDSI: <mems>, <index>

Unsolicited fields:

Name	Type	Description
<mems>	string	memory storage where the new message is stored: "SM", "ME".
<index>	integer	location on the memory where SMS is stored.
<alpha>	string	alphanumeric representation of originator/destination number corresponding to the entry found in MT phonebook; used character set should be the one selected with command +CSCS .
<lenght>	integer	PDU length
<PDU>	string	PDU message
<oa>	string	originating address, string type converted in the currently selected character set (see +CSCS)
<alpha>	string	alphanumeric representation of <oa>; used character set should be the one selected with command +CSCS .
<scts>	string	arrival time of the message to the SC
<tooa>	integer	type of number <oa>: 129 - number in national format 145 - number in international format (contains the "+")
<fo>	string	first octet of message PDU, see 3GPP TS 03.40/23.040
<pid>	string	Protocol Identifier
<dcs>	string	Data Coding Scheme
<sca>	string	Service Centre address, string type, converted in the currently selected character set (see +CSCS)
<tosca>	integer	type of number <sca>: 129 - number in national format 145 - number in international format (contains the "+")
<length>	integer	text length

<data>	string	TP-User-Data If <dc> 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 <dc> 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
<pages>	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

- i** 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
```



3.4.11. AT+CNMA - New Message Acknowledgement

This command is used to confirm the correct reception of a new message.



3GPP TS 27.005

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



AT+CNMA

Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE.

Acknowledge with **+CNMA** is possible only if the **+CSMS** parameter is set to 1 (**+CSMS=1**) when a **+CMT** or **+CDS** indication is shown.

If no acknowledgement is given within the network timeout (17 seconds), an **RP-ERROR** is sent to the network, the **<mt>** and **<ds>** parameters of the **+CNMI** command are then reset to zero (do not show new message indication).

If command is executed, but no acknowledgement is expected, or some other ME related error occurs, result code **+CMS ERROR: <err>** is returned.

The AT command syntax and functionalities are different between SMS PDU Mode and SMS Text Mode, as explained in Additional info sections.

Additional info:

►► PDU Mode

AT+CNMA[=<n>[,<length>[<CR>PDU is given<ctrl-Z/ESC>]]]

Either positive (**RP-ACK**) or negative (**RP-ERROR**) acknowledgement to the network is possible. Parameter **<n>** defines which one will be sent. Optionally (when **<length>** is greater than zero) an acknowledgement TPDU (**SMS-DELIVER-REPORT** for **RP-ACK** or **RP-ERROR**) may be sent to the network. The entering of PDU is done similarly as specified in command

Send Message **+CMGS**, except that the SMSC address field is not present.

Name	Type	Default	Description
<n>	integer	N/A	type of acknowledgement in PDU mode
Values:			
0	:	send RP-ACK without PDU (same as TEXT mode)	
1	:	send RP-ACK with optional PDU message	
2	:	send RP-ERROR with optional PDU message	
<length>	integer	-	length of the PDU message

►► Text Mode

AT+CNMA

Only positive acknowledgement to network (**RP-ACK**) is possible.

? AT+CNMA=?

Test command returned information are different between SMS PDU Mode and SMS Text Mode, as explained below.

Additional info:

►► PDU Mode

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

►► Text Mode

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



- i 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.

- i 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



3.4.12. AT+CMGL - List Messages

This command is used to list the messages.



3GPP TS 27.005

3GPP TS 23.040

3GPP TS 23.038

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

**AT+CMGL[=<stat>]**

Execution command reports the list of all the messages with status value **<stat>** stored into **<memr>** message storage (**<memr>** is the message storage for read and delete SMs as last settings of command **+CPMS**).

Parameter:

Name	Type	Default	Description
<stat>	mixed	-	<stat> parameter type and the command output depend on the last settings of the +CMGF command (message format to be used). There are two modes: PDU mode Text mode See the following Additional info sections.

Additional info:

- ▶▶ When message format is PDU mode, the **<stat>** parameter is:

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

<stat>	integer	N/A	status value
---------------------	---------	-----	--------------

Values:

- 0 : new message
- 1 : read message
- 2 : stored message not sent yet
- 3 : stored message already sent
- 4 : all messages

► In case of PDU mode the representation format (see **+CMGF**) is:

+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[<CR><LF>
+CMGL: <index>,<stat>,<alpha>,<length><CR><LF><pdu>[...]]

Name	Type	Default	Description
<index>	integer	-	message position in the storage list.
<stat>	integer	-	message status. See the above <stat> parameter description.
<alpha>	string	-	String type alphanumeric representation of <da> or <oa> , corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS .
<length>	integer	-	PDU length in bytes
<pdu>	string	-	message in PDU format, according to 3GPP TS 23.040

► When message format is TEXT mode, the **<stat>** parameter is:

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

<stat>	string	N/A	status value
---------------------	--------	-----	--------------

Values:

"REC
UNREAD" : new message

"REC READ" : read message

"STO UNSENT" : stored message not sent yet

"STO SENT" : stored message already sent

"ALL" : all messages

- In case of TEXT mode, the representation format for stored messages (either sent or unsent) or received messages (either read or unread, not message delivery confirm) is:

+CMGL:

<index>, **<stat>**, **<oa/da>**, **<alpha>**, **<scts>** [*, <tooa/toda>*, *<length>*] **<CR>** **<LF>**
<data> [**<CR>** **<LF>**

+CMGL:

<index>, **<stat>**, **<oa/da>**, **<alpha>**, **<scts>** [*, <tooa/toda>*, *<length>*] **<CR>** **<LF>**
<data> [...]]

The information written in italics will be present depending on **+CSDH** last setting.

Name	Type	Default	Description
<index>	integer	-	message position in the storage list.
<stat>	string	-	message status. See the above <stat> parameter description.
<oa/da>	string	-	originator/destination address, represented in the currently selected character set (see +CSCS).
<alpha>	string	-	The alphanumeric representation of <da> or <oa> , corresponding to an

			entry found in the phonebook; used character set is the one selected with command +CSCS .
<scts>	string	-	TP-Service Centre Time Stamp in Time String Format.
<tooa/toda>	integer	N/A	type of number <oa/da>
	Values:		
	129	:	number in national format
	145	:	number in international format (contains the "+")
<length>	integer	-	text length
<data>	string	-	<p>TP-User-Data</p> <p>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)</p> <p>If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)</p> <p>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.</p>

- 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

- i** If parameter is omitted the command returns the list of SMS with "REC UNREAD" status.
- i** 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



3.4.13. AT+CMGR - Read Message

This command is used to read a message.



3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

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



AT+CMGR=<index>

Execution command reports the message with location value <index> from <memr> message storage (<memr> is the message storage for read and delete SMs as last settings of command +CPMS).

Parameter:

Name	Type	Default	Description
<index>	integer	-	message index. The command output depends on the last settings of command +CMGF (message format to be used). There are two modes: PDU mode Text mode

See the following Additional info sections.

Additional info:

- ▶ In case of PDU mode, if there is a message in location <index>, the output has the following format:

+CMGR: <stat>,<alpha>,<length><CR><LF><pdu>

Name	Type	Default	Description
<stat>	integer	N/A	status of the message
Values:			
	0	:	new message
	1	:	read message
	2	:	stored message not yet sent
	3	:	stored message already sent
<alpha>	string	-	string type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS
<length>	integer	-	PDU length in bytes
<pdu>	string	-	message in PDU format, according to 3GPP TS 23.040

- In case of Text mode, if there is a received message in location <index>, the output has the following format (the information written in italics will be present depending on **+CSDH** last setting):

```
+CMGR:<stat>,<oa>,<alpha>,<scts>
[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>
```

If there is either a sent or an unsent message in location <index> the output format is:

```
+CMGR:<stat>,<da>,<alpha>
[,<toda>,<fo>,<pid>,<dcs>,<vp>,<sca>,<tosca>,<length>]<CR><LF><data>
```

If there is a Message Delivery Confirm 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:		
	"REC UNREAD"	:	new received message
	"REC READ"	:	received message read
	"STO UNSENT"	:	message stored not yet sent
	"STO SENT"	:	message stored already sent
<fo>	integer	-	first octet of the message PDU
<mr>	integer	-	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<scts>	string	-	arrival time of the message to the SC
<dt>	string	-	sending time of the message
<st>	integer	-	message status as coded in the PDU
<pid>	integer	-	Protocol Identifier
<dcS>	integer	-	Data Coding Scheme
<vp>	mixed	-	Validity Period; its format depends on SMS-SUBMIT <fo> setting (see +CPMS): <ol style="list-style-type: none"> Not present: if <fo> tells that Validity Period Format is not present Integer: if <fo> tells that Validity Period Format is relative Quoted time-string type: if <fo> tells that Validity Period Format is absolute



			4.	Quoted hexadecimal representation of 7 octets: if <fo> tells that Validity Period Format is enhanced
<oa>	string	-		Originator address, represented in the currently selected character set (see +CSCS).
<da>	string	-		Destination address, represented in the currently selected character set (see +CSCS).
<alpha>	string	-		The alphanumeric representation of <da> or <oa> , corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS .
<sca>	string	-		Service Centre Address
<toa>	integer	N/A		type of number of <oa>
	Values:			
	129	:		number in national format
	145	:		number in international format (contains the "+")
<toda>	integer	N/A		type of number of <da>
	Values:			
	129	:		number in national format
	145	:		number in international format (contains the "+")
<tosca>	integer	N/A		type of number of <sca>
	Values:			
	129	:		number in national format
	145	:		number in international format (contains the "+")

<length>	integer	-	text length
<data>	string	-	TP-User-Data If <dcs> indicates that 3GPP TS 23.038 default alphabet is used, each character of GSM alphabet will be converted into current TE character set (see +CSCS) If <dcs> indicates that 8-bit 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)

- i** 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
```




3.4.14. AT+CMGS - Send Short Message

The command is related to sending short messages.



3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

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



AT+CMGS

Execution command sends a short message to the network. It can have two syntax formats according to the SMS format: PDU or Text mode (see **+CMGF** command). If short message is successfully sent to the network, the result is shown with the following URC:

+CMGS: <mr>[,<scts>]

Additional info:

- ▶ In PDU mode the **+CMGS** command has the following syntax:

AT+CMGS=<length>

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

and waits for the specified number of bytes. the PDU shall be hexadecimal format (each octet of the PDU is given as two IRA character long hexadecimal number) and given in one line.

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<length>	integer	N/A	length in bytes of the PDU to be sent (excluding the SMSC address octets)
Value:			
7÷164 : number of bytes			

- In Text mode the **+CMGS** command has the following syntax:

AT+CMGS=<da>[,<toda>]

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt, you can enter text that should be formatted as follows:

if current <dcs> (see **+CSMP**) indicates that GSM03.38 default alphabet is used and current <fo> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to 3GPP TS 27.005, Annex A; backspace can be used to delete last character and carriage returns can be used; after every <CR> entered by the user the sequence <CR><LF><greater_than><space> is sent to the TE.

if current <dcs> (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current <fo> (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the 'asterisk' will be entered as 2A (IRA50 and IRA65) and this will be converted to an octet with integer value 0x2A)

To send the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<da>	string	-	destination address, string type represented in the currently selected character set (see +CSCS).
<toda>	string	129	type of destination address

Values:




129 : number in national format

145 : number in international format (contains the "+")

Unsolicited fields:


Name	Type	Description
<mr>	integer	TP-Message-Reference number as per 3GPP TS 23.040
<scts>	string	TP-Service Centre Time Stamp in Time String Format. <scts> is returned when +CSMS <service> value is 1 and network supports.

- i** The DCD signal shall be in **ON** state while data is entered. The echoing of data is controlled by echo command **E**.
- i** 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
```

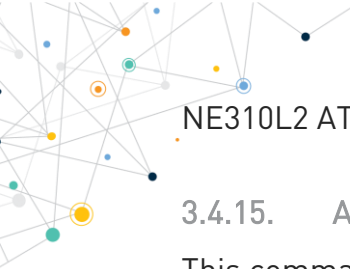
```
AT+CSMP=17,167,0,0
```

