



LE910S1

AT Commands Reference Guide

80672ST11051A Rev. 13 – 2022-09-14



APPLICABILITY TABLE

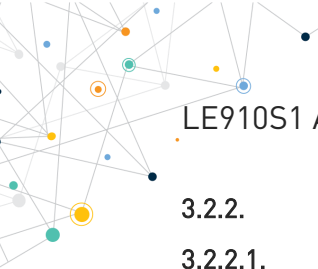
PRODUCTS
LE910S1-EA
LE910S1-EAG
LE910S1-ELG

SOFTWARE
39.00.xx2



CONTENTS

APPLICABILITY TABLE	2
1. INTRODUCTION	12
1.1. Scope	12
1.2. Audience	12
1.3. Contact Information, Support	12
1.4. Symbol Convention	13
2. COMMANDS	15
2.1. Definitions	15
2.2. AT Command Syntax	16
2.2.1. String Type Parameters	17
2.2.2. Command Lines	17
2.2.2.1. ME Error Result Code - +CME ERROR: <err>	18
2.2.2.2. Message Service Failure Result Code - +CMS ERROR: <err>	26
2.2.2.3. Carriage Returns, Line Feeds and Log	28
2.2.3. Information Responses and Result Codes	28
2.2.4. Command Response Time-Out	29
2.2.5. Command Issuing Timing	30
2.3. Storage	30
2.3.1. Factory Profile and User Profiles	30
2.4. AT Command Short Overview Table	32
3. AT COMMANDS REFERENCES	33
3.1. Call & DTMF	33
3.1.1. AT+CHUP - Hang Up Call	33
3.1.2. AT+CRLP - Radio Link Protocol	34
3.1.3. AT+CRC - Cellular Result Codes	36
3.1.4. AT+CVHU - Voice Hung Up Control	38
3.1.5. AT+CSTA - Select Type of Address	39
3.1.6. AT+FCLASS - Select Active Service Class	41
3.1.7. AT+VTS - DTMF Tones Transmission	43
3.1.8. AT+VTD - Tone Duration	45
3.2. General Control and Config	47
3.2.1. Command Line Prefixes	47
3.2.1.1. AT - Starting a Command Line	47
3.2.1.2. A/ - Last Command Automatic Repetition	48

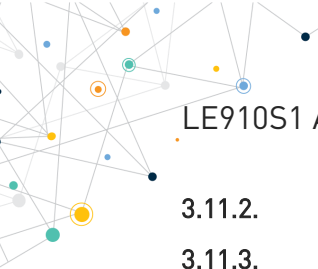


3.2.2.	Generic Modem Control	49
3.2.2.1.	AT&F - Set to Factory-Defined Configuration	49
3.2.2.2.	ATZ - Soft Reset	50
3.2.2.3.	AT&Y - Default Reset Basic Profile Designation	51
3.2.2.4.	AT&P - Default Reset Full Profile Designation	52
3.2.2.5.	AT&W - Store Current Configuration	53
3.2.2.6.	AT&V - Display some Configuration and Profile	54
3.2.2.7.	AT+GCAP - Capabilities List	56
3.2.2.8.	AT+GMI - Manufacturer Identification	57
3.2.2.9.	AT+GMM - Model Identification	58
3.2.2.10.	AT+GMR - Revision Identification	59
3.2.2.11.	AT+GSN - Serial Number	60
3.2.2.12.	AT+CGMI - Request Manufacturer Identification	62
3.2.2.13.	AT+CGMM - Request Model Identification	63
3.2.2.14.	AT+CGMR - Request Revision Identification	64
3.2.2.15.	AT+CGSN - Request Product Serial Number Identification	65
3.2.2.16.	AT#CGSN - Product Serial Number Identification	67
3.2.2.17.	AT#SWPKG - Request Software Package Version	69
3.2.2.18.	AT+CPAS - Phone Activity Status	71
3.2.2.19.	AT+CFUN - Set Phone Functionality	73
3.2.2.20.	AT+CIND - Indicator Control	77
3.2.2.21.	AT+CACM - Accumulated Call Meter	81
3.2.2.22.	AT+CAMM - Accumulated Call Meter Maximum	83
3.2.2.23.	AT+CCWE - Call Meter Maximum Event	85
3.2.2.24.	AT+CLAC - Available AT Commands	87
3.2.2.25.	AT+CMEE - Report Mobile Equipment Error	88
3.2.2.26.	AT+CEER - Extended Error Report	90
3.2.2.27.	AT+CSCS - Select TE Character Set	91
3.2.2.28.	AT+CMUX - Multiplexing Mode	93
3.2.2.29.	AT#CMUXMODE - CMUX Mode Set	96
3.2.2.30.	AT+CPUC - Price per Unit and Currency Table	98
3.2.2.31.	AT#PDPAUTH - PDP Authentication Parameters	100
3.2.2.32.	AT#TXCALD - Change TX Power Level for a Supported Band	102
3.2.2.33.	AT#TXCAL4GD - Change Max TX Power Level for a Supported Band	104
3.2.3.	S Parameters	106
3.2.3.1.	ATS0 - Number of Rings to Auto Answer	106
3.2.3.2.	ATS2 - Escape Character	108

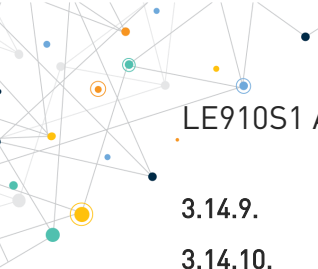
3.2.3.3.	ATS3 - Command Line Termination Character	109
3.2.3.4.	ATS4 - Response Formatting Character	111
3.2.3.5.	ATS5 - Command Line Editing Character	113
3.2.4.	DTE - Modem Interface Control	115
3.2.4.1.	ATE - Command Echo	115
3.2.4.2.	ATQ - Quiet Result Codes	117
3.2.4.3.	ATV - Response Format	119
3.2.4.4.	ATI - Identification Information	121
3.2.4.5.	AT&C - Data Carrier Detect (DCD) Control	122
3.2.4.6.	AT&D - Data Terminal Ready (DTR) Control	123
3.2.4.7.	AT+IPR - UART DCE Interface Data Rate Speed	125
3.2.4.8.	AT+IFC - DTE-Modem Local Flow Control	128
3.2.4.9.	ATX - Extended Result Codes	130
3.2.5.	Call (Voice and Data) Control	132
3.2.5.1.	ATD - Dialup Connection	132
3.2.5.2.	ATA - Answer Incoming call	134
3.2.5.3.	ATH - Hang Up/Disconnect the Current Call	135
3.2.5.4.	ATO - Return to ON-Line Mode	136
3.3.	Network	137
3.3.1.	AT+COPN - Read Operator Names	137
3.3.2.	AT+CREG - Network Registration Status	139
3.3.3.	AT+COPS - Operator Selection	143
3.3.4.	AT+CLCK - Facility Lock/Unlock	148
3.3.5.	AT+CPWD - Change Facility Password	152
3.3.6.	AT+CLIR - Calling Line Identification Restriction	156
3.3.7.	AT+COLP - Connected Line Identification Presentation	159
3.3.8.	AT+CCFC - Call Forwarding Number And Condition	161
3.3.9.	AT+CCWA - Call Waiting	165
3.3.10.	AT+CHLD - Call Holding Services	169
3.3.11.	AT+CDIP - Called line identification presentation	171
3.3.12.	AT+CUSD - Unstructured Supplementary Service Data	174
3.3.13.	AT+CAOC - Advice of Charge	177
3.3.14.	AT+CLCC - List Current Calls	179
3.3.15.	AT+CSSN - SS Notification	182
3.3.16.	AT+CPOL - Preferred Operator List	185
3.3.17.	AT+CPLS - Selection of Preferred PLMN List	188
3.3.18.	AT+CSQ - Signal Quality	190