```
AT+CMGS="01090255219",129
```

```
>TEST MESSAGE
```

```
+CMGS:125
```

```
OK
```



3.4.15. AT+CMSS - Send Message from Storage

This command sends to the network a message which is already stored in the **<memw>** storage.



3GPP TS 27.005

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



AT+CMSS=<index>[,<da>[,<toda>]]

Execution command sends to the network a message which is already stored in the **<memw>** storage (see **+CPMS**) at the location **<index>**.

Parameters:

Name	Type	Default	Description
<index>	string	-	location value in the message storage <memw> of the message to send
<da>	string	-	destination address, string type represented in the currently selected character set (see +CSCS); if it is given it shall be used instead of the one stored with the message.
<toda>	integer	N/A	type of destination address

Values:

129 : number in national format

145 : number in international format (contains the "+")

Additional info:

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



+CMSS: <mr>


where:

<mr> - message reference number.

If message sending fails for some reason, an error code is reported:

+CMS ERROR:<err>

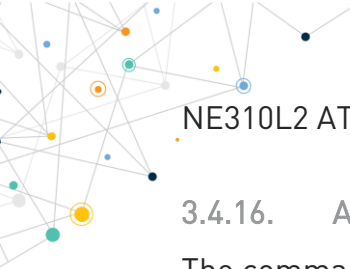
-  To store a message in the <memw> storage see command **+CMGW**.
-  Care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.

 **AT+CMSS=?**

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



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



3.4.16. AT+CMGW - Write Short Message to Memory

The command is related to writing short messages.



3GPP TS 27.005
3GPP TS 23.040
3GPP TS 23.038

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



AT+CMGW

Execution command writes a new short message in the **<memw>** memory storage (see **+CPMS**). It can have two syntax formats according to the SMS format: PDU or Text mode (see **+CMGF** command). If short message is successfully written the following URC is displayed:

+CMGW: <index>

Additional info:

- ▶ In PDU mode the **+CMGW** command has the following syntax:

AT+CMGW=<length>[,<stat>]

After command line is terminated with **<CR>**, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

and waits for the specified number of bytes.

To write the message issue Ctrl-Z char (0x1A hex). To exit without sending the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<length>	integer	N/A	length in bytes of the PDU to be written
Value:			
7÷164 : number of bytes			
<stat>	integer	N/A	message status
Values:			
0 : new message new message (received unread message; default for DELIVER messages (3GPP TS 23.040 SMS-DELIVER messages))			
1 : read message			
2 : stored message not sent yet (default for SUBMIT messages (3GPP TS 23.040 SMS-SUBMIT messages))			
3 : stored message already sent			
<data>	hex	-	PDU bytes, given in online mode

- In Text mode the **+CMGW** command has the following syntax:

AT+CMGW[=<da>[,<toda>[,<stat>]]]

After command line is terminated with <CR>, the module responds sending a four-character sequence prompt:

<CR><LF><greater_than><space> (IRA 13, 10, 62, 32)

After this prompt, you can enter text that should be formatted as follows:

if current <dcs> (see +CSMP) indicates that GSM03.38/23.038 default alphabet is used and current <fo> (see +CSMP) indicates

that 3GPP TS 03.40/23.040 TP-User-Data-Header-Indication is not set, then ME/TA converts the entered text into GSM alphabet, according to 3GPP TS 27.005, Annex A; backspace can be used to delete last character and carriage returns can be used..

if current **<dcs>** (see **+CSMP**) indicates that 8-bit or UCS2 data coding scheme is used or current **<fo>** (see **+CSMP**) indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set, the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. the 'asterisk' will be entered as 2A (IRA50 and IRA65) and this will be converted to an octet with integer value 0x2A)

The command waits for the specified number of bytes.

To write the message issue Ctrl-Z char (0x1A hex). To exit without writing the message issue ESC char (0x1B hex).

Name	Type	Default	Description
<da>	string	-	destination address, string type represented in the currently selected character set (see +CSCS).
<toda>	integer	N/A	type of destination address
	Values:		
	129	:	number in national format
	145	:	number in international format (contains the character "+")
<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.

- i** The DCD signal shall be in **ON** state while <data> is entered. The echoing of <data> is controlled by echo command **E**.
- i** 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.
- i** Care must be taken to ensure that during the command execution, which may take several seconds, no other SIM interacting commands are issued.
- i** 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

- i** 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
```





3.4.17. AT+CMGD - Delete Message

This command allows to delete from memory messages.



3GPP TS 27.005

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



AT+CMGD=<index>[,<delflag>]

Execution command deletes SMS message(s) from a selected memory storage. Storage is selected by command **+CPMS**.

Parameters:

Name	Type	Default	Description
<index>	integer	-	Message index in the selected storage; it can have values 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

Values:


- 0 : delete message specified in <index>
- 1 : delete all read messages from selected storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
- 2 : delete all read messages from selected storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched



3 : delete all read messages from selected storage, sent and unsend mobile originated messages, leaving unread messages untouched

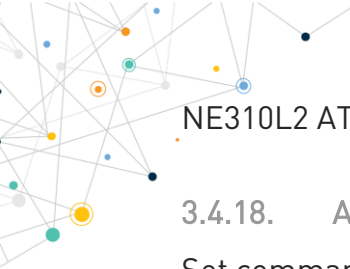
4 : delete all messages from selected storage.

i 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



3.4.18. AT+CGSMS - Select Service for MO SMS Messages

Set command is used to specify the service or service preference that the MT will use to send MO SMS messages.



3GPP TS 27.005

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



AT+CGSMS=[<service>]

Parameter:

Name	Type	Default	Description
<service>	integer	1	indicates the service or service preference to be used

Values:

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

i 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>

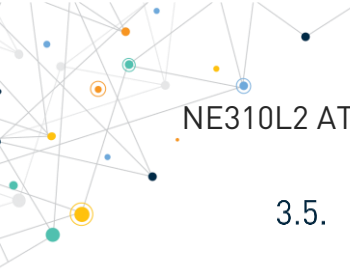


AT+CGSMS=?

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



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



3.5. Phonebook

3.5.1. 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	MAX timeout	SELINT
Required	Specific profile	No	-	2



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 2/2+ SIM)
- "LD" : SIM last-dialing-phonebook (+CPBF is not applicable for this storage)
- "MC" : device missed (unanswered received) calls list (+CPBF is not applicable for this storage)
- "RC" : ME received calls list (+CPBF is not applicable for this storage)

- "MB" : mailbox numbers stored on SIM; it is possible to select this storage only if the mailbox service is provided by the SIM (see #MBN)
- "DC" : ME last-dialing-phonebook (+CPBF is not applicable for this storage)
- "ME" : ME phonebook
- "EN" : SIM emergency numbers phonebook (+CPBW and +CPBF not applicable for this storage)
- "ON" : SIM own numbers (MSISDNs) phonebook (+CPBF is not applicable for this storage)
- "SD" : SIM Service Dialing Numbers (SDN) phonebook (+CPBW is not applicable for this storage)

<password> string - string type value representing the PIN2-code required when selecting PIN2-code locked **<storage>** above "FD".
if **<password>** parameter is given, PIN2 will be verified, even if it is not required, i.e. PIN2 is verified even if it has already been inserted and verified during current session.

- i** If "SM" is the currently selected phonebook, selecting "FD" phonebook with **AT+CPBS="FD"** command simply selects the FDN as the phonebook upon which all subsequent **+CPBW**, **+CPBF** and **+CPBR** commands act.

The command does not deactivate "SM" phonebook, and does not activate FDN.



AT+CPBS?

Read command returns the actual values of the parameter **<storage>**, the number of occupied records **<used>** and the maximum index number **<total>**, in the format:

+CPBS: <storage>,<used>,<total>

- i** For **<storage>="MC"**: if there are more than one missed calls from the same number the read command will return only the last call.

?  AT+CPBS=?

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



3.5.2. AT+CPBR - Read Phonebook Entries

The command reads phonebook entries.



3GPP TS 27.007

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



AT+CPBR=<index1>[,<index2>]

Execution command returns phonebook entries in location number range <index1>..<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is 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: 129 : national numbering scheme 145 : international numbering scheme (contains the character "+")
<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: 0 : phonebook entry not hidden 1 : phonebook entry hidden
<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

- i** 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.
- i** 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

- i** 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.

3.5.3. AT+CPBF - Find Phonebook Entries

This command returns phonebook entries.



3GPP TS 27.007

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



AT+CPBF=<findtext>

Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field start with string <findtext>.

Parameter:

Name	Type	Default	Description
<findtext>	string	-	string to be searched among the phonebook entries; 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

- i** +CPBF is not applicable if the current selected storage (see +CPBS) is either "MC", "RC" or "LD".
- i** If <findtext>="" the command returns all the phonebook records.
- i** 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>

- i** 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.

3.5.4. AT+CPBW - Write Phonebook Entry

This command writes phonebook entry in the current phonebook memory.



3GPP TS 27.007

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


AT+CPBW=[<index>],[<number>,[<type>],[<text>],[<group>],[<adnumber>],[<adtype>],[<secondtext>],[<email>],[<hidden>]]]]]]]]]]

Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

Parameters:

Name	Type	Default	Description
<index>	integer	-	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
Values:			
	129	:	national numbering scheme
	145	:	international numbering scheme (contains the character "+")
<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
Values:			
0 : phonebook entry not hidden			
1 : phonebook entry hidden			

- i** If record number **<index>** already exists, it will be overwritten.
- i** If either **<number>**, **<type>** and **<text>** are omitted, the phonebook entry in location **<index>** is deleted.
- i** 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.

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>

- i** 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"
```

3.6. Time & Alarm

3.6.1. AT+CCLK - Clock Management

The command is related to real time clock management.



3GPP TS 27.007

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



AT+CCLK=<time>

Set command sets the real-time clock of the module.


Parameter:

Name	Type	Default	Description
<time>	string	N/A	Current time as quoted string in the format: "yy/MM/dd, hh:mm:ss±zz"

Values:

- yy : year (two last digits are mandatory), range is 00..99
- MM : month (two digits are mandatory), range is 01..12
- dd : day (two digits are mandatory) The range for dd(day) depends either on the month and on the year it refers to. Available ranges are: (01..28) (01..29) (01..30) (01..31). Trying to enter an out of range value will raise an ERROR message.
- hh : hour (two digits are mandatory), range is 00..23
- mm : minute (two digits are mandatory), range is 00..59
- ss : seconds (two digits are mandatory), range is 00..59

$\pm zz$: 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 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>



AT+CCLK=?

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



Set date and time:

```
AT+CCLK="02/09/07,22:30:00+00"
```

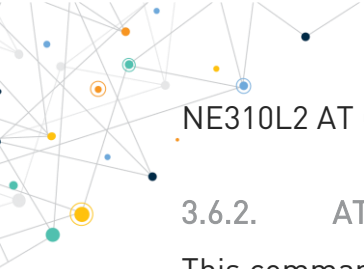
```
OK
```

Read date and time:

```
AT+CCLK?
```

```
+CCLK: "02/09/07,22:30:25"
```

```
OK
```



3.6.2. AT+CTZR - Time Zone Reporting

This command enables and disables the time zone change event reporting.

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

AT+CTZR=<onoff>

Set command permits to enable/disable the time zone change event reporting.

If the reporting is enabled and whenever the time zone is changed, the MT returns the unsolicited result code:

+CTZV: <tz>

Parameter:

Name	Type	Default	Description
<onoff>	string	0	enable/disable the time zone change event reporting.

Values:

0 : Disable time zone change event reporting

1 : Enable time zone change event reporting

Unsolicited field:

Name	Type	Description
<tz>	string	New time zone.

AT+CTZR?

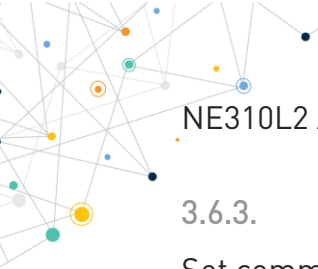
Read command reports the currently selected <onoff> in the format:



+CTZR: <onoff>

?  AT+CTZR=?

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



3.6.3. AT+CTZU - Automatic Time Zone Update

Set command enables/disables the automatic time zone update.



3GPP TS 27.007

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



AT+CTZU=<onoff>

Parameter:

Name	Type	Default	Description
<onoff>	integer	0	enables/disables the automatic time zone update

Values:

0 : disable

1 : enable



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>.

3.7. HW and Radio Control

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

Configure the general-purpose input/output GPIO pins.

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

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	-	<p>the parameter can be:</p> <p>logic value read from pin GPIO<pin> in the case the pin <dir> is set to input.</p> <p>logic value present in output of the pin GPIO<pin> in the case the pin <dir> is currently set to output.</p> <p>no meaning value for the pin GPIO<pin> in the case the pin <dir> is set to alternate function or tristate pull down.</p>

- ▶▶ **<dir>** values from 9 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 ALT_x, **<dir>** and the name of the associated function.

AT#GPIO=<pin>,0,<dir>

ALT _x	Functions names (between quotes) associated to ALT _x
ALT8 (<dir> =9)	#GPIO maps "DTR" on GPIO_01 or GPIO_05
ALT9 (<dir> =10)	#GPIO maps "RING" on GPIO_02 or GPIO_06
ALT15 (<dir> =16)	#GPIO maps "DCD" on one of the available GPIOs

-  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



3.8. Easy Scan

3.8.1. AT#CSURV - Network Survey

The command performs a survey on the selected band channels.

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



AT#CSURV[=[<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>.

Network registration is required.

Issuing AT#CSURV<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, one for each received carrier, is reported.

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	-	starting channel, see note section.
<e>	integer	-	ending channel, see note section.

Additional info:

►► 4G Networks

Network survey information text lines for NBloT:

earfcn: <earfcn> rxLev: <rxLev> mcc: <mcc> mnc: <mnc> cellid:
<cellid> tac: <tac> cellIdentity: <cellIdentity>

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

►► **#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



4G Network

<s> and <e> parameters can assume the values shown in the Channels Ranges column, according to the module in use.

Channels Ranges	LTE Bands
0,599	1
600,1199	2
1200,1949	3
1950,2399	4
2400,2649	5
3450,3799	8
5010,5179	12
5180,5279	13
5850,5999	18
6000,6149	19
6150,6449	20
8690,9039	26
9210,9659	28



- 4G Network

AT#CSURV

Network survey started ...

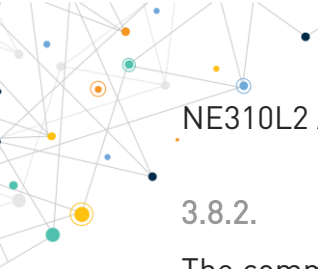
earfcn: 5110 rxLev: -73 mcc: 136 mnc: 19A cellld: 10D tac: 2700
cellldentity: BBA7211

earfcn: 5110 rxLev: -73 mcc: 139 mnc: 064 cellld: 10D tac: 2700
cellldentity: BBA7211

earfcn: 5110 rxLev: -70 cellld: 009B

Network survey ended (Carrier: 2 BCCh: 2)

OK



3.8.2. AT#CSURVF - Network Survey Format

The command configures the numbers format used in the messages related to the surveying of the network bands channels.

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

AT#CSURVF=[<format>]

Set command configures the numbers format in each information text line of the network survey message (Easy Scan (R)).

Parameter:

Name	Type	Default	Description
<format>	integer	0	format of some numbers (see #CSURV and #CSURVC) in each network survey information text line

Values:

- 0 : Decimal
- 1 : Hexadecimal
- 2 : Hexadecimal and extended network survey end message format

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>.





3.9. Packet Domain

3.9.1. AT+CGDCONT - Define PDP Context

Define PDP Context.



3GPP TS 27.007

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

➡ **AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<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:

"IP" : Internet Protocol

"IPV6" : Internet Protocol version 6



"IPV4V6" : Virtual introduced to handle dual IP stack UE capability.

Non-IP : Transfer of Non-IP data to external packet data network

<APN>	string	-	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is empty ("") or omitted, then the subscription value will be requested.
<PDP_addr>	string	-	A string parameter that identifies the terminal in the address space applicable to the PDP. The allocated address may be read using the +CGPADDR command.
<d_comp>	integer	0	Numeric parameter that controls PDP data compression.

Values:

0 : PDP data compression off (default if value is omitted)

1 : PDP data compression on

2 : V.42bis (applicable only for products supporting GSM)

<h_comp>	integer	0	Numeric parameter that controls PDP header compression.
----------	---------	---	---

Values:

0 : PDP header compression off (default if value is omitted)



- 1 : PDP header compression on
- 2 : RFC1144 (applicable only for products supporting GSM; applicable for SNDCP only)
- 3 : RFC2507 (applicable only for products supporting GSM)
- 4 : RFC3095 (applicable only for products supporting GSM; applicable for PDCP only)

<IPv4AddrAlloc>	integer	0	a numeric parameter that controls how the MT/TA requests to get the IPv4 address information.
------------------------------	---------	---	---

Value:

- 0 : IPv4 Address Allocation through NAS Signaling (default)

<emergencyIndication>	integer	0	a numeric parameter used to indicate whether the PDP context is for emergency bearer services or not.
------------------------------------	---------	---	---

Value:

- 0 : PDP context is not for emergency bearer services (default)
-

i To erase all params for a <cid> give as follows:
AT+CGDCONT=<cid>,<pdp_type>,""

AT+CGDCONT?

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



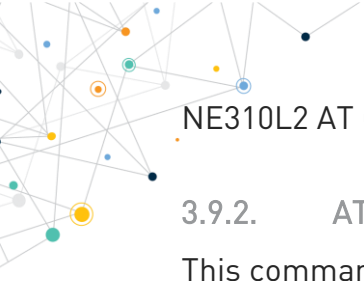
+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,0,0<CR><LF>

+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
```