3.3.19.	AT#SERVINFO - Serving Cell Information	194
3.3.20.	AT#AUTOBND - Automatic Band Selection	198
3.3.21.	AT+CEMODE - Set Mode of Operation for EPS	199
3.3.22.	AT+CESQ - Extended Signal Quality	201
3.3.23.	AT+WS46 - PCCA STD-101 Select Wireless Network	205
3.3.24.	AT+CEREG - EPS Network Registration Status	207
3.3.25.	AT#RFSTS - Read Current Network Status	210
3.3.26.	AT#MONI - Cell Monitor	214
3.3.27.	AT+CLIP - Calling Line Identification Presentation	220
3.4.	SIM	223
3.4.1.	AT+SWITCHSIM - Set master SIM	223
3.4.2.	AT+CPIN - Enter the PIN	225
3.4.3.	AT#PCT - Display PIN Counter	230
3.4.4.	AT+CIMI - International Mobile Subscriber Identity (IMSI)	232
3.4.5.	AT#SIMDET - SIM Detection Mode	233
3.4.6.	AT#CCID - Read ICCID	236
3.4.7.	AT+CRSM - Restricted SIM access	237
3.4.8.	AT+CSIM - Generic SIM Access	241
3.4.9.	AT+CCHO - Open Logical Channel	244
3.4.10.	AT+CCHC - Close Logical Channel	246
3.4.11.	AT+CGLA - Generic UICC Logical Channel Access	248
3.4.12.	AT+ICCID - Read ICCID	251
3.4.13.	AT#SIMINCFG - SIMIN Pin Configuration	252
3.5.	SIM Toolkit	254
3.5.1.	AT#STIA - SIM/USIM Toolkit Interface Action	254
3.5.2.	AT#STGI - SIM Toolkit Get Information	260
3.5.3.	AT#STSR - SIM Toolkit Send Response	269
3.6.	SMS & CB	272
3.6.1.	AT+CSMS - Select Message Service	272
3.6.2.	AT+CPMS - Preferred Message Storage	275
3.6.3.	AT+CMGF - Message Format	278
3.6.4.	AT+CSCA - Service Center Address	280
3.6.5.	AT+CSMP - Set Text Mode Parameters	283
3.6.6.	AT+CSDH - Show Text Mode Parameters	288
3.6.7.	AT+CSCB - Select Cell Broadcast	290
3.6.8.	AT+CSAS - Save Settings	292
3.6.9.	AT+CRES - Restore Settings	294

3.6.10.	AT+CMMS - More Message to Send	296
3.6.11.	AT+CNMI - New Message Indications to Terminal Equipment	298
3.6.12.	AT+CNMA - New Message Acknowledgement	306
3.6.13.	AT+CMGL - List Messages	307
3.6.14.	AT+CMGR - Read Message	313
3.6.15.	AT+CMGS - Send Short Message	319
3.6.16.	AT+CMSS - Send Message from Storage	324
3.6.17.	AT+CMGW - Write Short Message to Memory	327
3.6.18.	AT+CMGD - Delete Message	333
3.6.19.	AT+CGSMS - Select Service for MO SMS Messages	335
3.6.20.	AT#E2SMSRI - SMS Ring Indicator	337
3.7.	Phonebook	339
3.7.1.	AT+CPBS - Select Phonebook Memory Storage	339
3.7.2.	AT+CPBR - Read Phonebook Entries	342
3.7.3.	AT+CPBF - Find Phonebook Entries	346
3.7.4.	AT+CPBW - Write Phonebook Entry	350
3.8.	Time & Alarm	353
3.8.1.	AT+CCLK - Clock Management	353
3.8.2.	AT+CTZR - Time Zone Reporting	355
3.8.3.	AT+CTZU - Automatic Time Zone Update	357
3.8.4.	AT#NITZ - Network Identity and Time Zone	359
3.8.5.	AT#CCLK - Clock Management	362
3.8.6.	AT#CCLKMODE - Clock Mode	365
3.9.	Audio	366
3.9.1.	Audio Basic Configuration	366
3.9.1.1.	AT+CLVL - Loudspeaker Volume Level	366
3.9.1.2.	AT+CMUT - Microphone Mute Control	368
3.9.1.3.	AT#CAP - Change Audio Path	370
3.10.	HW and Radio Control	372
3.10.1.	AT#GPIO - General Purpose Input/Output Pin Control	372
3.10.2.	AT#SLED - STAT_LED GPIO Setting	378
3.10.3.	AT#SLEDSAV - Save STAT_LED GPIO Setting	381
3.10.4.	AT#ADC - Read Analog/Digital Converter Input	382
3.10.5.	AT#V24CFG - V24 Output Pins Configuration	384
3.10.6.	AT#V24 - V24 Output Pins Control	387
3.11.	Power Down	389
3.11.1.	AT#REBOOT - Module Reboot	389

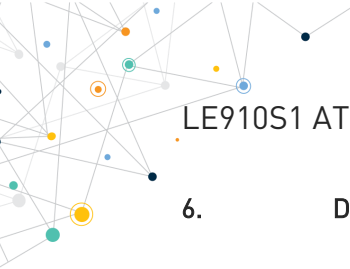


3.11.2.	AT#ENHRST - Periodic Reset	390
3.11.3.	AT#SHDN - Software Shutdown	392
3.11.4.	AT#FASTSHDN - Fast Shutdown Configuration	393
3.12.	Jamming Detection and Report	395
3.12.1.	AT#JDRENH2 - Enhanced Jamming Detection and Report	395
3.12.2.	AT#JDR4GCFG - LTE Jamming Detection Threshold Configuration	400
3.13.	Packet Domain	403
3.13.1.	AT+CGCLASS - GPRS Mobile Station Class	403
3.13.2.	AT+CGQREQ - Quality of Service Profile (Requested)	405
3.13.3.	AT+CGDCONT - Define PDP Context	408
3.13.4.	AT+CGDSCONT - Define Secondary PDP Context	412
3.13.5.	AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters	414
3.13.6.	AT+CGDATA - Enter Data State	416
3.13.7.	AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters	418
3.13.8.	AT+CGQMIN - Quality of Service Profile (Minimum Acceptable)	421
3.13.9.	AT+CGPADDR - Show PDP Address	424
3.13.10.	AT+CGCMOD - Modify PDP Context	426
3.13.11.	AT+CGTFT - Traffic Flow Template	428
3.13.12.	AT#MSCCLASS - Multislot Class Control	432
3.13.13.	AT+CGCONTRDP - PDP Context Read Dynamic Parameters	434
3.13.14.	AT+CGEQOS - Define EPS Quality of Service	438
3.13.15.	AT+CGEQOSRDP - EPS Quality of Service Read Dynamic Parameters	440
3.13.16.	AT+CGPIAF - Printing IP Address Format	442
3.13.17.	AT+CEVDP - Voice Domain Preference	445
3.13.18.	AT+CGACT - PDP Context Activate or Deactivate	447
3.13.19.	AT+CGEREP - Packet Domain Event Reporting	449
3.13.20.	AT+CGREG - GPRS Network Registration Status	454
3.13.21.	AT+CGATT - PS Attach or Detach	457
3.14.	IPEasy	459
3.14.1.	AT#SGACT - Context Activation	459
3.14.2.	AT#SGACTCFG - PDP Automatic Context Activation-Reactivation	462
3.14.3.	AT#SCFG - Socket Configuration	465
3.14.4.	AT#SCFGEXT - Socket Configuration Extended	468
3.14.5.	AT#SCFGEXT2 - Socket Configuration Extended 2	472
3.14.6.	AT#SD - Socket Dial	477
3.14.7.	AT#SO - Socket Restore	481
3.14.8.	AT#SH - Socket Shutdown	482



3.14.9.	AT#SL - Socket Listen	483
3.14.10.	AT#SLUDP - Socket Listen UDP	485
3.14.11.	AT#SA - Socket Accept	488
3.14.12.	AT#SSEND - Send Data in Command Mode	489
3.14.13.	AT#SSENDEXT - Send Data in Command Mode extended	491
3.14.14.	AT#SRECV - Socket Receive Data in Command Mode	493
3.14.15.	AT#SSENDUDP - Send UDP Data to a Specific Remote Host	496
3.14.16.	AT#SS - Socket Status	500
3.14.17.	AT#NTP - Calculate and Update Date and Time with NTP	502
3.14.18.	AT#SCFGEXT3 - Socket Configuration Extended 3	505
3.15.	FTPEasy	508
3.15.1.	AT#FTPCLOSE - FTP Close Command	508
3.15.2.	AT#FTPCWD - FTP Change Working Directory	509
3.15.3.	AT#FTPFSIZE - Get File Size from FTP Server	510
3.15.4.	AT#FTPGET - FTP Get Command	512
3.15.5.	AT#FTPGETPKT - FTP Get in Command Mode	513
3.15.6.	AT#FTPLIST - FTP List	515
3.15.7.	AT#FTPOPEN - FTP Connection Opening	516
3.15.8.	AT#FTPPUT - FTP Send File	518
3.15.9.	AT#FTPRECV - Receive Data in Command Mode	520
3.15.10.	AT#FTPREST - Set Restart Position for FTP GET	523
3.15.11.	AT#FTPTO - FTP Time Out	525
3.15.12.	AT#FTPTYPE - FTP Type	526
3.15.13.	AT#FTPFCFG - FTP Configuration	528
3.16.	HTTP	530
3.16.1.	AT#HTTPCFG - Configure HTTP Parameters	530
3.16.2.	AT#HTTPQRY - Send HTTP GET, HEAD or DELETE Request	535
3.16.3.	AT#HTTPSND - Send HTTP POST or PUT request	538
3.16.4.	AT#HTTPCV - Receive HTTP Server Data	541
3.17.	SSL	543
3.17.1.	AT#SSLCFG - Configure General Parameters of a SSL Socket	543
3.17.2.	AT#SSLSECCFG - Configure Security Parameters of a SSL Socket	547
3.17.3.	AT#SSLEN - Enable a SSL Socket	550
3.17.4.	AT#SSLD - Open a SSL Socket to a Remote Server	552
3.17.5.	AT#SSLO - Restore a SSL Socket after a +++	555
3.17.6.	AT#SSLH - Close a SSL Socket	557
3.17.7.	AT#SSLSEND - Send Data through a SSL Socket	558