3.9.2. AT+CGPADDR - Show PDP Address

This command returns a list of PDP addresses for the specified context identifiers.



3GPP TS 27.007

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

**AT+CGPADDR=[<cid>[,...]]**

Execution command returns a list of PDP addresses for the specified context identifiers.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a PDP context definition, see +CGDCONT command. If no <cid> specified, the addresses for all defined contexts are returned.

Additional info:

- ▶▶ The command returns a row of information for every <cid> whose context has been defined. No row is returned for a <cid> whose context has not been defined. Here is the response format:

```
+CGPADDR: <cid>,<PDP_addr><CR><LF>
```

```
+CGPADDR: <cid>,<PDP_addr><CR><LF>
```

```
...
```

Name	Type	Default	Description
<PDP_addr>	string	-	identifies the terminal in an address space applicable to the



PDP. The address may be static or dynamic:

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>**.



Only PDP contexts 1 and 2 can be defined



AT+CGPADDR=?

+CGPADDR: (1)

OK



3.9.3. 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	MAX timeout	SELINT
Not required	Auto	No	-	2



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:			
0 : no authentication			
1 : PAP authentication			
2 : CHAP authentication			
<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:<cid_max>,<auth_type_max>,<username_max><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>**.



3.9.4. AT+CGCONTRDP - PDP Context Read Dynamic Parameters

The execution command returns the relevant information for a PDP Context established by the network.



3GPP TS 27.007

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



AT+CGCONTRDP[=<cid>]

The execution command returns the relevant information on a PDP Context established by the network with the context identifier <cid>. If the parameter <cid> is omitted, the information for all established PDP contexts is returned. The response message has the following format:

```
+CGCONTRDP:<cid>,<bearerId>,<apn>[,<ip&subnet>[,<gw_addr>[,<DNS_prim>
[,<DNS_sec>[, <P_CSCF_prim>[,<P_CSCF_sec>]]]]]]][<CR><LF>
+CGCONTRDP:<cid>,<bearerId>,<apn>[,
<ip&subnet_mask>[,<gw_addr>[,<DNS_prim>
[,<DNS_sec>[, <P_CSCF_prim>[,<P_CSCF_sec>]]]]]] [...]]
```

If the context cannot be found an **ERROR** response is returned. The response message parameters are described in the Additional info section.

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**.

- i** 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.
- i** 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.



3.9.5. AT+CGPIAF - Printing IP Address Format

This command selects the printout format of the IPv6 address.



3GPP TS 27.007

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



AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros> [,<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:

- 0 : use IPv4-like dot-notation. IP addresses, and subnetwork mask if applicable, are dot-separated.
- 1 : use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.

<IPv6_SubnetNotation>	integer	0	selects the subnet-notation for remote address and subnet mask. Setting does not apply if IPv6 address format <IPv6_AddressFormat>=0.
-----------------------	---------	---	---

Values:



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

1 : the printout format is applying /(forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation.

<IPv6_LeadingZeros>	integer	0	selects whether leading zeros are omitted or not. Setting does not apply if IPv6 address format <IPv6_AddressFormat>=0 .
----------------------------------	---------	---	---

Values:

0 : leading zeros are omitted.

1 : leading zeros are included.

<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:

0 : no zero compression.

1 : use zero compression.

AT+CGPIAF?

Read command returns the current parameter setting.

AT+CGPIAF=?

Test command returns values supported as compound values.

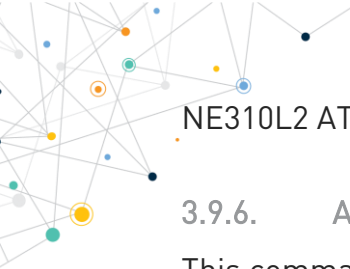


```
AT+CGPIAF=0,0,0,0  
OK
```

```
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:EF:0:0:0:0:1  
OK
```



3.9.6. AT+CGEREP - Packet Domain Event Reporting

This command enables or disables the presentation of unsolicited result codes.



3GPP TS 27.007

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



AT+CGEREP=[<mode>[,<bfr>]]

Set command enables/disables sending of unsolicited result codes in case of certain events occurring in the module or in the network. The URC formats and related events are shown in the Additional info sections.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	controls the processing of URCs specified with this command.

Values:

- 0 : buffer unsolicited result codes in the TA. If TA result code buffer is full, the oldest one can be discarded. No codes are forwarded to the TE.
- 1 : discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.
- 2 : buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when TA-TE link becomes available; otherwise forward them directly to the TE.

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

Values:

- 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
<code><PDP_type></code>	string	Packet Data Protocol type, which specifies the type of packet data protocol
<code><PDP_addr></code>	string	identifies the terminal in the address space applicable to the PDP
<code><cid></code>	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.

3.9.7. AT+CGREG - GPRS Network Registration Status

Set command controls the presentation of the **+CGREG**: unsolicited result code



3GPP TS 27.007

3GPP TS 24.008

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



AT+CGREG=[<mode>]

Set command enables/disables the **+CGREG**: unsolicited result code, and selects one of the available formats:

short format:

+CGREG:<stat>

long format:

+CGREG:<stat>[,<lac>,<ci>[,<AcT>,<rac>]]

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: URC short format is displayed every time there is a change in the network registration status</p>



URC long or extra long format is displayed, according to **<mode>** value, every time there is a change of the network cell.


Values:


- 0 : disable the network registration unsolicited result code
- 1 : enable the network registration unsolicited result code, and selects the short format
- 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"> 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 : out of coverage 5 : registered, roaming
<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: 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?**

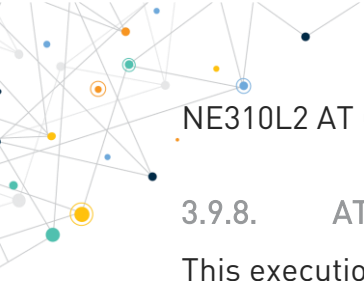
Read command returns the current value of **<mode>**, the registration status **<stat>**, and the network information (**<lac>**, **<ci>**, **<AcT>**, and **<rac>**) according to the used **<mode>** parameter value.

+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>**.



3.9.8. AT+CGATT - PS Attach or Detach

This execution command is used to register (attach) the terminal to or deregister (detach) the terminal from the Packet Domain service.



3GPP TS 27.007

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



AT+CGATT=<state>

Parameter:

Name	Type	Default	Description
<state>	integer	N/A	state of PS attachment

Values:

0 : detached

1 : attached



AT+CGATT?

Read command returns the current PS state in the format:

+CGATT: <state>



AT+CGATT=?

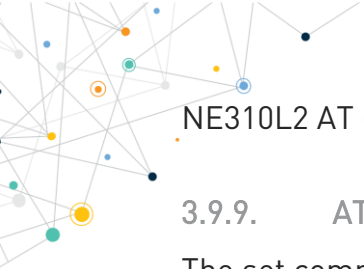
Test command returns the values range of the <state> parameter.



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

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

```
AT+CGATT=1  
OK
```



3.9.9. 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	MAX timeout	SELINT
Required	No	No	-	2

 **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 +CGDCONT command)
<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:

- 0 : no information available
- 1 : the MT expects that exchange of data will be completed with the transmission of the ESM DATA TRANSPORT message
- 2 : the MT expects that exchange of data will be completed with the receipt of an ESM DATA TRANSPORT Message

<typeOfUserData>	integer	0	indicates whether the user data that is transmitted is regular or exceptional
-------------------------------	---------	---	---

Values:

- 0 : regular data
 - 1 : exception data
-

AT+CSODCP=?

Test command reports the supported range of values for parameters: **<cid>**, **<cpdataLength>**, **<RAI>** and **<typeOfUserData>**.

3.9.10. 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	MAX timeout	SELINT
Required	No	No	-	2

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 +CGDCONT command)
<cpdataLength>	integer	indicates the number of octets of the <cpdata> information element
<cpdata>	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 **<cpdata>** are implementation specific



AT+CRTDCP?

Read command returns the current parameter setting for **+CRTDCP** command in the format:

+CRTDCP: <reporting>



AT+CRTDCP=?

Test command reports the supported range of values for parameter **<reporting>**, and range of supported **<cid>** and **<cpdataLength>**.



3.10. IPEasy

3.10.1. AT#SGACT - Context Activation

This command enables/disables the PDP context activation.

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

AT#SGACT=<cid>,<stat>[,<userId>[,<pwd>]]

Execution command is used to activate the specified PDP context, followed by binding data application to the PS network. Also, it is used to deactivate the PDP context and unbind data application from PS network.

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)

- i** Context activation/deactivation returns **ERROR** if there is not any socket associated to it, see **#SCFG**.
- i** 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.
- i** 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.
- i** **#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: <cid₁₁><CR><LF>

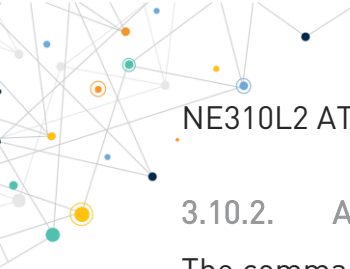
...

#SGACT: <cid_n>,<stat_n>

-  Each row in the read command's answer is optional.

 AT#SGACT=?

Test command reports the range for the parameters <cid> and <stat>.



3.10.2. AT#SCFG - Socket Configuration

The command sets the configuration for the socket.

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

 **AT#SCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>**

Set command sets the socket configuration parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
Value:			
1÷6	:	Socket connection identifier value	
<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:			
0	:	select automatically default value	
1÷1500	:	packet size in bytes	
<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 six sockets, in the format:

```
#SCFG:
<connld1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF>
#SCFG:
<connld2>,<cid2>,<pktsz2>,<maxTo2>,<connTo2>,<txTo2><CR><LF>
...
#SCFG: <connld6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>
```



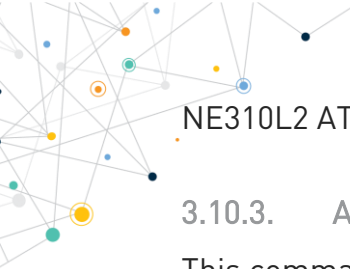
AT#SCFG=?

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



Example of test 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



3.10.3. AT#SCFGEXT - Socket Configuration Extended

This command sets the socket configuration extended parameters.

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

 **AT#SCFGEXT=<connId>,<srMode>,<recvDataMode>,<keepalive>[,<ListenAutoResp> [,<sendDataMode>]]**

Set command sets the socket configuration extended parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier
Value:			
1÷conMax : socket connection identifier. conMax value is returned by test command			
<srMode>	integer	0	SRING unsolicited mode, see Additional info section.
Values:			
0 : Normal			
1 : Data amount			
2 : Data view			
3 : Data view with UDP datagram information			
<recvDataMode>	integer	0	Data view mode for received data in command mode (#SRECV or <srMode> = 2)
Values:			
0 : Text mode			

1 : Hexadecimal mode

<keepalive>	integer	0	Set the TCP Keepalive value in minutes
--------------------------	---------	---	--

Values:

0 : deactivated

1÷240 : keepalive time in minutes

<ListenAutoRsp>	integer	0	set the listen auto-response mode, that affects the commands #SL and #SLUDP
------------------------------	---------	---	---

Values:

0 : deactivated

1 : activated

<sendDataMode>	integer	0	Data mode for sending data in command mode (#SEND)
-----------------------------	---------	---	---

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>
```

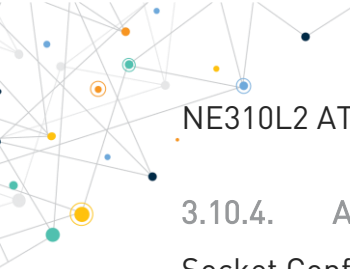
 **AT#SCFGEXT=?**

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
```



3.10.4. AT#SCFGEXT2 - Socket Configuration Extended 2

Socket Configuration Extended.

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

 **AT#SCFGEXT2=<connId>,<bufferStart>[,<abortConnAttempt>[,<unused_B>[,<unused_C> [,<noCarrierMode>]]]]**

Set command sets the socket configuration extended parameters for features not included in **#SCFGEXT** command.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
	1÷max	:	socket connection identifier value (max value is returned by the Test command)
<bufferStart>	integer	0	select one of the two data sending timeout methods, the first one defined "old" the second one "new". The "old" data sending timeout method is set - by default - by #SCFG command, which sets also the <txTo> data sending timeout value. With #SCFGETXT2 command, you can set either the "old" or the "new" data sending timeout method. If the "new" method is selected, the "old" one is automatically disabled. The checking if new data have been received from serial port



is done with a granularity that is directly related to **#SCFG** **<txTo>** setting with a maximum period of 1 sec.

Values:

- 0 : select "old" method: start transmission timer only first time if new data are received from the serial port
- 1 : select "new" method: restart transmission timer when new data is received from serial port

<abortConnAttempt>	integer	0	enable the abort of an ongoing connection attempt started by #SD command and before the reception of the CONNECT message (in online mode) or OK message (in command mode). Values automatically saved in NVM.
---------------------------------	---------	---	---

Values:

- 0 : not possible to interrupt connection attempt
- 1 : it is possible to interrupt the connection attempt (**<connTo>** set by **#SCFG** or DNS resolution running if required) and give back control to AT interface by reception of a character. As soon as the control given to the AT interface, the **ERROR** message will be received on the interface itself.

<unused_B>	integer	-	reserved for future use
<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.

- i** 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.
- i** 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.
- i** Like **#SLASTCLOSURE**, in case of subsequent consecutive closure causes received, the original disconnection cause indicated.
- i** 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>,0,0,<noCarrierMode1>  
><CR><LF>
```

...

```
#SCFGEXT2:<connId6>,<bufferStart6>,<abortConnAttempt6>,0,0,<noCarrierMode6>  
<CR><LF>
```

 **AT#SCFGEXT2=?**

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



- Set the new transmission timer behavior for `<connId>=1` and `<connId>=2` sockets.

```
AT#SCFGEXT2=1,1  
OK
```

```
AT#SCFGEXT2=2,1  
OK
```

Check the current extended configuration of the six sockets

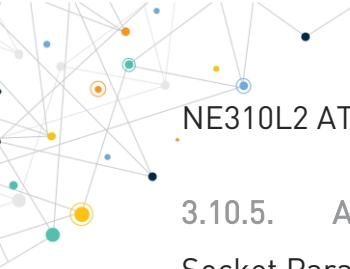
```
AT#SCFGEXT2?  
#SCFGEXT2: 1,1,0,0,0,0  
#SCFGEXT2: 2,1,0,0,0,0  
#SCFGEXT2: 3,0,0,0,0,0  
#SCFGEXT2: 4,0,0,0,0,0  
#SCFGEXT2: 5,0,0,0,0,0  
#SCFGEXT2: 6,0,0,0,0,0  
OK
```

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
```



3.10.5. AT#SKTRST - Socket Parameters Reset

Socket Parameters Reset

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



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=?

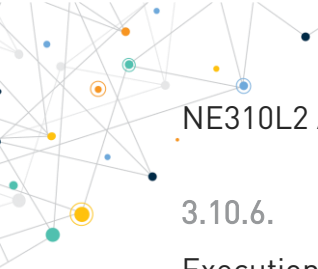
Test command returns the **OK** result code.



Reset of the socket parameters

```
AT#SKTRST
```


```
OK
```



3.10.6. AT#SD - Socket Dial

Execution command opens a remote connection via socket.

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

 **AT#SD=<connId>,<txProt>,<rPort>,<IPAddr>[,<closureType>[,<lPort>[,<connMode>[,<txTime>[,<userIpType>]]]]]**

Execution command opens a remote connection via socket.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
	Value:		
	1÷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:		
	1÷65535	:	remote host port number
<IPAddr>	string	-	IP address of the remote host:
			- any valid IP address in the format: "xxx.xxx.xxx.xxx"
			- any host name to be solved with a DNS query
			- any valid IPv6 address in the format:



			XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX:XXXX or xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx. xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx
--	--	--	--

<closureType>	integer	0	Socket closure behavior only for TCP when remote host has closed. The parameter has no effects for UDP connections.
----------------------------	---------	---	---

Values:

- 0 : local host closes immediately when remote host has closed
- 255 : local host closes after an escape sequence (+++)

<lPort>	integer	N/A	UDP connections local port <u>only for UDP</u> connections. The parameter has no effects for TCP connections.
----------------------	---------	-----	---

Value:

- 1÷65535 : UDP local port number

<connMode>	integer	0	Connection mode.
-------------------------	---------	---	------------------

Values:

- 0 : online mode connection
- 1 : command mode connection

<txTime>	integer	0	adjusting a time interval for series of UDP data packets will be uploaded.
-----------------------	---------	---	--

Values:

- 0 : Time interval is not requested
- 1÷1000 : Time interval in milliseconds

<userIpType>	integer	0	ip type for socket to open
---------------------------	---------	---	----------------------------

Values:

- 0 : no ip type chosen

1 : ipv4

2 : ipv6

- i** **<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.
- i** **<closureType>** parameter is valid for TCP connections only and has no effect (if used) for UDP connections.
- i** **<lPort>** parameter is valid for UDP connections only and has no effect (if used) for TCP connections
- i** 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>**.
- i** 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**.
- i** 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**.
- i** **<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`

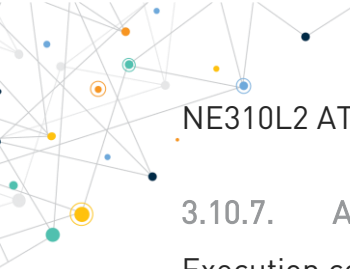
...

...

Open socket 1 in command mode

`AT#SD=1,0,80,"www.google.com",0,0,1`

`OK`



3.10.7. AT#SO - Socket Restore

Execution command resumes the direct interface to a socket connection which has been suspended by the escape sequence.

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



AT#SO=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

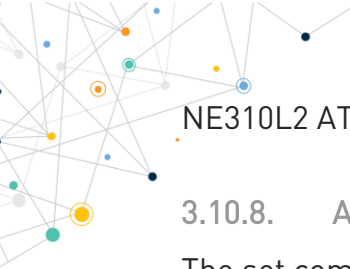
Value:

1÷conMax : socket connection identifier. conMax value is returned by test command



AT#SO=?

Test command reports the range of values for <connId> parameter



3.10.8. AT#SH - Socket Shutdown

The set command closes a socket.

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

AT#SH=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier to be closed

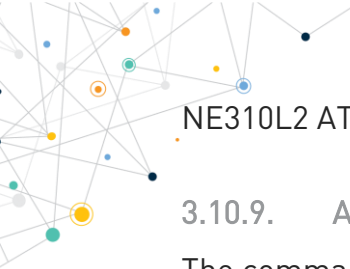
Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

Socket cannot be closed in states "resolving DNS" and "connecting", see #SS command.

AT#SH=?

Test command reports the range for parameter <connId>



3.10.9. AT#SL - Socket Listen

The command opens/closes socket listening.

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


AT#SL=<connId>,<listenState>,<listenPort>[,<lingerT>]

Set command opens/closes a socket listening for an incoming TCP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
1÷6 : socket connection identifier			
<listenState>	integer	N/A	listening action
Values:			
0 : close socket listening			
1 : start socket listening			
<listenPort>	integer	N/A	local listening port
Value:			
1÷65535 : local listening port value			
<lingerT>	integer	N/A	linger time
Values:			
0 : immediate closure after remote closure			

255 : local host closes only after an escape sequence (+++)

-  If successful, command returns a final result code **OK**. If the ListenAutoRsp flag has not been set through the command **#SCFGEXT** (for the specific <connId>), then, when a TCP connection request comes on the input port, if the sender is not filtered by internal firewall, an URC is received:

+SRING : <connId>

Afterwards we can use **#SA** to accept the connection or **#SH** to refuse it.

If the ListenAutoRsp flag has been set, then, when a TCP connection request comes on the input port, if the sender is not filtered by the internal firewall, the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into **online data mode**.

If the socket is closed by the network the following URC is received:

#SKTL: ABORTED



AT#SL?

Read command returns all the actual listening TCP sockets.



AT#SL=?

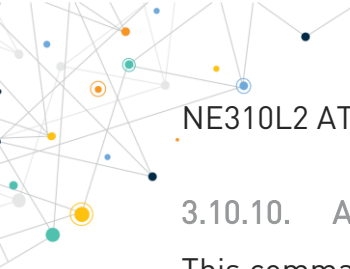
Test command returns the range of supported values of the parameters.



Open a socket listening for TCP on port 3500.

```
AT#SL=1,1,3500
```

```
OK
```



3.10.10. AT#SLUDP - Socket Listen UDP

This command opens/closes a socket listening for an incoming UDP connection on a specified port.

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



AT#SLUDP=<connId>,<listenState>,<listenPort>

Execution command opens/closes a socket listening for an incoming UDP connection on a specified port.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
1÷conMax : socket connection identifier. conMax value is returned by test command			
<listenState>	integer	0	indicates the action that will be performed
Values:			
0 : closes socket listening			
1 : starts socket listening			
<listenPort>	integer	1	local listening port
Value:			
1÷65535 : available port numbers			

- i** If the ListenAutoRsp flag has not been set through the command **#SCFGEXT** (for the specific conId), then, when an UDP connection request comes on the input port, if the sender is not filtered by internal firewall, an URC is received:

+SRING : <conId>

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, 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

- i** when closing the listening socket **<listenPort>** is a don't care parameter



AT#SLUDP?

Read command returns all the actual listening UDP sockets.



AT#SLUDP=?

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



Next command opens a socket listening for UDP on port 3500.

```
AT#SLUDP=1,1,3500
OK
```





3.10.11. AT#SA - Socket Accept

Execution command accepts an incoming socket connection.

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

AT#SA=<connId>[,<connMode>]

Execution command accepts an incoming socket connection after an URC

SRING: <connId>

Parameters:

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

<connId>	integer	N/A	Socket connection identifier.
----------	---------	-----	-------------------------------

Value:

1÷max : Socket connection identifier value (max is returned by the Test command)

<connMode>	integer	0	Connection mode, as for command #SD.
------------	---------	---	--------------------------------------

Values:

0 : online mode connection

1 : command mode connection

- The **SRING** URC has to be a consequence of a **#SL** issue.
- Setting the command before to having received a **SRING** will result in an **ERROR** indication, giving the information that a connection request has not yet been received.



 **AT#SA=?**

Test command reports the range of values for all the parameters.



3.10.12. AT#SSEND - Send Data in Command Mode

This command is used to send data through a connected socket.

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

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 **#SEND** 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#SEND=?

Test command returns the range of supported values for parameter **<connId>** and **<Rai>**.

 Send data through socket number 2
AT#SEND=2
>Test<CTRL-Z>
OK



3.10.13. AT#SENDEXT - Send Data in Command Mode extended

This command allows to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

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



AT#SENDEXT=<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#SENDEXT=...** 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:		
	1÷10	:	socket connection identifier
<bytesToSend>	integer	N/A	number of bytes to be sent
	Value:		






1÷maxBytes : maxBytes is the maximum number of bytes that can be sent and it is reported by the test command

<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"

-  It's possible to use **#SENDEXT** 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#SENDEXT=?

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.



3.10.14. AT#SRECV - Socket Receive Data in Command Mode

The command permits the user to read data arrived through a connected socket when the module is in command mode.

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



AT#SRECV=<connId>,<maxByte>[,<UDPInfo>]

Execution command permits the user to read data arrived through a connected socket but buffered and not yet read because the module entered command mode before reading them; the module is notified of these data by a **SRING:** URC, whose presentation format depends on the last **#SCFGEXT** setting.

Parameters:

Name	Type	Default	Description
<connId>	integer	NA	socket connection identifier
Value:			
1÷conMax	:	socket connection identifier. conMax value is returned by test command	
<maxByte>	integer	NA	max number of bytes to read
Value:			
1÷1500	:	max number of bytes to read	
<UDPInfo>	integer	0	enables/disables the visualization of UDP datagram information.
Values:			
0	:	UDP information disabled	
1	:	UDP information enabled, see Additional info section.	



Additional info:

- ▶▶ If `<UDPInfo>` is set to 1 (`AT#SRECV=<connId>,<maxBytes>,1`), the command returns a message having the following format:

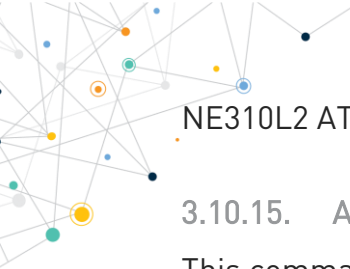
#SRECV: `<remoteIP>,<remotePort><connId>,<recData>,<dataLeft>`

Name	Type	Default	Description
<code><remoteIP></code>	string	-	remote ip address
<code><remotePort></code>	string	-	remote port address
<code><recData></code>	integer	-	received data
<code><dataLeft></code>	integer	-	remaining bytes in the datagram.