3.17.8.	AT#SSLRECV - Read Data from a SSL Socket	560
3.17.9.	AT#SSLS - Report the Status of a SSL Socket	562
3.17.10.	AT#SSLI - Secure Socket Info	564
3.17.11.	AT#SSLSENDEXT - Send Data through a SSL Socket in Command Mode	566
3.17.12.	AT#SSLSECDATA - Manage the Security Data	568
3.17.13.	AT#SSLSECDATAEXT - Manage the security data extended	572
3.17.14.	AT#SSLSECCFG2 - Configure Additional Parameters of a SSL Socket	575
3.18.	FOTA & OMA	577
3.18.1.	FOTA Legacy	577
3.18.1.1.	AT#OTAUPW - OTA Delta Write	577
3.19.	GNSS	579
3.19.1.	GNSS Configuration	579
3.19.1.1.	AT\$GPSCFG - Set GNSS Configuration Parameters	579
3.19.2.	GNSS Receiver	581
3.19.2.1.	AT\$GPSP - GNSS Controller Power Management	581
3.19.3.	GNSS General Management	583
3.19.3.1.	AT\$GPSSW - GNSS Software Version	583
3.19.3.2.	AT\$GPSR - Reset the GPS Controller	584
3.19.4.	GNSS Positioning Information	586
3.19.4.1.	AT\$GPSNMUN - Unsolicited NMEA Data Configuration	586
3.19.4.2.	AT\$GPSACP - Get Acquired Position	590
3.19.4.3.	AT\$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration	594
3.20.	IMS	598
3.20.1.	AT+CIREG - IMS registration state	598
4.	PRODUCT AND SAFETY INFORMATION	601
4.1.	Copyrights and Other Notices	601
4.1.1.	Copyrights	601
4.1.2.	Computer Software Copyrights	601
4.2.	Usage and Disclosure Restrictions	602
4.2.1.	License Agreements	602
4.2.2.	Copyrighted Materials	602
4.2.3.	High Risk Materials	602
4.2.4.	Trademarks	602
4.2.5.	Third-Party Rights	603
4.2.6.	Waiver of Liability	603
4.3.	Safety Recommendations	603
5.	GLOSSARY	605





1. INTRODUCTION

1.1. Scope

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

1.2. Audience

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

1.3. Contact Information, Support

For technical support and general questions please e-mail:

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

Alternatively, use:

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

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

<https://www.telit.com>

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**). The possible values of **<err>** are reported in the table:



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



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

Numeric Format	Verbose Format
0	phone failure
1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full

Numeric Format	Verbose Format
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency calls only
34	numeric parameter instead of text parameter
35	text parameter instead of numeric parameter
36	numeric parameter out of bounds
37	text string too short
38	The GPIO Pin is already used
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
49	EAP method not supported
50	Invalid EAP parameter

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

Numeric Format	Verbose Format
273	Minimum TFT per PDP address error
274	Duplicate TFT eval prec index
275	Invalid TFT param combination
277	Invalid number of parameters
278	Invalid Parameter
320	Call index error
321	Call state error
322	Sys state error
323	Parameters error
550	generic undocumented error
551	wrong state
552	wrong mode
553	context already activated
554	stack already active
555	activation failed
556	context not opened
557	can not setup socket
558	can not resolve DN
559	time-out in opening socket
560	can not open socket
561	remote disconnected or time-out
562	connection failed
563	tx error

Numeric Format	Verbose Format
564	already listening
565	socket disconnection
566	can not resume socket
567	ip version type incompatible
568	ipv6 not enabled
569	
600	Generic undocumented error
601	wrong state
602	Can not activate
603	Can not resolve name
604	Can not allocate control socket
605	Can not connect control socket
606	Bad or no response from server
607	Not connected
608	Already connected
609	Context down
612	Resource used by other instance
613	Data socket yet opened in cmdmode
614	FTP CmdMode data socket closed
615	FTP not connected
616	FTP disconnected
617	FTP read command closed
618	FTP read command error
619	FTP write command closed

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

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

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

Table 2: ME Error Result Code

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

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

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

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

The **<err>** values are reported in the table:

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

Numeric Format	Meaning
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgement expected
500	unknown error
510	msg blocked
<err> 512 and on are manufacturer specific	
512	No SM resources
513	TR1M timeout
514	LL error

Numeric Format	Meaning
515	No response from network


Table 3: Message Service Failure Result Code


2.2.2.3. Carriage Returns, Line Feeds and Log

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

Command responses examples:

```
AT#LWM2MMON?<CR>
<CR><LF>
```

```
#LWM2MMON: "4" <LF> #LWM2MMON: "3"  missing <CR>
<CR><LF>
<CR><LF>
OK
<CR><LF>
AT#LWM2MFYACKURI=0,2<CR>
<CR><LF>
```

```
#LWM2MNFYACKURI: "/3/0/9" <LF> #LWM2MNFYACKURI: "/3/0/8"  missing <CR>
<CR><LF>
<CR><LF>
OK
<CR><LF>
```

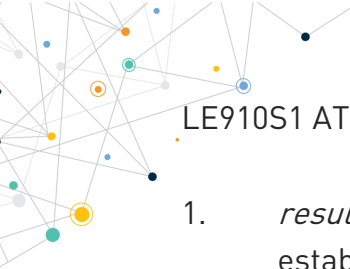
The user must be aware of this aspect before writing a script to parse the command lines and the relative response lines to generate a log.

2.2.3. Information Responses and Result Codes

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

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 4: basic result codes



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

2.2.4. Command Response Time-Out

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



number of contacts stored in the phonebook, number of stored SMS), or on the network the command may interact with.

2.2.5. Command Issuing Timing

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

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

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

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

2.3. Storage

2.3.1. Factory Profile and User Profiles

The Telit wireless modules store the values, set by several commands, in the internal non-volatile memory (NVM), allowing to remember this setting even after power off. In NVM, these values are set either as factory or user profiles. There are two customizable user profiles and one factory profile in the NVM of the device: by default, the device will start with user profile 0 equal to the factory profile.

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

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

Commands **&Y** and **&P** are both used to set the profile to be loaded at startup. **&Y** instructs the device to load at startup only the base section. **&P** instructs the device to load at startup the full profile: base + extended sections.

The **&F** command resets to factory profile values only the command of the base section of profile, while the **&F1** resets to factory profile values the full set of base + extended section commands.



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

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

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

Table 5: AT Command short overview table

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

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

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

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

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

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

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

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

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

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

Examples of the AT commands:

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



etc.

2.4. AT Command Short Overview Table

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

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

Table 6: AT Command short overview table

Here are the table fields meanings:

- SIM Presence** indicates if the AT command to be executed needs the SIM presence.
- Can be aborted** indicates if the AT command can be aborted during its execution.
- MAX timeout** indicates the time within which the command must be executed.
- SELINT** indicates on which AT interface type the AT command is available.



3. AT COMMANDS REFERENCES

3.1. Call & DTMF

3.1.1. AT+CHUP - Hang Up Call

This command cancels all active and held calls



3GPP TS 27.007

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



AT+CHUP

Execution command cancels all active and held calls, also if a multi-party session is running



AT+CHUP=?

Test command returns the **OK** result code

3.1.2. AT+CRLP - Radio Link Protocol

Set Radio Link Protocol (RLP) parameters.



3GPP TS 27.007

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


AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>[,<ver>,<T4>]]]]]

Set command sets Radio Link Protocol (RLP) parameters used when non-transparent data calls originated.

Parameters:

Name	Type	Default	Description
<iws>	integer	61	IWF window dimension
Value:			
1÷61 : dimension - factory default value is 61 (ver 0 or 1)			
<mws>	integer	61	MS window dimension
Value:			
1÷61 : dimension - factory default value is 61 (ver 0 or 1)			
<T1>	integer	128	acknowledge timer in 10 milliseconds units
Value:			
39÷255 : 10 milliseconds units - default value is 128 (ver 0 or 1)			
<N2>	integer	255	retransmission attempts
Value:			



		1÷255	:	number of attempts
<ver>	integer	N/A		protocol version
	Value:			
		0,1	:	version
<T4>	integer	3		re-sequencing period
	Value:			
		3÷255	:	re-sequencing period



AT+CRLP?

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

+CRLP: **<iws>**,**<mws>**,**<T1>**,**<N2>**,**<ver>**,**<T4>**
OK



AT+CRLP=?