- ❗ Issuing `#SRECV` when there is no buffered data raises an error.

AT#SRECV=?

Test command returns the range of supported values for parameters `<connId>` `<maxByte>` and `<UDPInfo>`.



3.10.15. AT#SSENDUDP - Send UDP Data to a Specific Remote Host

This command allows to send data over UDP to a specific remote host.

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




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 #SEND, 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#SSENDUDP=?

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#SSENDUDP=1,<RemIP2>,<RemPort2>

>response to second host

OK



3.10.16. AT#SENDUDPEXT - Send UDP Data to a Specific Remote Host EXTENDED

This command permits, while the module is in command mode, to send data over UDP to a specific remote host including all possible octets (from 0x00 to 0xFF)

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

AT#SENDUDPEXT=<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 **#SENDUDP**, UDP socket has to be previously opened through **#SLUDP** / **#SA**, then we are able to send data to different remote hosts.

Like **#SENDEXT**, 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:

1÷65535 : host port number

<Rai>	integer	N/A	RAI (Release Assistance Indication) configuration
-------	---------	-----	---

Values:

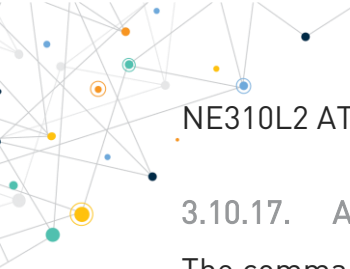
- 1 : Set RAI to: "No further uplink or downlink data transmission subsequent to this transmission"
- 2 : Set RAI to: "Only a single downlink data transmission and no further uplink data transmissions subsequent to this transmission"



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>, <bytestosend>, <remoteIP>, <remotePort> and <Rai>.



3.10.17. AT#SLASTCLOSURE - Detect the Cause of a Socket Disconnection

The command detects the cause of a socket disconnection.

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

AT#SLASTCLOSURE=<connId>

Execution command reports the socket disconnection cause.

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

Additional info:

- ▶ The execution command reports the disconnection cause of the selected socket. The format of the returned message is:

#SLASTCLOSURE: <connId>,<cause>

Name	Type	Default	Description
<cause>	hex	0	socket disconnection cause.

Values:

0 : not available (socket has not yet been closed)

- 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

- i** Any time socket is re-opened, last disconnection cause is reset. Command report 0 (not available).
- i** 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.
- i** 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)
- i** 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.
- i** In case of UDP, cause 2 indicates abnormal (local) disconnection. Cause 3 and 4 are still possible.
(Cause 1 is obviously never possible)



-
- i** 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>**



3.10.18. AT#SS - Socket Status

Execution command reports the current sockets status.

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

AT#SS

Execution command reports the current sockets status using the following message format:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>
[<connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>[...]]

Additional info:

- ▶▶ Parameters meaning.

Name	Type	Default	Description
<connId>	integer	-	socket connection identifier
<state>	integer	0	actual state of the socket

Values:

- 0 : socket closed
- 1 : socket with an active data transfer connection
- 2 : socket suspended
- 3 : socket suspended with pending data
- 4 : socket listening



- 5 : socket with an incoming connection. Waiting for the user accept or shutdown command
- 6 : socket in opening process. The socket is not in Closed state but still not in Active or Suspended or Suspended with pending data state

<locIP>	string	-	IP address associated by the context activation to the socket
<locPort>	integer	-	two meanings: the listening port if we put the socket in listen mode the local port for the connection if we use the socket to connect to a remote machine
<remIP>	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

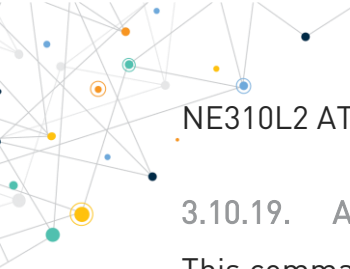
#SS: 6,0

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.



3.10.19. AT#SI - Socket Info

This command is used to get socket information.

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



AT#SI[=<connId>]

Execution command returns information about all sockets data traffic.

Parameter:

Name	Type	Default	Description
<connId>	integer	NA	socket connection identifier. Refer to Additional info sections to have information about the use of the <connId> parameter

Value:

1÷conMax : socket connection identifier. conMax value is returned by test command

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_n>,<sent_n>,<received_n>,<buff_in_n>,<ack_waiting_n>

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
```

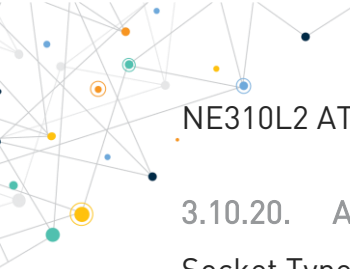
- Assume that sockets 1,2,3 are opened and having some data traffic. To get traffic information only for the socket **<connId>=1** enter the following command:

```
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.



3.10.20. AT#ST - Socket Type

Socket Type

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

AT#ST[=<connId>]

Set command reports the current type of the socket (TCP/UDP) and its direction (Dialer/Listener)

Parameter:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier

Value:

1÷conMAX : socket connection identifier. conMax value is returned by test command

Additional info:

▶▶ The response format is:

#ST: <connId>,<type>,<direction>

Name	Type	Default	Description
<type>	integer	N/A	socket type

Values:

0 : No socket

1 : TCP socket

2 : UDP socket



<direction>	integer	N/A	direction of the socket
-------------	---------	-----	-------------------------

Values:

0 : None

1 : Dialer

2 : Listener

- Issuing **#ST** command without <connId> socket identifier, it returns information about type of all sockets. For each socket, the format of the returned message is:

#ST: <connId_n>,<type_n>,<direction_n><CR><LF>

AT#ST=?

Test command reports the range for parameter <connId>.



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
```

...

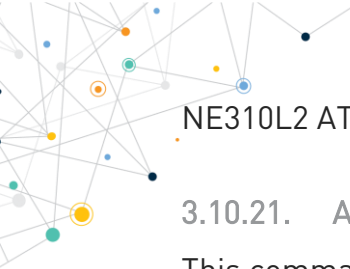
Socket 1 is closed.

Socket 2 is closed.

Socket 3 is an UDP dialer

Socket 4 is an UDP listener

Socket 5 is a TCP dialer



3.10.21. AT#PING - Send PING Request

This command is used to send Ping Echo Request.

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

AT#PING=<IPAddr>[,<retryNum>[,<len>[,<timeout>[,<ttl>[,<pdpld>]]]]]

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: <replyld>,<Ip Address>,<replyTime>,<ttl>

Parameters:

Name	Type	Default	Description
<IPAddr>	string	-	address of the remote host, string type. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query
<retryNum>	integer	4	the number of Ping Echo Request to send
	Value:	1÷64	: Ping Echo Request number
<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

<tll> integer 128 time to live

Value:

1÷255 : time to live

<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
<replyld>	integer	Echo Reply number
<IpAddress>	string	IP address of the remote host
<replyTime>	integer	time, in 100 ms units, required to receive the response



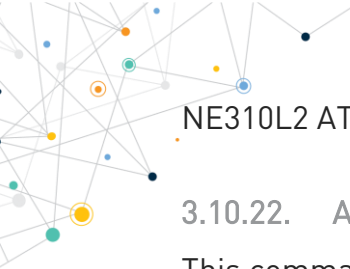
<tll>	integer	time to live of the Echo Reply message
-------	---------	--

- i** When the Echo Request timeout expires (no reply received on time) the response will contain <replyTime> set to 600 and <tll> set to 255.
- i** To receive the corresponding Echo Reply is not required to enable separately **#ICMP**

? 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
```



3.10.22. AT#SCFGEXT3 - Socket Configuration Extended 3

This command sets the socket configuration extended parameters for features not included in **#SCFGEXT** command nor in **#SCFGEXT2** command.

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

 **AT#SCFGEXT3=<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<fastSRING>[,<ssendTimeout>[,<unusedD>]]]]**

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
<immRsp>	integer	0	enables #SD command mode immediate response

Value:

1÷max : socket connection identifier value (max value is returned by the test command)

Values:

0 : **#SD** in command mode (see **#SD**) returns after the socket is connected

1 : **#SD** in command mode returns immediately; then the state of the connection



can be read by the AT
command #SS

<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:<connId1>,<immRsp1>,<closureTypeCmdModeEnabling>,  
<fastsring>,<ssendTimeout>,0<CR><LF>
```

...

```
#SCFGEXT3:<connIdmax>,<immRspmax>,<closureTypeCmdModeEnabling>,  
<fastsring>,<ssendTimeout>,0<CR><LF>
```

 **AT#SCFGEXT3=?**

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

3.11. FTPEasy

3.11.1. AT#FTPAPP - FTP Append

This command is used to append data to an already existing file via FTP during an FTP session.

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

AT#FTPAPP=<fileName>[,<connMode>]

Set command, issued during an FTP connection, opens a data connection and append data to existing <fileName> file.

If the data connection succeeds, a **CONNECT** indication is sent, afterward a **NO CARRIER** indication is sent when the socket is closed.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	the file name
<connMode>	integer	0	the connection mode

Values:

- 0 : online mode
- 1 : command mode

- i** 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**).
- i** Use the escape sequence **+++** to close the data connection.
- i** 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>



3.11.2. AT#FTPAPPEXT - FTP Append Extended

The command sends data on a FTP data port while the module is in command mode.

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

AT#FTPAPPEXT=<bytesToSend>[,<eof>]

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:		
	1÷1500	:	number of bytes
<eof>	integer	0	data port closure

Values:

0 : normal sending of data chunk

1 : close data port after sending data chunk

Additional info:

▶▶ Parameters:

Name	Type	Default	Description
<sentBytes>	integer	N/A	the number of sent bytes

Value:

1÷1500 : number of bytes

i <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
```

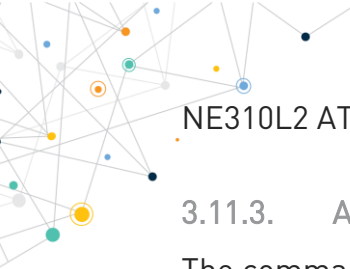
write here the binary data. As soon Size bytes are written, data are sent and
OK is returned and the data socket is closed.

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.



3.11.3. AT#FTPCLOSE - FTP Close Command

The command purpose is to close the previously open FTP connection.

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



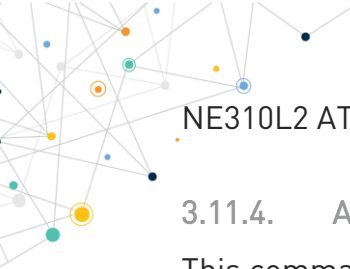
AT#FTPCLOSE

Execution command closes an FTP connection.



AT#FTPCLOSE=?

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



3.11.4. 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	MAX timeout	SELINT
Required	Other	No	-	2

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 st command (maximum length 200 characters)
<respCode1>	integer	N/A	Expected response code from FTP server after <command1> execution

Values:

- 1 : Expected code 1XY
- 2 : Expected code 2XY
- 3 : Expected code 3XY
- 4 : Expected code 4XY
- 5 : Expected code 5XY

<command2>	string	-	name of the 2 nd 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

- i** The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
- i** 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:

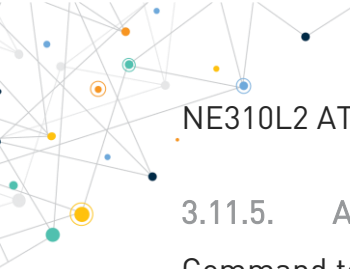
- ▶▶ The format is:
#FTPCMD: <length>, (list of supported <respCode1>s), <length>,
 (list of supported <respCode2>s)

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
...
...



3.11.5. AT#FTPCWD - FTP Change Working Directory

Command to change the working directory on FTP server.

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

AT#FTPCWD=[<dirname>]

Execution command, issued during an FTP connection, changes the working directory on FTP server.

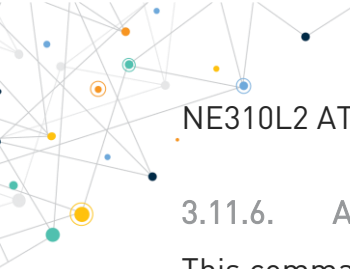
Parameter:

Name	Type	Default	Description
<dirname>	string	-	Name of the new working directory.

- The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

AT#FTPCWD=?

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



3.11.6. AT#FTPDELE - FTP Delete

This command, issued during a FTP connection, allows to delete a file from the remote working directory.

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

AT#FTPDELE=[<filename>]

Execution command, issued during a FTP connection, deletes a file from the remote working directory.

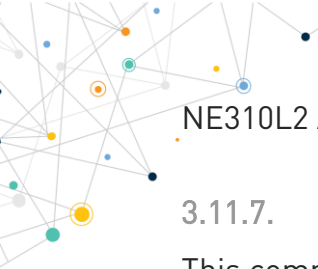
Parameter:

Name	Type	Default	Description
<filename>	string	-	Name of the file that must be deleted

- This command returns an **ERROR** result code if no FTP connection has been opened yet.
- This command returns an **ERROR** result code in case of delayed server response.
If this is the case, the **#FTPMSG** response is temporarily empty; a later check of the **#FTPMSG** response will show the server response.

AT#FTPDELE=?

Test command returns **OK** result code.



3.11.7. AT#FTPGET - FTP Get Command

This command executes the FTP Get function during an FTP connection.

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

AT#FTPGET=[<filename>]

Execution command opens a data connection and starts getting a file from the FTP server. If the data connection succeeds a **CONNECT** indication is sent and the file is received on the serial port.

Parameter:

Name	Type	Default	Description
<filename>	string	-	file name to get from server.

- The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet.
- Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.

AT#FTPGET=?

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



3.11.8. AT#FTPGETPKT - FTP Get in Command Mode

FTP gets in command mode.

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

AT#FTPGETPKT=<fileName>[,<viewMode>]

Execution command, issued during an FTP connection, opens a data connection and starts getting a file from the FTP server while remaining in command mode.

The data port is opened, we remain in command mode and we see the result code **OK**.

Retrieval from FTP server of <fileName> is started, but data are only buffered in the module.



It is possible to read data afterwards issuing **#FTPRECV** command.

Parameters:

Name	Type	Default	Description
<fileName>	string	-	file name. Maximum length: 200 characters.
<viewMode>	integer	0	choose the view mode

Values:

- 0 : text format
- 1 : hexadecimal format

-  The command causes an **ERROR** result code to be returned in case no FTP connection has been opened yet.
-  Command closure should always be handled by application. To avoid download stall situations a timeout should be implemented by the application.

**AT#FTPGETPKT?**

Read command reports current download state for <fileName> with <viewMode> chosen, in the format:

#FTPGETPKT: <remoteFile>,<viewMode>,<eof>

Additional info:

- ▶▶ The following parameter signals the state of the file transmission.

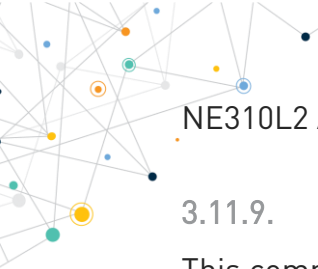
Name	Type	Default	Description
<eof>	integer	N/A	End of file

Values:

- 0 : file currently being transferred
- 1 : complete file has been transferred to FTP client

**AT#FTPGETPKT=?**

Test command returns **OK** result code.



3.11.9. AT#FTPLIST - FTP List

This command is used during a FTP connection.

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

AT#FTPLIST=[<name>]

Execution command, issued during an FTP connection, opens a data connection and starts getting from the server the list of contents of the specified directory or the properties of the specified file

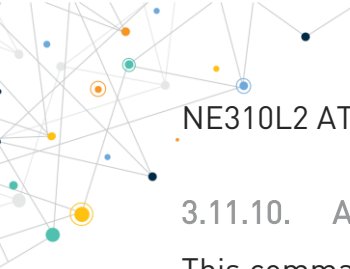
Parameter:

Name	Type	Default	Description
<name>	string	-	is the name of the directory or file

- The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
- Issuing **AT#FTPLIST<CR>** opens a data connection and starts getting from the server the list of contents of the working directory.

AT#FTPLIST=?

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



3.11.10. AT#FTPMSG - FTP Read Message

This command returns the last response received from the FTP server.

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



AT#FTPMSG

Execution command returns the last response received from the server during an FTP connection.



AT#FTPMSG=?

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

3.11.11. AT#FTPOPEN - FTP Connection Opening

This execution command opens an FTP connection toward the FTP server.

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

 **AT#FTPOPEN=[<server:port>,<username>,<password>,<mode>[,<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

- i** 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.
- i** Before opening FTP connection the PDP context must be activated with **#SGACT**.



AT#FTPOPEN=?

Test command returns the **OK** result code



3.11.12. AT#FTPPUT - FTP Send File

This command sends a file to the FTP server.

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

AT#FTPPUT=[<filename>[,<connMode>]]

Execution command, issued during an FTP connection, opens a data connection and starts sending <filename> file to the FTP server.


Parameters:

Name	Type	Default	Description
<filename>	string	-	name of the file (maximum length 200 characters)
<connMode>	integer	0	select online or command mode: If online mode is selected (default) and the data connection succeeds, a CONNECT indication is sent; afterward a NO CARRIER indication is sent when the socket is closed. If command mode is selected and the data connection succeeds, we remain in command mode and we see the result code OK (instead of CONNECT).

Values:

- 0 : online mode
- 1 : command mode

Use the escape sequence **+++** to close the data connection.

-
-  The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.
-

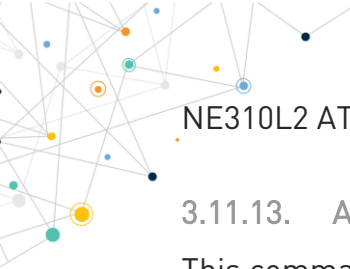
AT#FTPPUT=?

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>



3.11.13. AT#FTPPWD - FTP Print Working Directory


This command, issued during an FTP connection, shows the current working directory on FTP server.

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



AT#FTPPWD

Execution command, issued during an FTP connection, shows the current working directory on FTP server.

-  The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.



AT#FTPPWD=?

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



3.11.14. AT#FTPRECV - Receive Data in Command Mode

The command permits the user to read a given amount of data already transferred via FTP from a remote file.

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



AT#FTPRECV=<blockSize>

Execution command permits the user to transfer at most <blocksize> bytes of remote file, provided that retrieving from the FTP server has been started with a previous **#FTPGETPKT** command, onto the serial port.

This number is limited to the current number of bytes of the remote file which have been transferred from the FTP server.

Parameter:

Name	Type	Default	Description
<blockSize>	integer	N/A	maximum number of bytes to read

Value:

1÷3000 : maximum number of bytes to read

- i** It is necessary to have previously opened FTP data port and started download and buffering of remote file through **#FTPGETPKT** command.
- i** Issuing **#FTPRECV** when there is no FTP data port opened raises an error.
- i** Data port will stay opened if socket is temporary waiting to receive data (**#FTPRECV** returns 0 and **#FTPGETPTK** gives an EOF 0 indication).



AT#FTPRECV?

Read command reports the number of bytes currently transferred from FTP server in the format:

#FTPRECV: <available>

Additional info:

▶▶ Parameter:

Name	Type	Default	Description
<available>	integer	-	number of transferred bytes and available for reading



AT#FTPRECV=?

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



AT#FTPRECV?

#FTPRECV: 3000

OK

Read required part of the buffered data:

AT#FTPRECV=400

#FTPRECV: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 * BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB *

Text row number 12 * CCCCCCCCCCCCCCCCCC

OK

To check when you have received complete file it is possible to use

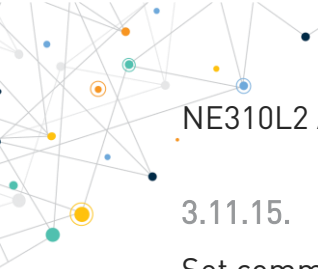
#FTPGETPKT read command:

AT#FTPGETPKT?

#FTPGETPKT:sample.txt,0,1

OK

[you will get <eof> set to 1]



3.11.15. 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	MAX timeout	SELINT
Required	Auto	No	-	2

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.



3.11.16. AT#FTPTO - FTP Time Out

Set the FTP time out.

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

AT#FTPTO=[<tout>]

Set command sets the time out used when opening either the FTP control channel or the FTP traffic channel.

Parameter:

Name	Type	Default	Description
<tout>	integer	100	time out in 100 milliseconds units

Value:

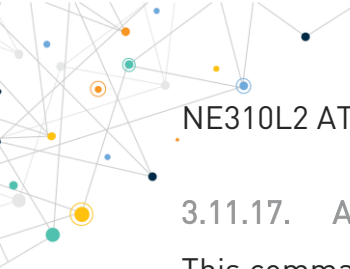
100÷5000 : hundreds of milliseconds

AT#FTPTO?

Read command returns the current FTP operations time out in the format:
#FTPTO: <tout>

AT#FTPTO=?

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



3.11.17. AT#FTPTYPE - FTP Type

This command sets the FTP file transfer type.

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

AT#FTPTYPE=[<type>]

Set command, issued during a FTP connection, sets the file transfer type.


Parameter:

Name	Type	Default	Description
<type>	integer	N/A	file transfer type

Values:

0 : binary

1 : ASCII

-  The command causes an **ERROR** result code to be returned if no FTP connection has been opened yet.

AT#FTPTYPE?

Read command returns the current file transfer type, in the format:

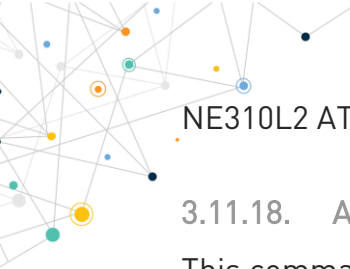
#FTPTYPE: <type>

AT#FTPTYPE=?

Test command returns the range of available values for parameter <type>:

#FTPTYPE: (0,1)





3.11.18. AT#FTPCFG - FTP Configuration

This command sets the time-out used when opening either the FTP control channel or the FTP traffic channel.

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

 **AT#FTPCFG=<tout>,<IPPignoring>[,<FTPSEn>,<FTPext>]]**

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/EPST 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

- i 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>**.



3.12. HTTP

3.12.1. AT#HTTPCFG - Configure HTTP Parameters

This command sets the parameters needed to the HTTP connection.

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

```
➔ AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<user name>
[,<password>[,<ssl_enabled>[,<timeout>[,<cid>[,<pkt_size>[,<unused1>[,<unused 2>]]]]]]]]]]]
```

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	select the profile identifier.
	Value:	0÷2	: Profile identifier
<server_address>	string	-	IP address of the HTTP server. This parameter can be either: <ul style="list-style-type: none"> - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any valid IPv6 address in one of the following format: <ul style="list-style-type: none"> "xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx.xxx" "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" - any host name to be solved with a DNS query. Default: <ul style="list-style-type: none"> "" for first and second profile "m2mlocate.telit.com" for third profile
<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.

<cid> integer - PDP context identifier. See **+CGDCONT** command.

<pkt_size> integer 0 size for data sending (**#HTTPSND**) or receiving (**#HTTPRCV**).

Values:

0 : select automatically value 300

1÷1500 : send or receive size in bytes

<unused1>	integer	-	parameter for future use. Must be set to 0.
<unused2>	integer	-	parameter for future use. Must be set to 0.

- i** A special form of the set command, **AT#HTTPCFG=<prof_id>**, causes the values for profile number **<prof_id>** to reset to default values.
- i** 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>[...]]

?&img alt="Microchip icon" data-bbox="117 553 151 573"/> 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:

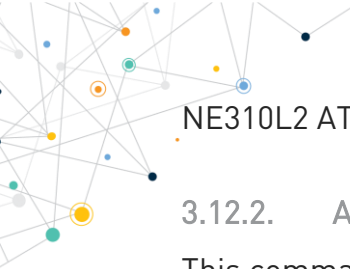
#HTTPCFG:(list of supported <prof_id>s),<s_length>,(list of supported <server_port>s), (list of supported <auth_type>s),<u_length>,<p_length>,(list of supported <ssl_enabled>s),(list of supported <timeout>s),(list of supported <cid>s),(list of supported <pkt_size>s),(0),(0)

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>.



3.12.2. AT#HTTPQRY - Send HTTP GET, HEAD or DELETE Request

This command performs a GET, HEAD or DELETE request to HTTP server.



Standard RFC 2616

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



AT#HTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]

Parameters:

Name	Type	Default	Description
<prof_id>	integer	N/A	profile identifier
	Value:		
	0÷2	:	identifier values
<command>	integer	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:

#HTTTPRING:

<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 **#HTTTPCFG** command, then the URC **#HTTTPRING** **<http_status_code>** parameter has value 0.

Name	Type	Default	Description
<http_status_code>	string	-	is the status code, as received from the server, see RFC 2616
<content_type>	string	-	reports the "Content-Type" header line, as received from the server, see RFC 2616
<data_size>	string	-	is the byte amount of data received from the server. If the server does not report the "Content-Length:" header line, the parameter value is 0.

- ▶▶ To set more than one HTTP header line in parameter **<extra_header_line>**, they have to be separated by ">>"

Example:

AT#HTTTPQRY=0,0,"myURI","Content-Type: xyz">>Authorization: something"

Where:

"myURI" must always start with "/" (slash).

Here an example where **#HTTTPQRY** requests for the homepage of www.myhost.com:

```
AT#HTTPCFG=0,"www.myhost.com",80
OK
AT#HTTPQRY=0,0,"/"
OK
```

- i** If sending ends successfully, the response is **OK**; otherwise an error code is reported.

The HTTP request header sent with **#HTTPQRY** always contains the "Connection: close" line, and it cannot be removed.

AT#HTTPQRY=?

Test command reports the supported range of values for the parameters **<prof_id>** and **<command>** and the maximum length of **<resource>** parameter in the format:

#HTTPQRY:(list of supported <prof_id>s),(list of supported <command>s),<r_length>, <m_length>

Additional info:

- ▶▶ Meaning of **<..._length>** parameters:

Name	Type	Default	Description
<r_length>	integer	-	maximum length of parameter <resource> .
<m_length>	integer	-	maximum length of parameter <extra_header_line> .



3.12.3. AT#HTTPSND - Send HTTP POST or PUT request

This command performs a POST or PUT request to HTTP server and starts sending data to the server.

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



AT#HTTPSND=<profilid>,<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: <profilid>,<httpStatusCode>,<contentType>,<dataSize>

The URC parameters are described in Unsolicited Field section.