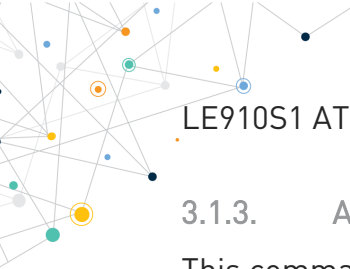
Test command returns the range of setting value for each supported RLP version **<ver>**.



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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.1.3. AT+CRC - Cellular Result Codes

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



3GPP TS 27.007

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



AT+CRC=[<mode>]

Set command controls whether or not the extended format of incoming call indication is used.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	disables/enables extended format reporting. When enabled, an incoming call is indicated to the TE with unsolicited result code

+CRING: <type>

instead of the normal **RING**

Values:

0 : disables extended format reporting (factory default)

1 : enables extended format reporting

Unsolicited field:

Name	Type	Description
<type>	string	call type

Values:



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



AT+CRC?

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

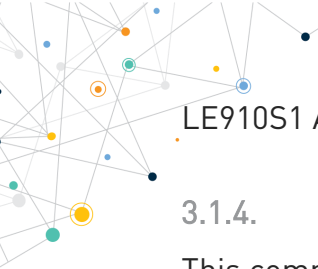


AT+CRC=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.1.4. AT+CVHU - Voice Hung Up Control

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

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

AT+CVHU=[<mode>]

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

Parameter:

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

Values:

- 0 : "Drop DTR" ignored but OK result code given. ATH disconnects.
- 1 : "Drop DTR" and ATH ignored but OK result code given.
- 2 : "Drop DTR" behavior according to &D setting. ATH disconnects.

AT+CVHU?

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

+CVHU: <mode>

AT+CVHU=?

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

3.1.5. AT+CSTA - Select Type of Address

Select type of address.



- 3GPP TS 24.008
- 3GPP TS 27.007

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



AT+CSTA=[<type>]

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

Parameter:

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

Values:

- 129 : National address type.
- 145 : International number. Dialing string includes international access code character "+".



AT+CSTA?

Read command returns the current value of <type> parameter



AT+CSTA=?

Test command returns supported **<type>** parameter values.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.1.6. AT+FCLASS - Select Active Service Class

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



3GPP TS 27.007

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



AT+FCLASS=<n>

Parameter:

Name	Type	Default	Description
<n>	integer	0	type of call

Values:

0 : data type

8 : voice type



AT+FCLASS?

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

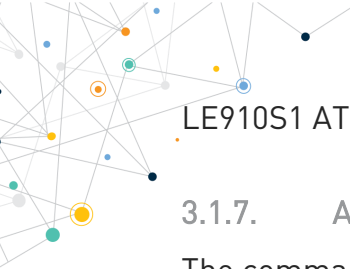


AT+FCLASS=?

Test command returns all supported values of the parameters <n>.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.1.7. AT+VTS - DTMF Tones Transmission

The command handles the transmission of DTMF tones.



3GPP TS 27.007
TIA IS-101

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



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

Execution command allows the transmission of DTMF tones.

Parameters:

Name	Type	Default	Description
<dtmfString>	string	-	string of <dtmf>s, i.e. ASCII characters in the set (0 9), #, *, (A-D), P; the string can be at most 255 <dtmf>s long; it allows the user to send a sequence of DTMF tones, each of them with a duration that was defined through +VTD command
<duration>	integer	N/A	duration of a tone in 1/100 sec; this parameter can be specified only if the length of first parameter is just one ASCII character

Values:

- 0 : a single DTMF tone will be transmitted for a duration depending on the network, no matter what the current AT+VTD setting is



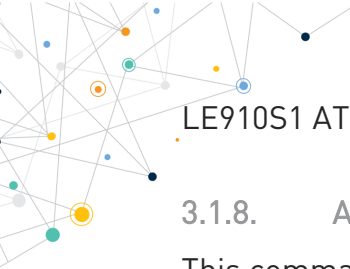
10÷1000 : a single DTMF tone will be transmitted for a time <duration> (in 10 ms multiples), no matter what the current AT+VTD setting is

- i** The character P does not correspond to any DTMF tone, but it is interpreted as a pause of 3 seconds between the preceding and succeeding DTMF string elements.
 - i** This command operates in voice mode only (see +FCLASS).
-

? AT+VTS=?

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

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



3.1.8. AT+VTD - Tone Duration

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



3GPP TS 27.007
TIA IS-101

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



AT+VTD=<duration>

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

Parameter:

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

Values:

- 0 : the duration of every single tone is dependent on the network
- 1÷1000 : duration of every single tone in 1/10 sec



AT+VTD?

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

<duration>

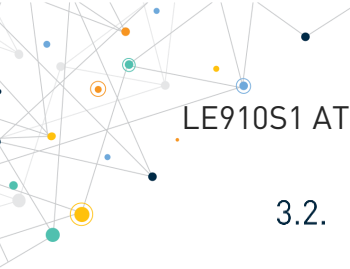


AT+VTD=?

Test command provides the list of supported <duration>



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.2. General Control and Config

3.2.1. Command Line Prefixes

3.2.1.1. AT - Starting a Command Line

AT is the prefix used to start a command line.



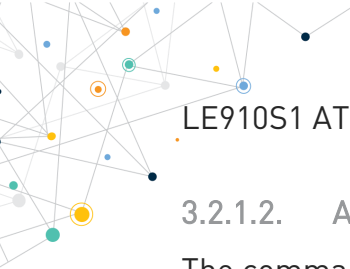
ITU-T Recommendation V.25 ter
3GPP TS 27.007

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



AT

The prefix **AT** is a two-character abbreviation ("ATtention"), always used to start a command line to be sent from TE to TA, with the only exception of AT#/ prefix. As a command, it can be issued just to test if the device is responding to AT commands.



3.2.1.2. A/ - Last Command Automatic Repetition

The command immediately executes the previously issued command or commands.



ITU-T Recommendation V.25 ter



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

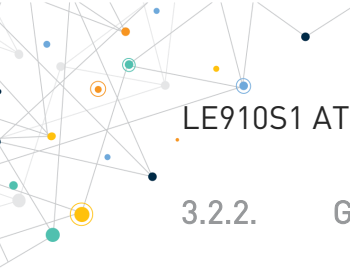


A/

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

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

-  This command works only at fixed IPR.
-  The custom prefix **AT#/** has been defined: it causes the last command to be executed again too; but it does not need a fixed **+IPR**.



3.2.2. Generic Modem Control

3.2.2.1. 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

Values:

- 0 : only the factory profile base section parameters are considered
- 1 : either the factory profile base section and the extended section are considered (full factory profile)



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



3.2.2.2. 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[<n>]

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

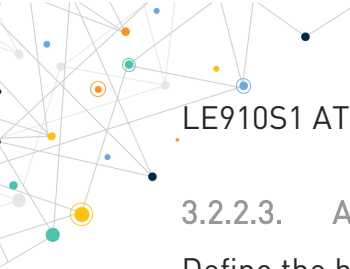
Parameter:

Name	Type	Default	Description
<n>	integer	N/A	user profile number

Value:

0,1 : user profile number

- i** If parameter <n> is omitted, the command has the same behavior as ATZ0
- i** Any active call is terminated.



3.2.2.3. AT&Y - Default Reset Basic Profile Designation

Define the basic profile that is loaded on startup.

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

AT&Y=[<n>]

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

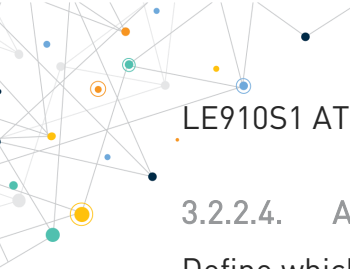
Parameter:

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

Value:

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

- Differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&Y** will be loaded on every startup.
- If parameter is omitted the command has the same behavior as **AT&Y0**.



3.2.2.4. AT&P - Default Reset Full Profile Designation

Define which full profile is loaded at startup.

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



AT&P[<n>]

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

Parameter:

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

Value:

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

- i** Differently from command **Z<n>**, which loads just once the desired profile, the one chosen through command **&P** will be loaded at every startup.
- i** If parameter is omitted, the command has the same behavior as **AT&P0**



3.2.2.5. AT&W - Store Current Configuration

Stores the complete configuration of the device.

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



AT&W[<n>]

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

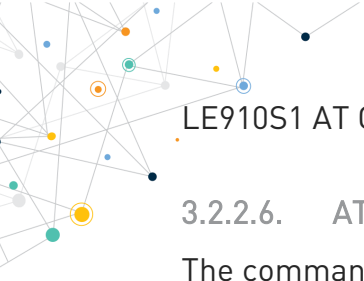
Parameter:

Name	Type	Default	Description
<n>	integer	0	profile identifier

Value:

0,1 : profile identifiers

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



3.2.2.6. AT&V - Display some Configuration and Profile

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

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

AT&V

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

setting/parameter : value

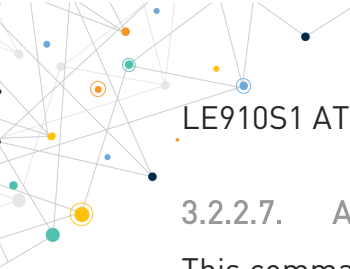


Example of returned values.