Parameters:

Name	Type	Default	Description
<profilid>	integer	N/A	profile identifier
	Value:		
	0÷2	:	profile identifier
<command>	integer	N/A	command requested to HTTP server
	Values:		

0 : POST command

1 : PUT command

<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

Values:

0[:extension] : "application/x-www-form-urlencoded " with optional extension

1[:extension] : "text/plain" with optional extension

2[:extension] : "application/octet-stream" with optional extension

3[:extension] : "multipart/form-data" with optional extension

other : free string corresponding to other content type and possible sub-types

<extraHeaderLine>	string	-	optional HTTP header line
--------------------------------	--------	---	---------------------------

Unsolicited fields:

Name	Type	Description
<statusCode>	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)

<dataSize>	integer	byte amount of data received from the server (if the server doesn't report the "Content-Length:" header line, the parameter value is 0)
-------------------------	---------	---

- i** The HTTP request header sent with **#HTTPSND** always contains the "Connection: close" line, and it cannot be removed.
- i** If there are no data from server or the server doesn't answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING** **<http_status_code>** parameter will have value 0.

? AT#HTTPSND=?

Test command returns the supported range of parameters **<profilId>**, **<command>** and **<dataLen>** and the maximum length of **<resource>**, **<postParam>** and **<extraHeaderLine>** string parameters in the format:

HTTPSND: (list of supported **<profilId>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"`
`>>>`



3.12.4. AT#HTTPCV - Receive HTTP Server Data

This command permits the user to read data from HTTP server in response to a previous HTTP module request.

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

AT#HTTPCV=<profilId>[,<maxByte>]

The module is notified of these data by the **#HTTTPRING** 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,	:	0 means infinite size.
	64÷1500		

-  If <maxByte> is unspecified, server data will be transferred all in once.
-  If the data are not present or the **#HTTTPRING** <httpStatusCode> parameter has value 0, an error code is reported.



?  **AT#HTTPCR=?**

Test command reports the supported range of values for **<profilid>** and **<maxByte>** parameters in the format:

HTTPRCV: {list of supported **<profilid>s,<maxByte>**}

3.13. CloT Optimization

3.13.1. 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	MAX timeout	SELINT
Not required	Auto	No	-	2



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:

0 : Disable reporting

1 : Enable reporting

3 : Disable reporting and reset the parameters for CloT EPS optimization to the default values

<supportedUEopt>	integer	3	indicates the UE's support for CloT EPS optimizations.
-------------------------------	---------	---	--

Values:

- 0 : No support
- 1 : Support for control plane CloT EPS optimization
- 2 : Support for user plane CloT EPS optimization
- 3 : Support for both control plane CloT EPS optimization and user plane CloT EPS optimization (default value for modules supporting NBloT technology)

<preferredUEopt>	integer	0	indicates the UE's preference for CloT EPS optimizations.
-------------------------------	---------	---	---

Values:

- 0 : No preference
- 1 : Preference for control plane CloT EPS optimization
- 2 : Preference for user plane CloT EPS optimization

Unsolicited field:

Name	Type	Description
<supportedNetworkopt>	integer	indicates the Network support for CloT EPS optimizations.
		Values:



-
- 0 : No support.
 - 1 : Support for control plane CloT EPS optimization
 - 2 : Support for user plane CloT EPS optimization
 - 3 : Support for both control plane CloT EPS optimization and user plane CloT EPS optimization
-



AT+CCIOTOPT?

Read command returns the current parameter values in the format:

+CCIOTOPT :<n>,<supportedUEopt>,<preferredUEopt>



AT+CCIOTOPT=?

Test command reports the range for the parameters in the format:

+CCIOTOPT: (list of supported <n>s),(list of supported <supportedUEopt>s),(list of supported <preferredUEopt>s)

3.14. MQTT

3.14.1. AT#MQEN - Enable MQTT Feature

This command initializes a MQTT client and allocates the necessary resources.

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



AT#MQEN=<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:			
		1÷maxClients	: client instance range. To know maxClients value use test command
<enable>	integer	N/A	selects if client must be activated or deactivated

Values:

0 : disable

1 : enable



AT#MQEN?

Read command returns the status of the MQTT stack in the format

#MQEN: <instanceNumber>,<enabled>

 **AT#MQEN=?**

Test command reports the available range of values for parameters.



Read command

```
AT#MQEN?
```

```
#MQEN: 1,1
```

```
#MQEN: 2,0
```

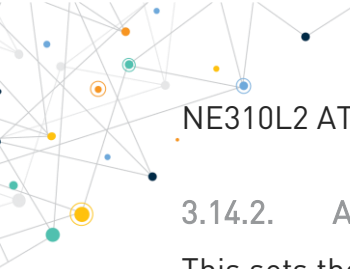
```
OK
```

Test command

```
AT#MQEN=?
```

```
#MQEN: (1-maxClients),(0-1)
```

```
OK
```



3.14.2. AT#MQCFG - Configure MQTT Parameters

This sets the connection parameters for the selected MQTT client.

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

 **AT#MQCFG=<instanceNumber>,<hostname>,<port>,<cid>[,<sslEn>]**

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			



<code><sslEn></code>	integer	0	enable/disable SSL
----------------------------	---------	---	--------------------

Values:

0 : disable

1 : enable



AT#MQCFG?

Read command returns the configuration of all active MQTT clients in the format:

#MQCFG: `<instanceNumber>,<hostname>,<port>,<cid>[,<sslEn>]`



AT#MQCFG=?

Test command reports the available range of values for parameters.



- SSL disabled (by default)
`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)  
OK
```

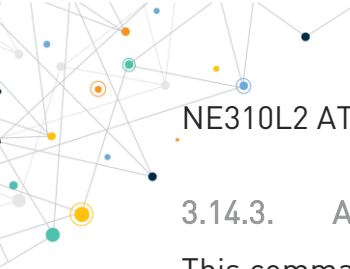
- SSL enabled
`AT#MQCFG=1,api.mybroker.com,8883,3,1`
OK

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)  
OK
```



3.14.3. AT#MQDISC - Log Out and Disconnect from the MQTT Broker

This command performs the logout and disconnection from to the MQTT broker.

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

AT#MQDISC=<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:

1÷maxClients : client instance range. To know maxClients value use test command

AT#MQDISC=?

Test command reports the available range of values for parameters.

AT#MQDISC=1 OK

Test command
AT#MQDISC=?
#MQDISC: (1-maxClients)
OK

3.14.4. AT#MQCONN - Connect and Log in the MQTT Broker

This command performs the connection and login to the MQTT broker.

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

 **AT#MQCONN=<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:			
	1÷maxClients	:	client instance range. To know maxClients value use test command
<clientID>	string	-	identifies each MQTT client that connects to the MQTT broker. Maximum length of <clientID> is 100.
<userName>	string	-	authentication and authorization. Maximum length of <userName> is 512.
<passWord>	string	-	authentication and authorization. Maximum length of <passWord> is 512.

- i** 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),100,512,512
```

```
OK
```

Scenario (2)

Read command

```
AT#MQCONN?
```

```
#MQCONN: 1,2
```

```
OK
```

Set command

```
AT#MQDISC=1
```

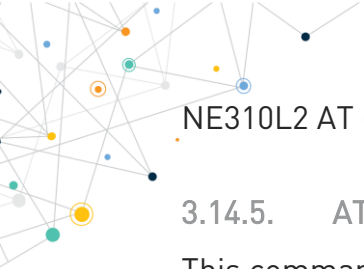
```
OK
```

Read command

```
AT#MQCONN?
```

```
#MQCONN: 1,0
```

```
OK
```



3.14.5. AT#MQCFG2 - Configure Additional MQTT Parameters

This command sets the optional connection parameters for the selected MQTT client.

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

 **AT#MQCFG2=<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: 1÷maxClients : client instance range. To know maxClients value use test command
<keepAlive>	integer	20	timeout of periodic packet to keep connection open Value: 1÷3600 : timeout expressed in sec
<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=?

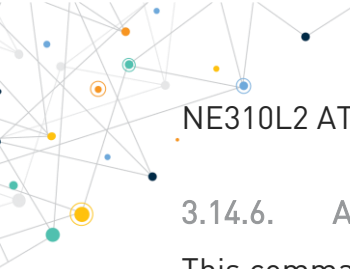
Test command reports the available range of values for parameters.



```
AT# MQCFG2=1,20,1
OK
```

```
Read command
AT#MQCFG2?
#MQCFG2: 1,20,1
#MQCFG2: 2,30,1
OK
```

```
Test command
AT#MQCFG2=?
#MQCFG2: (1-maxClients),(1-3600),(0-1)
```

3.14.6. AT#MQWCFG - Configure MQTT Last Will and Testament

This command sets Last Will and Testament for the selected MQTT client.

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

 **AT#MQWCFG=<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:			
1÷maxClients : client instance range. To know maxClients value use test command			
<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:			
0 : the client does not need to specify a Last Will and Testament			
1 : the client needs to specify a Last Will and Testament			
<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
```

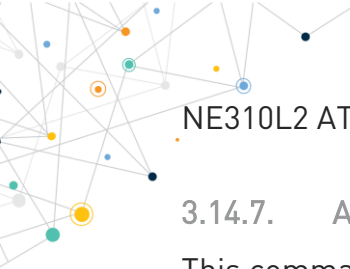
```
AT#MQWCFG=1,1,1,2,myLastWillTopic,myLastWillMessage  
OK
```

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
```



3.14.7. 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	MAX timeout	SELINT
Required	No	No	-	2

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:			
	1÷maxClients	:	client instance range. To know maxClients value use test command
<pktTimeout>	integer	10	timeout of the packet delivery
Value:			
	1÷60	:	timeout range. Value expressed in seconds

AT#MQTCFG?

Read command returns the timeout configuration of all active MQTT clients in the format

#MQTCFG: <instanceNumber>,<pktTimeout>

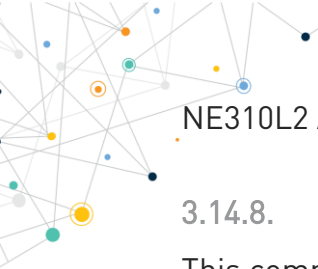
AT#MQTCFG=?

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



3.14.8. AT#MQUNS - Unsubscribe from a Topic

This command revokes the subscription to a MQTT topic.

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

AT#MQUNS=<instanceNumber>,<topic>

Parameters:

Name	Type	Default	Description
<instanceNumber>	string	N/A	selects the client instance to activate or deactivate

Value:

1÷maxClients : client instance range. To know maxClients value use test command

<topic>	string	-	name of the topic. Maximum length of <topic> is 256.
---------	--------	---	---

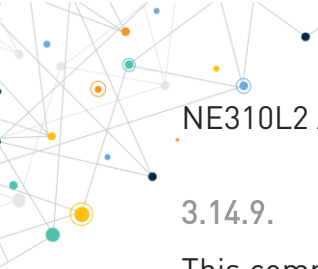
AT#MQUNS=?

Test command reports the available range of values for parameters.

```

</> AT#MQUNS=1,topicToUnsubscribe
OK
Test command
AT#MQUNS=?
#MQUNS: {1-maxClients},
OK

```



3.14.9. AT#MQSUB - Subscribe to a Topic

This command performs the subscription to a MQTT topic

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

AT#MQSUB=<instanceNumber>,<topic>

Parameters:

Name	Type	Default	Description
<instanceNumber>	integer	N/A	selects the client instance to activate or deactivate

Value:

1÷maxClients : client instance range. To know maxClients value use test command

<topic>	string	-	name of the topic. Maximum length of <topic> is 256.
---------	--------	---	---

AT#MQSUB=?

Test command reports the available range of values for parameters.

AT#MQSUB=1,topicToSubscribe OK

Test command

AT#MQSUB=?

#MQSUB: (1-maxClients),256

OK





3.14.10. AT#MQPUBS - Publish ASCII String

This command publishes an ASCII string to the specified MQTT topic.

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

 **AT#MQPUBS=<instanceNumber>,<topic>,<retain>,<qos>,<message>**

Parameters:

Name	Type	Default	Description
<instanceNumber>	string	N/A	selects the client instance to activate or deactivate
Value:			
1÷maxClients : client instance range. To know maxClients value use test command			
<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 : retain			
1 : no retain			
<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.



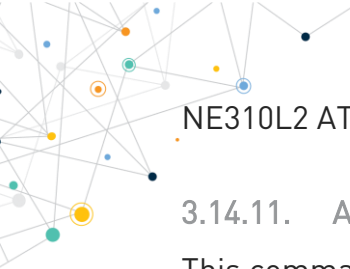
Maximum length of **<message>** can go up to 65536 depending on system memory available.

 **AT#MQPUBS=?**

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



3.14.11. AT#MQREAD - Read Messages Received from the MQTT Broker

This command reads the message payload from the queue slot provided.

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

 **AT#MQREAD=<instanceNumber>,<mld>**

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:		
	1÷maxClients	:	client instance range. To know maxClients value use test command
<mld>	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#MQREAD?

Read command returns the unread messages count for each instance number for all active MQTT clients in the format:

#MQREAD: <instanceNumber>,<unread>

 **AT#MQREAD=?**

Test command reports the available range of values for parameters.

```
</> AT#MQREAD=1,2
#MQREAD: 1,myTopic,10
<<<
0123456789
```

Read command

```
AT#MQREAD?
#MQREAD: 1,0
#MQREAD: 2,3
OK
```

Test command

```
AT#MQREAD=?
#MQREAD: (1-maxClients),(1-30)
OK
```



3.15. PSM (Power Saving Mode)

3.15.1. AT+CPSMS - Power Saving Mode Setting

This command enables/disables Power Saving Mode (PSM) mode.



[1] 3GPP TS 27 007

[2] 3GPP TS 24.008

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



AT+CPSMS=[<mode>[,<ReqPeriodicRAU>[,<ReqGPRSreadyTimer>[,<ReqPeriodicTAU>[,<ReqActiveTime>]]]]]

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value.


Parameters:

Name	Type	Default	Description
<mode>	integer	0	disables or enables the use of PSM in the UE.
Values:			
	0	:	Disable
	1	:	Enable
<ReqPeriodicRAU>	string	-	one byte in an 8 bit format. Requested extended periodic RAU value (T3312) 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.

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.



3.15.2. AT#CPSMS - Power Saving Mode Setting

This command enables/disables Power Saving Mode (PSM) mode.

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

 **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.
Values:			
		0	: disable
		1	: enable
<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	N/A	bitmask to indicate PSM modes. Each bit is configured independently. Default value: <psmValue>=4

Values:

- 0 : PSM without network coordination
- 1 : Rel 12 PSM without context retention
- 2 : Rel 12 PSM with context retention
- 3 : PSM in between eDRX cycles

<psmThreshold>	integer	60	Minimum duration threshold (in sec) to enter PSM. Minimum value is 60 seconds.
-----------------------------	---------	----	--

Value:

- 60 : Minimum value of duration threshold

- i** 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.

 **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>

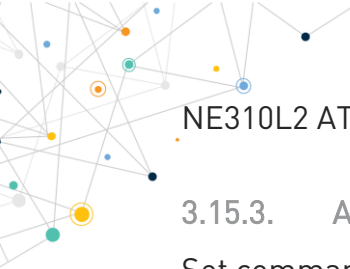
Additional info:

- ▶▶ Meaning of the returned parameters.

Name	Type	Default	Description
<status>	integer	0	PSM status in the network
Values:			
0 : PSM disabled			
1 : PSM enabled			
<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.



3.15.3. 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	MAX timeout	SELINT
Required	Common profile	No	-	2

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.

3.16. Debugging

3.16.1. AT#TRACE - Enable/Disable Trace

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

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

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

Parameters:

Name	Type	Default	Description
<mode>	integer	0	switches all trace outputs ON or OFF. If parameter <mode> is no entered in the command, the following <configurationString> will be used.
<p>Values:</p> <p>0 : sets all trace outputs OFF, <configuration String> will be ignored</p> <p>1 : sets all trace outputs ON, <configurationString> will be ignored</p>			
<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
<code><unit></code>	string	N/A	trace class name available to the user to select the trace output. On the right side of each name, in lower case characters, there is the TC_XXX... string (Trace Class name) shown by the debugging tool.

Values:

generic	:	TC_GENERIC
socket	:	TC_SOCKET
clock	:	TC_CLOCK
pdp	:	TC_PDP
gnss	:	TC_GNSS
m2m_user	:	TC_M2M_USER
fota	:	TC_FOTA
fs	:	TC_FS
qmi	:	TC_QMI
sms	:	TC_SMS
info	:	TC_INFO
lwm2m	:	TC_LWM2M
net	:	TC_NET
sim	:	TC_SIM
spi	:	TC_SPI



usb	:	TC_USB,
nv	:	TC_NV
rtc	:	TC_RTC
m2m_uart	:	TC_UART
power	:	TC_POWER
ftpc	:	TC_FTPC
ati	:	TC_ATI
backup	:	TC_BACKUP
nipd	:	TC_NIPD
sys	:	TC_SYS
psm	:	TC_PSM
ssl	:	TC_SSL

<umode>	integer	0	enables/disables the trace output selected
----------------------	---------	---	--

Values:

0 : disables

1 : enables



AT#TRACE?

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

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



AT#TRACE=?

Test command returns **OK**.



Here are some examples:

- Set all trace outputs OFF
AT#TRACE=0
OK
- Set all trace outputs ON
AT#TRACE=1
OK
- Enable/disable trace outputs selected
AT#TRACE=,"generic=1,clock=0,lwm2m=1,pdp=0,gnss=0,ati=0"
OK



4. PRODUCT AND SAFETY INFORMATION

4.1. Copyrights and Other Notices

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

Although reasonable efforts have been made to ensure the accuracy of this document, Telit assumes no liability resulting from any inaccuracies or omissions in this document, or from the use of the information contained herein. The information in this document has been carefully checked and is believed to be reliable. Telit reserves the right to make changes to any of the products described herein, to revise it and to make changes from time to time with no obligation to notify anyone of such revisions or changes. Telit does not assume any liability arising from the application or use of any product, software, or circuit described herein; neither does it convey license under its patent rights or the rights of others.

This document may contain references or information about Telit's products (machines and programs), or services that are not announced in your country. Such references or information do not necessarily mean that Telit intends to announce such Telit products, programming, or services in your country.

4.1.1. Copyrights

This instruction manual and the Telit products described herein may include or describe Telit's copyrighted material, such as computer programs stored in semiconductor memories or other media. Laws in Italy and in other countries reserve to Telit and its licensors certain exclusive rights for copyrighted material, including the exclusive right to copy, reproduce in any form, distribute and make derivative works of the copyrighted material. Accordingly, any of Telit's or its licensors' copyrighted material contained herein or described in this instruction manual, shall not be copied, reproduced, distributed, merged or modified in any manner without the express written permission of the owner. Furthermore, the purchase of Telit's products shall not be deemed to grant in any way, neither directly nor by implication, or estoppel, any license.

4.1.2. Computer Software Copyrights

Telit and the 3rd Party supplied Software (SW) products, described in this instruction manual may include Telit's and other 3rd Party's copyrighted computer programs stored in semiconductor memories or other media. Laws in Italy and in other countries reserve to Telit and other 3rd Party SW exclusive rights for copyrighted computer programs, including – but not limited to - the exclusive right to copy or reproduce in any form the



copyrighted products. Accordingly, any copyrighted computer programs contained in Telit's products described in this instruction manual shall not be copied (reverse engineered) or reproduced in any manner without the express written permission of the copyright owner, being Telit or the 3rd Party software supplier. Furthermore, the purchase of Telit products shall not be deemed to grant either directly or by implication, estoppel, or in any other way, any license under the copyrights, patents or patent applications of Telit or other 3rd Party supplied SW, except for the normal non-exclusive, royalty free license to use arising by operation of law in the sale of a product.

4.2. Usage and Disclosure Restrictions

4.2.1. License Agreements

The software described in this document is owned by Telit and its licensors. It is furnished by express license agreement only and shall be used exclusively in accordance with the terms of such agreement.

4.2.2. Copyrighted Materials

The Software and the documentation are copyrighted materials. Making unauthorized copies is prohibited by the law. The software or the documentation shall not be reproduced, transmitted, transcribed, even partially, nor stored in a retrieval system, nor translated into any language or computer language, in any form or by any means, without prior written permission of Telit.

4.2.3. High Risk Materials

Components, units, or third-party goods used in the making of the product described herein are NOT fault-tolerant and are NOT designed, manufactured, or intended for use as on-line control equipment in the following hazardous environments requiring fail-safe controls: operations of Nuclear Facilities, Aircraft Navigation or Aircraft Communication Systems, Air Traffic Control, Life Support, or Weapons Systems ("High Risk Activities"). Telit and its supplier(s) specifically disclaim any expressed or implied warranty of fitness eligibility for such High Risk Activities.

4.2.4. Trademarks

TELIT and the Stylized T-Logo are registered in the Trademark Office. All other product or service names are property of their respective owners.

4.2.5. 3rd Party Rights

The software may include 3rd Party's software Rights. In this case the user agrees to comply with all terms and conditions imposed in respect of such separate software rights. In addition to 3rd Party Terms, the disclaimer of warranty and limitation of liability provisions in this License, shall apply to the 3rd Party Rights software as well.

TELIT HEREBY DISCLAIMS ANY AND ALL WARRANTIES EXPRESSED OR IMPLIED FROM ANY 3RD PARTY REGARDING ANY SEPARATE FILES, ANY 3RD PARTY MATERIALS INCLUDED IN THE SOFTWARE, ANY 3RD PARTY MATERIALS FROM WHICH THE SOFTWARE IS DERIVED (COLLECTIVELY "OTHER CODES"), AND THE USE OF ANY OR ALL OTHER CODES IN CONNECTION WITH THE SOFTWARE, INCLUDING (WITHOUT LIMITATION) ANY WARRANTIES OF SATISFACTORY QUALITY OR FITNESS FOR A PARTICULAR PURPOSE.

NO 3RD PARTY LICENSORS OF OTHER CODES MUST BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION LOST OF PROFITS), HOWEVER CAUSED AND WHETHER MADE UNDER CONTRACT, TORT OR OTHER LEGAL THEORY, ARISING IN ANY WAY OUT OF THE USE OR DISTRIBUTION OF THE OTHER CODES OR THE EXERCISE OF ANY RIGHTS GRANTED UNDER EITHER OR BOTH THIS LICENSE AND THE LEGAL TERMS APPLICABLE TO ANY SEPARATE FILES, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

4.2.6. Waiver of Liability

IN NO EVENT WILL TELIT AND ITS AFFILIATES BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY INDIRECT DAMAGE OF ANY KIND WHATSOEVER, INCLUDING BUT NOT LIMITED TO REIMBURSEMENT OF COSTS, COMPENSATION OF ANY DAMAGE, LOSS OF PRODUCTION, LOSS OF PROFIT, LOSS OF USE, LOSS OF BUSINESS, LOSS OF DATA OR REVENUE, WHETHER OR NOT THE POSSIBILITY OF SUCH DAMAGES COULD HAVE BEEN REASONABLY FORESEEN, CONNECTED IN ANY WAY TO THE USE OF THE PRODUCT/S OR TO THE INFORMATION CONTAINED IN THE PRESENT DOCUMENTATION, EVEN IF TELIT AND/OR ITS AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE OR FOR CLAIMS BY ANY THIRD PARTY.

4.3. Safety Recommendations

Make sure the use of this product is allowed in your country and in the environment required. The use of this product may be dangerous and has to be avoided in areas where:



- it can interfere with other electronic devices, particularly in environments such as hospitals, airports, aircrafts, etc.
- there is a risk of explosion such as gasoline stations, oil refineries, etc. It is the responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conformed to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible for the functioning of the final product. Therefore, the external components of the module, as well as any project or installation issue, have to be handled with care. Any interference may cause the risk of disturbing the GSM network or external devices or having an impact on the security system. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed carefully in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm). In case this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The equipment is intended to be installed in a restricted area location.

The equipment must be supplied by an external specific limited power source in compliance with the standard EN 62368-1:2014.

The European Community provides some Directives for the electronic equipment introduced on the market. All of the relevant information is available on the European Community website:

https://ec.europa.eu/growth/sectors/electrical-engineering_en

5. GLOSSARY

ARFCN	Absolute Radio Frequency Channel Number
AT	Attention command
BA	BCCH Allocation
BCCH	Broadcast Control Channel
CA	Cell Allocation
CBM	Cell Broadcast Message
CBS	Cell Broadcast Service
CCM	Current Call Meter
CLIR	Calling Line Identification Restriction
CTS	Clear To Send
CUG	Closed User Group
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DCS	Digital Cellular System
DGPS	Differential GPS, the use of GPS measurements, which are differentially corrected
DNS	Domain Name System
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready
GGA	GPS Fix data
GLL	Geographic Position – Latitude/Longitude
GLONASS	Global positioning system maintained by the Russian Space Forces
GMT	Greenwich Mean Time
GNSS	Any single or combined satellite navigation system (GPS, GLONASS and combined GPS/GLONASS)
GPRS	Global Packet Radio Service
GPS	Global Positioning System
GSA	GPS DOP and Active satellites
GSM	Global System Mobile
GSV	GPS satellites in view



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	<i>either</i> Mobile Terminated <i>or</i> 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



6. DOCUMENT HISTORY

Revision	Date	Changes
3	2022-01-20	<p>New commands: AT&D, AT+IPR, AT+IFC, AT#CEERNET, AT#CEERNETEXT, AT#HTTPCFG, AT#HTTPQRY, AT#HTTPSND, AT#HTTPCV, AT#MQEN, AT#MQCFG, AT#MQCFG2, AT#MQWCFG, AT#MQTCFG, AT#MQCONN, AT#MQDISC, AT#MQSUB, AT#MQUNS, AT#MQPUBS, AT#PORTCFG</p> <p>Updated commands: AT&K, AT#CSURV, AT#GPIO</p>
2	2021-11-16	<p>Reviewed list of supported commands to align to latest beta</p> <p>New commands: AT+CEER, AT#FWSWITCH, AT&C, AT+CREG, AT#RFSTS, AT#BND, AT#IOTBND, AT+CTZR, AT+CPMS, AT+CGREG, AT+CCID, AT#CCID, AT+ICCID, AT#TRACE</p> <p>Updated commands: AT+CSCS, ATQ, AT&K, AT#MONI, AT+CEDRXS, AT+CRCES, AT+CCLK, AT+CPBW, AT+CGEREP, AT+CSODCP, AT+CRTDCP, AT+CCHO, AT#GPIO, AT#SL, AT#SLUDP, AT#CSURV, AT+CPSMS, AT#CPSMS, ATD</p>
1	2021-09-14	<p>Complete revision of command description structure</p> <p>Reviewed list of supported commands to align to latest beta</p>
0	2021-04-30	First issue




Connect to our site and contact our technical support team for any question

www.telit.com



Telit



Telit reserves all rights to this document and the information contained herein. Products, names, logos and designs described herein may in whole or in part be subject to intellectual property rights. The information contained herein is provided "as is". No warranty of any kind, either express or implied, is made in relation to the accuracy, reliability, fitness for a particular purpose or content of this document. This document may be revised by Telit at any time. For most recent documents, please visit www.telit.com

Copyright © 2022, Telit