- AT&V
 - DTE SPEED : 115200
 - COMMAND ECHO : E0=NO
 - RESULT MESSAGES : Q0=YES
 - VERBOSE MESSAGES : V1=YES
 - EXTENDED MESSAGES : X0=NO
 - FLOW CONTROL OPTIONS : &K3=HW bidirect.
 - DTR (C108) OPTIONS : &D0=ignored
 - DCD (C109) OPTIONS : &C1=follows carrier
 - POWER SAVING ON DTR : +CFUN:1=NO
 - POWER SAVING ON DTR : +CFUN:1=NO
 - DEFAULT PROFILE : &Y0=user profile 1
- OK

where the first POWER SAVING ON DTR line is for SIM1 slot and the second POWER SAVING ON DTR line is for SIM2 slot (see **+CFUN** note about Dual SIM Dual Standby configuration).





3.2.2.7. AT+GCAP - Capabilities List

This command returns the equipment supported command set list.



ITU-T Recommendation V.25 ter

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

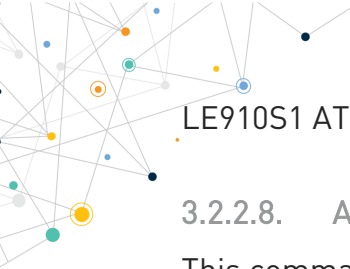


AT+GCAP

Execution command returns the equipment supported command set list:

Additional info:

- ▶▶ Supported Command Set:
 - +CGSM: 3GPP TS command set
 - +DS: Data Service common modem command set
 - +ES: WCDMA data Service common modem command set
 - +MS: Mobile Specific command set



3.2.2.8. 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



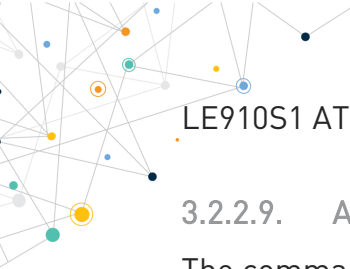
AT+GMI

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



AT+GMI=?

Test command returns **OK** result code.



3.2.2.9. 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



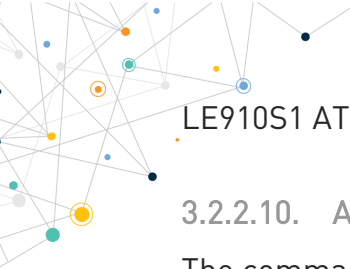
AT+GMM

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



AT+GMM=?

Test command returns **OK** result code.



3.2.2.10. 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.



3.2.2.11. 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[=<snt>]

Set command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE is connected to.

Parameter:

Name	Type	Default	Description
<snt>	integer	N/A	indicates the serial number type that has been requested

Values:

- 0 : returns <sn>
- 1 : returns <imei> (International Mobile station Equipment Identity)
- 2 : returns the <imeisv> (International Mobile station Equipment Identity and Software Version number)
- 3 : returns the <svn> (Software Version Number)

Additional info:

- ▶▶ Here below return parameters description

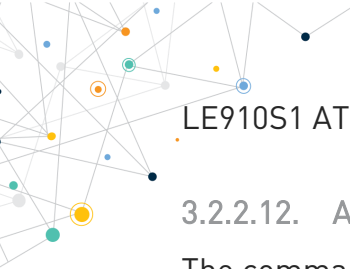
Name	Type	Default	Description
------	------	---------	-------------

<sn>	string	-	Indicates the product "serial number", identified as the IMEI of the mobile, without command echo.
<imei>	string	-	string type in decimal format indicating the IMEI. IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS .
<imeisv>	string	-	string type in decimal format indicating the IMEISV. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits). Character set used in <imeisv> is as specified by command Select TE Character Set +CSCS .
<svn>	string	-	string type in decimal format indicating the current SVN which is a part of IMEISV. Character set used in <svn> is as specified by command Select TE Character Set +CSCS .

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

? AT+GSN=?

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



3.2.2.12. 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



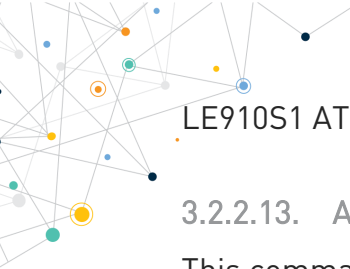
AT+CGMI

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



AT+CGMI=?

Test command returns **OK** result code.



3.2.2.13. 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



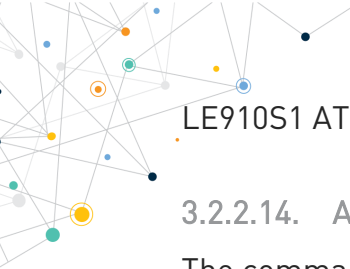
AT+CGMM

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



AT+CGMM=?

Test command returns **OK** result code.



3.2.2.14. 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.



3.2.2.15. AT+CGSN - Request Product Serial Number Identification

This command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE is connected to



3GPP TS 27.007

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



AT+CGSN=[<snt>]

Execution command **AT+CGSN** returns the product "serial number", identified as the IMEI of the mobile, without command echo.

Parameter:

Name	Type	Default	Description
<snt>	integer	N/A	the serial number type that has been requested

Values:

- 0 : returns <sn>
- 1 : returns the IMEI (International Mobile station Equipment Identity) <imei>
- 2 : returns the IMEISV (International Mobile station Equipment Identity and Software Version number) <imeisv>
- 3 : returns the SVN (Software Version Number) <svn>

Additional info:

- ▶▶ The IMEI (15 digits) 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

The IMEISV (16 digits) 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. Software version (SVN). Its length is 2 digits

Name	Type	Default	Description
<sn>	string	-	Indicate the product "serial number", identified as the IMEI of the mobile, without command echo
<imei>	string	-	IMEI in decimal format
<imeisv>	string	-	IMEISV in decimal format
<svn>	string	-	the current SVN (which is a part of IMEISV) in decimal format

- i** Character set used in <imei>, <imeisv> and <svn> is as specified by command Select TE Character Set **+CSCS**.

? AT+CGSN=?

Test command returns supported <snt> values.



3.2.2.16. AT#CGSN - Product Serial Number Identification

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

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



AT#CGSN=[<snt>]

Set command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE connected to.

Parameter:

Name	Type	Default	Description
<snt>	integer	N/A	serial number type that has been requested

Values:

- 0 : returns <sn>
- 1 : returns the IMEI (International Mobile station Equipment Identity)
- 2 : returns the IMEISV (International Mobile station Equipment Identity and Software Version number)
- 3 : returns the SVN (Software Version Number)

Additional info:

- ▶▶ <sn> Indicates the product "serial number", identified as the IMEI of the mobile, with command echo.

<imei> string type in decimal format indicating the IMEI. IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used

in **<imei>** is as specified by command Select TE Character Set **+CSCS**.

<imeisv> string type in decimal format indicating the IMEISV. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the software version (SVN) (2 digits). Character set used in **<imeisv>** is as specified by command Select TE Character Set **+CSCS**.

<svn> string type in decimal format indicating the current SVN which is a part of IMEISV. Character set used in **<svn>** is as specified by command Select TE Character Set **+CSCS**.



AT#CGSN=?

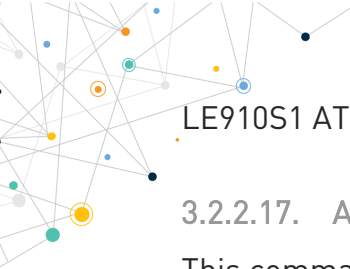
Test command returns supported **<snt>** values.



AT#CGSN

#CGSN: 358677008900540

OK



3.2.2.17. 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.



3.2.2.18. AT+CPAS - Phone Activity Status

The command reports the device status in a numeric format.



3GPP TS 27.007

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



AT+CPAS

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

Additional info:

- ▶ Message format returned by the execution command:

+CPAS: <pas>

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

Values:


- 0 : ready (MT allows commands from TA/TE)
- 1 : unavailable (MT does not allow commands from TA/TE)
- 2 : unknown (MT is not guaranteed to respond to instructions)
- 3 : ringing (MT is ready for commands from TA/TE, but the ringer is active)



- 4 : call in progress (MT is ready for commands from TA/TE, but a call is in progress)
 - 5 : asleep (MT is unable to process commands from TA/TE because it is in a low functionality state)
 - 6 : call in active
-

 **AT+CPAS=?**

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

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

</> **ATD03282131321;**
OK

AT+CPAS
+CPAS: 4 The called phone has answered to your call
OK

ATH
OK



3.2.2.19. 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 (Not supported)
- 1 : mobile full functionality with power saving disabled.
- 2 : disable TX (Not supported)
- 4 : disable both TX and RX
- 5 : mobile full functionality with power saving enabled (Not supported)
- 6 : mobile reboot (Not supported)
- 7 : Offline mode, see Additional info section (Not supported)
- 8 : FTM, see Additional info section (Not supported)
- 12 : RS232 power saving, see Additional info section

<rst>	integer	0	Reset flag.
--------------------	---------	---	-------------

Values:

- 0 : do not reset the ME before setting it to <fun> functionality level.
 - 1 : reset the device. The device is fully functional after the reset. This value is available only for <fun> = 1.
-

Additional info:

- ▶▶ **<fun>=1**
the mobile is in full functionality with power saving disabled

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

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

- ▶▶ **<fun>=4**
disable both TX and RX. Issuing

AT+CFUN=4[,0]

actually causes the module to perform either a network deregistration and a SIM deactivation

▶▶ **<fun>=7**

Offline mode. Not supported.

<fun>=8

FTM. Not supported.

These are special modes, you can only see them only through the read command and you cannot set them

▶▶ **<fun>=12**

If only UART connected and USB disconnected:

- the mobile full functionality with power saving disabled will be active for 60 seconds after last AT command
- 60 seconds after last AT command the mobile will enter power saving and first AT command on UART will be lost

- i** If power saving mechanism enabled, it reduces the power consumption during the idle time, thus allowing a longer standby time with a given battery capacity.
- i** In a Dual SIM Dual Standby configuration **AT+CFUN** setting is applied to the master SIM (see **+SWITCHSIM**).
Master SIM and slave SIM can have different **AT+CFUN** settings



AT+CFUN?


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

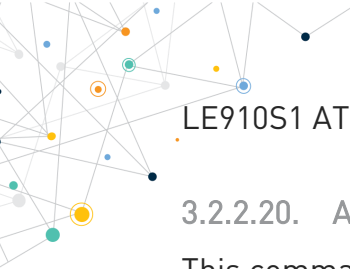


 **AT+CFUN=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.2.2.20. AT+CIND - Indicator Control

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



3GPP TS 27.007

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



AT+CIND=[<state>[,<state>,...]]

Set command is used to control the registration state of ME indicators, in order to automatically send the +CIEV URC, whenever the value of the associated indicator changes. The supported indicators (<descr>) and their order appear from test command AT+CIND=?

Parameter:

Name	Type	Default	Description
<state>	integer	0	registration state

Values:

- 0 : the indicator is deregistered; there is no unsolicited result code (+CIEV URC) automatically sent by the modem to the application, whenever the value of the associated indicator changes; the value can be directly queried with +CIND?
- 1 : the indicator is registered: an unsolicited result code (+CIEV URC) is automatically sent by the modem to the application, whenever the value of the associated indicator changes; it is still possible to query the value through AT+CIND?



AT+CIND?

Read command returns the current value of ME indicators, in the format:
+CIND: <ind>,<ind>,...<ind>

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

? AT+CIND=?

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

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

Additional info:

- ▶▶ Test command response parameters

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

Values:

"battchg"	:	dummy, it can be set but it does not have any effect; battery charge level; indicator <ind> in the range 0...5(bar levels), or 99 (not measurable)
"signal"	:	signal quality; indicator <ind> in the range 0...7(bar levels), or 99 (not measurable); same as bit error rate (<ber>) in +CSQ command

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



"callsetup"	: call setup status indicator; indicator <ind> values are 0 (no active call setup), 1 (MT call is ringing), 2 (MO call was initiated), 3 (MO call ringing at called party)
-------------	--



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



Next command causes all the indicators to be registered

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

Next command causes all the indicators to be de-registered

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

Next command to query the current value of all indicators

AT+CIND?

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

OK



3.2.2.21. AT+CACM - Accumulated Call Meter

The command purpose is to reset the Advice of Charge accordingly to the Accumulated Call Meter stored in SIM (ACM): it contains the total number of home units for both the current and preceding calls.



3GPP TS 27.007

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



AT+CACM=[<pwd>]

The set command resets the Advice of Charge accordingly to the Accumulated Call Meter stored in SIM (ACM): it contains the total number of home units for both the current and preceding calls.

Parameter:

Name	Type	Default	Description
<pwd>	string	-	to access this command PIN2 is required, if after the startup the PIN2 has already been input, it is no longer required to issue the command.



AT+CACM?


Read command reports the current value of the SIM ACM in the format:

+CACM: <acm>

Additional info:

- ▶▶ Read command response parameter

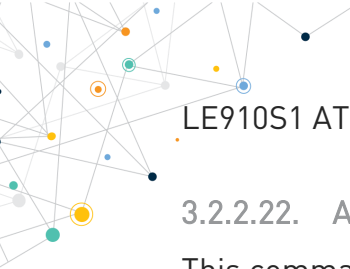
Name	Type	Default	Description
<acm>	string	-	accumulated call meter in home units: three bytes of the ACM value in hexadecimal format (e.g. "00001E" indicates decimal value 30).

-  The value <acm> is in home units; price per unit and currency are defined with command **+CPUC**



AT+CACM=?

Test command returns the **OK** result code



3.2.2.22. AT+CAMM - Accumulated Call Meter Maximum

This command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax).



3GPP TS 27.007

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



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

Set command sets the Advice of Charge related Accumulated Call Meter Maximum Value stored in SIM (ACMmax). This value represents the maximum number of home units allowed to be consume by the subscriber. When ACM reaches <acmmax> value, further calls are prohibited.

Parameters:

Name	Type	Default	Description
<acmmax>	string	-	ACMmax value, integer type: it is the maximum number of home units allowed to be consumed by the subscriber.
<pwd>	string	-	PIN2; notice that if PIN2 has been already input once after startup, it is no more required



Setting <acmmax> to 0 disables the feature



AT+CAMM?

Read command reports the ACMmax value stored in SIM in the format:

+CAMM : <acmm>



Additional info:

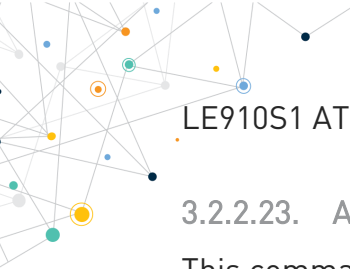
- ▶▶ Read command response parameter

Name	Type	Default	Description
<acmm>	string	-	accumulated call meter in home units: three bytes of the ACMmax value in hexadecimal format (e.g. "00001E" indicates decimal value 30)



AT+CAMM=?

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



3.2.2.23. AT+CCWE - Call Meter Maximum Event

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



3GPP TS 27.007

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



AT+CCWE=<mode>

Set command is used to enable/disable sending of an unsolicited result code +CCWV shortly before the ACM (Accumulated Call Meter) maximum value is reached. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 seconds call time remains.

Parameter:

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

<mode>	integer	0	enable mode
--------	---------	---	-------------

Values:

0 : Disable the call meter warning event

1 : Enable the call meter warning event




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



AT+CCWE?


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



 **AT+CCWE=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.2.2.24. 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:

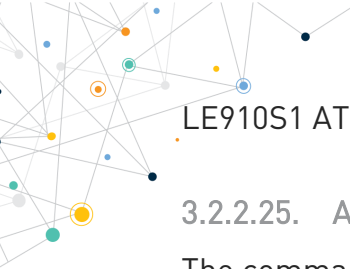
`<ATcmd1>[<CR><LF><ATcmd2>[...]]`

`<ATcmdn>` is the AT command.



AT+CLAC=?

Test command returns the OK result code.



3.2.2.25. 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 enables/disables the report of result code:

+CME ERROR: <err>

as an indication of an error relating to the **+Cxxx** commands issued. When enabled, device related errors cause the **+CME ERROR <err>** result code instead of the default **ERROR** result code. **ERROR** anyway returned normally when the error message related to syntax, invalid parameters, or DTE functionality.

Parameter:



Name	Type	Default	Description
<n>	integer	0	enable flag

Values:

- 0 : disable +CME ERROR:<err> reports, use only ERROR report
- 1 : enable +CME ERROR:<err> reports, with <err> in numeric format
- 2 : enable +CME ERROR: <err> reports, with <err> in verbose format



default value after powerup is "0"

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



AT+CMEE?

Read command returns the current value of subparameter **<n>**:


+CMEE: <n>



AT+CMEE=?

Test command returns the range of values for subparameter **<n>**



-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

3.2.2.26. AT+CEER - Extended Error Report

Reports extended error related to the last unsuccessful call.



- 3GPP TS 27.007
- GSM 04.08

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



AT+CEER

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

+CEER: <report>

+CEER: <report>

This report regards some error condition that may occur:
 the failure in the last unsuccessful call setup (originating or answering)
 the last call release
 the last unsuccessful GPRS attach or unsuccessful PDP context activation,
 the last GPRS detach or PDP context deactivation.

- i** the first line for the voice and the second line for data
- i** if none of these conditions have occurred since power up then **"Normal, unspecified"** condition is reported



AT+CEER=?

Test command returns **OK** result code.



3.2.2.27. 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	N/A	character set to be used by the device.

Values:

IRA : International Reference Alphabet (ITU-T T.50).
Quoted string; e.g. "AB" equals two 8-bit characters with decimal values 65, 66

UCS2 : 16-bit universal multiple-octet coded character set (ISO/IEC10646).

GSM : GSM default alphabet (3GPP TS 23.038).



AT+CSCS?

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



AT+CSCS=?



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



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



```
AT+CSCS=?  
+CSCS: ("IRA","UCS2","GSM")  
OK
```

```
AT+CSCS?  
+CSCS: "IRA"  
OK
```

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

```
AT+CSCS="UCS2"  
OK
```

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

```
AT+CSCS="IRA"  
OK
```

```
AT+CPBR=1  
+CPBR: 1,"8475763000",129,"Lin Zhao"  
OK
```

3.2.2.28. 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	multiplexer transparency mechanism.
	Value:		
		0	: basic option mode; it is currently the only supported value
<subset>	integer	0	the way in which the multiplexer control channel is set up
	Value:		
		0	: UIH frames used only; it is currently the only supported value
<port_speed>	integer	5	transmission rate
	Value:		
		5	: 115200 bps; it is currently the only supported value

<N1>	integer	N/A	Maximum frame size.
	Value:		
	1÷1509	:	expressed in bytes
<T1>	integer	N/A	Acknowledgement timer in units of ten milliseconds
	Value:		
	1÷255	:	in units of ten milliseconds
<N2>	integer	N/A	Maximum number of re-transmissions
	Value:		
	1÷100	:	range of re-transmissions number
<T2>	integer	N/A	Response timer for the multiplexer control channel. T2 must be longer than T1.
	Value:		
	2÷255	:	in units of ten milliseconds
<T3>	integer	N/A	Wake up response timer
	Value:		
	1÷255	:	in seconds
<K>	integer	N/A	Window size, for Advanced option with Error-Recovery Mode
	Value:		
	1÷7	:	window size range

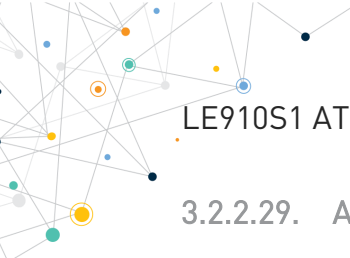
AT+CMUX?

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.



3.2.2.29. AT#CMUXMODE - CMUX Mode Set

The module is equipped with the CMUX standard protocol to provide multiplexing features. The #CMUXMODE command configures the CMUX behavior concerning the DTR control line.



3GPP TS 27.010

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



AT#CMUXMODE=<mode>




Set command sets the CMUX mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	0	multiplexer transparency mechanism.

Values:

- 0 : Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode
- 1 : Ignore DTR feature is disabled, a transmission of the physical DTR line instructs the DCE to disable the CMUX and switches to the normal command mode
- 4 : Ignore DTR feature is enabled, the DCE doesn't care the physical DTR line transitions
- 5 : Ignore DTR feature is enabled, the DCE doesn't care the physical DTR line transitions

-  DLC establishment on Virtual Channel between mode 0 and mode 1 is different.
-  A software or hardware reset restores the default value
-  During CMUX session the set command will return **ERROR**, only the read and test command can be used.



AT#CMUXMODE?

Read command reports the current parameters values in the format:

#CMUXMODE: <mode>



AT#CMUXMODE=?

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



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

Set the values of Price per Unit and Currency Table.



3GPP TS 27.007

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



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

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

Parameters:

Name	Type	Default	Description
<currency>	string	-	three characters currency code (e.g. "LIT", "L. ", "USD", "DEM" etc..); used character set should be the one selected with command +CSCS
<ppu>	string	-	price per unit (dot is used as decimal separator) e.g. "1989.27"
<pwd>	string	-	SIM PIN2; if PIN2 has been already input once after startup, it is required no more



AT+CPUC?

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

+CPUC : <currency>,<ppu>



 **AT+CPUC=?**

Test command returns **OK** result code.



3.2.2.31. AT#PDPAUTH - PDP Authentication Parameters

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

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



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

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

Parameters:

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



AT#PDPAUTH?



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

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

...

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



AT#PDPAUTH=?

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



3.2.2.32. AT#TXCALD - Change TX Power Level for a Supported Band

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


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


AT#TXCALD=<band>,<deltaTxPwrLev>

Set command change the TX power level for the specified band.

Parameters:

Name	Type	Default	Description
<band>	integer	N/A	numeric parameter indicating the band whose TX power level must be changed
Values:			
	0	: GSM 850	
	1	: GSM 900	
	2	: DCS 1800	
	3	: PCS 1900	
<deltaTxPwrLev>	integer	-	reduction (if negative) or raise (if positive) of the TX power level for the band specified, in 1/16 dBm. Every 16 units represent a dBm (e.g. 16 is equal to 1 dBm, -32 is equal to -2 dBm, 0 no reduction/raise).

 AT#TXCALD parameters are saved in NVM and applied at power on.

 After command set, a reboot of the modem is required.



AT#TXCALD?

Read command returns the bands supported and the reduction/rise of the TX power level set for each band in the format:

#TXCALD: 0,<deltaTxPwrLev>

#TXCALD: 1,<deltaTxPwrLev>

#TXCALD: 2,<deltaTxPwrLev>

#TXCALD: 3,<deltaTxPwrLev>



AT#TXCALD=?

Test command reports the supported range of parameters values.



3.2.2.33. AT#TXCAL4GD - Change Max TX Power Level for a Supported Band

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

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

AT#TXCAL4GD=<band>,<deltaTxPwrLev>

Setcommand changes the maximum TX power level for the specified band.

Parameters:

Name	Type	Default	Description
<band>	integer	-	number of the LTE band whose TX maximum power level must be changed. To know its range, use Test command.
<deltaTxPwrLev>	integer	0	reduction (if negative) or raise (if positive) of the maximum TX power level for the band specified, in 1/10 dBm. Every 10 units represent a dBm (e.g. 10 is equal to 1 dBm, -20 is equal to -2 dBm, 0 no reduction/raise).

Value:

0 : no reduction/raise

- AT#TXCAL4GD parameters are saved in NVM and applied at power on.
- After command set, a reboot of the modem is required.

**AT#TXCAL4GD?**

Read command returns the bands supported and the reduction/rise of the TX maximum power level set for each band in the format:

#TXCAL4GD: <band>,<deltaTxPwrLev>

#TXCAL4GD: <band>,<deltaTxPwrLev>

#TXCAL4GD: <band>,<deltaTxPwrLev>

#TXCAL4GD: <band>,<deltaTxPwrLev>

#TXCAL4GD: <band>,<deltaTxPwrLev>

...

**AT#TXCAL4GD=?**

Test command reports the supported range of parameters values.



3.2.3. S Parameters

3.2.3.1. ATSO - Number of Rings to Auto Answer

The command controls the automatic answering feature of the DCE.



ITU-T Recommendation V.25 ter

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



ATSO=[<n>]

Set command sets the number of rings required before device automatically answers an incoming call.

Parameter:

Name	Type	Default	Description
<n>	integer	0	Number of rings

Values:

0 : auto answer disabled

1÷255 : number of rings required before automatic answer.



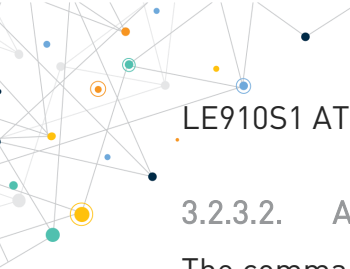
ATSO?

Read command returns the current value of S0 parameter.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"





3.2.3.2. 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 used as escape character.

Parameter:

Name	Type	Default	Description
<char>	integer	43	escape character decimal ASCII


Value:

43 : factory default value is '+'


-  The escape sequence consists of three escape characters preceded and followed by **n** ms of idle (see **S12** to set **n**).

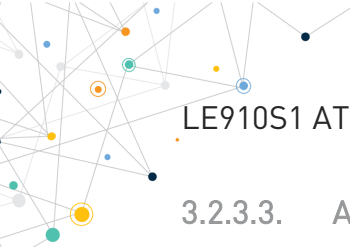
ATS2?

Read command returns the current value of **S2** parameter.

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.2.3.3. AT3 - Command Line Termination Character

The command manages the character configured as command line terminator.



ITU-T Recommendation V.25 ter
3GPP TS 27.007

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



AT3=[<char>]

Set command sets the value of the character either recognized by the device as command line terminator and generated by the device as part of the header, trailer, and terminator for result codes and information text, along with **S4** parameter.

Parameter:

Name	Type	Default	Description
<char>	integer	13	command line termination character (decimal ASCII)

Value:

0÷127 : command line termination character


- i** The "previous" value of **S3** is used to determine the command line termination character for entering the command line containing the **S3** setting command. However, the result code issued shall use the "new" value of **S3** (as set during the processing of the command line)




AT3?

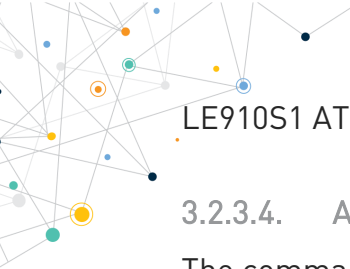
Read command returns the current value of **S3** parameter.



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



-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.2.3.4. ATS4 - Response Formatting Character

The command manages the character generated by the device as part of the header, trailer, and terminator for result codes and information text.



ITU-T Recommendation V.25 ter
3GPP TS 27.007

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



ATS4=[<char>]

Set command sets the value of the character generated by the device as part of the header, trailer, and terminator for result codes and information text, along with the **S3** parameter.

Parameter:

Name	Type	Default	Description
<char>	integer	10	response formatting character (decimal ASCII)

Value:

0÷127 : response formatting character




If the value of **S4** is changed in a command line the result code issued in response of that command line will use the new value of **S4**.




ATS4?

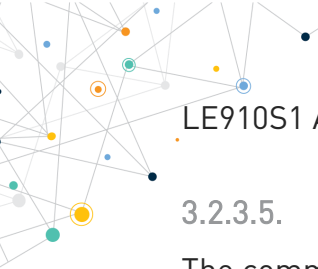
Read command returns the current value of **S4** parameter.



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



-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.2.3.5. ATS5 - Command Line Editing Character

The command manages the value of the character recognized by the DCE as a request to delete from the command line the immediately preceding character.



ITU-T Recommendation V.25 ter
3GPP TS 27.007

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



ATS5=[<char>]

Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character.

Parameter:

Name	Type	Default	Description
<char>	integer	8	command line editing character (decimal ASCII)

Value:

0÷127 : command line editing character



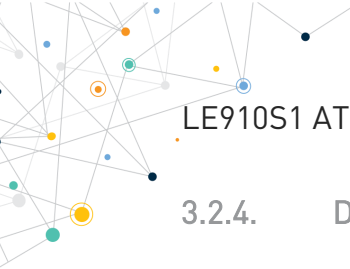
ATS5?

Read command returns the current value of **S5** parameter.

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.2.4. DTE - Modem Interface Control

3.2.4.1. ATE - Command Echo

This command allows to enable or disable the command echo.



ITU-T Recommendation V.25 ter

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



ATE[<n>]

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

Parameter:

Name	Type	Default	Description
<n>	integer	1	Configuration value

Values:

0 : disables command echo

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



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



ATE?

Read command returns the current value of n.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.2.4.2. ATQ - Quiet Result Codes

This command allows to enable or disable the result code.



ITU-T Recommendation V.25 ter

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



ATQ[<n>]

Set command enables or disables the result codes.

Parameter:

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

Values:

- 0 : enables result codes
- 1 : disables result codes.
- 2 : disables result codes (only for backward compatibility).

- After issuing either **ATQ1** or **ATQ2** every information text transmitted in response to commands is not affected
- If parameter is omitted, the command has the same behavior of **ATQ0**.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

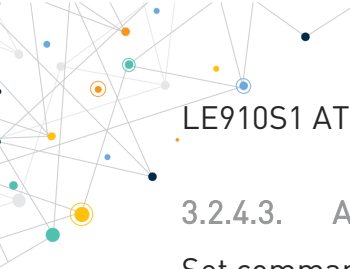


After issuing ATQ1 or ATQ2

AT+CGACT=?

+CGACT: (0-1)

nothing is appended to the response



3.2.4.3. 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**



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

3.2.4.4. ATI - Identification Information

This command returns identification information.



ITU-T Recommendation V.25 ter

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



ATI[<n>]

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

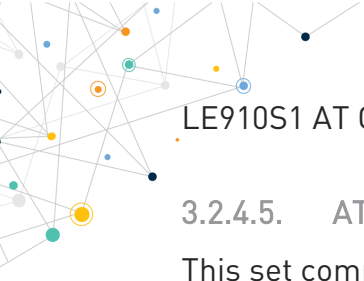
Parameter:

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 **ATI0**



3.2.4.5. 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>]

Set command controls the DCD output behavior of the serial port.

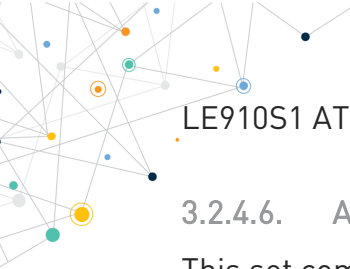
Parameter:

Name	Type	Default	Description
<n>	integer	1	DCD output behavior

Values:

- 0 : DCD remains always High
- 1 : DCD follows the Carrier detect status: if carrier is detected DCD goes High, otherwise DCD is Low
- 2 : DCD is always High except for 1 sec "wink" when a data call is disconnected

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



3.2.4.6. AT&D - Data Terminal Ready (DTR) Control

This set command configures the behavior of the module according to the DTR control line transitions (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:

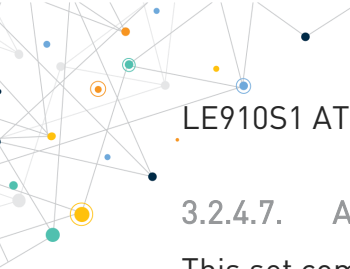
- 0 : module ignores DTR control line transitions
- 1 : when the module is connected, the high to low transition of DTR line sets the module in command mode, the current connection is not closed
- 2 : when the module is connected, the high to low transition of DTR line sets the module in command mode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

- i** If **AT&D2** has been issued, and the DTR line has been tied Low, auto-answering is inhibited and it is possible to answer only issuing command **ATA**.
- i** If parameter is omitted, the command has the same behavior of **AT&D0**.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"





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

This set command specifies the DTE speed at which the device accepts commands during command mode operations; it may be used to fix the **DTE-DCE** interface speed.



ITU-T Recommendation V25 ter

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



AT+IPR=<rate>

Parameter:

Name	Type	Default	Description
<rate>	integer	115200	speed of the serial port expressed in bit per second.

Values:

- 300 : bps
- 1200 : bps
- 4800 : bps
- 9600 : bps
- 14400 : bps
- 19200 : bps
- 28800 : bps
- 38400 : bps
- 56000 : bps
- 57600 : bps



115200 : bps

128000 : bps

230400 : bps

460800 : bps

921600 : bps

-
- i** DTE speed of USB does not change
 - i** If <rate> is specified **DTE-DCE** speed fixed to that speed, hence no speed auto-detection (autobauding) is enabled.

AT+IPR?

Read command returns the current value of +IPR parameter.

AT+IPR?

+IPR: 115200

OK

AT+IPR=?

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

+IPR:(list of supported auto detectable <rate> values)

AT+IPR=?

+IPR:

(300,1200,4800,9600,14400,19200,28800,38400,56000,57600,115200,128000,230400,
,460800,921600)

OK



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

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

This set command selects the flow control of the serial port in both directions, from DTE to modem and from modem to DTE.



ITU-T Recommendation V25 ter

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



AT+IFC=<by_te>,<by_ta>

Parameters:

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

<by_te>	integer	2	flow control option for the data received by DTE
---------	---------	---	--

Values:

0 : flow control None

2 : C105 (RTS)

<by_ta>	integer	2	flow control option for the data sent by modem
---------	---------	---	--

Values:


0 : flow control None

2 : C106 cfo (CTS)

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

i Hardware flow control (**AT+IFC=2,2**) is not active in command mode.

To activate this setting in command mode, use **AT#CLFO=1** (currently not supported).

-  This command is equivalent to **&K** command.



AT+IFC?

Read command returns active flow control settings.

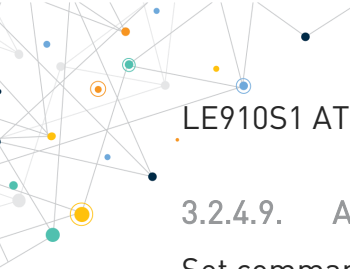


AT+IFC=?

Test command returns all supported values of the parameters **<by_te>** and **<by_ta>**.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.2.4.9. ATX - Extended Result Codes

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



ITU-T Recommendation V.25 ter

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



ATX[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	configuration value

Values:

0 : send only OK, CONNECT, RING, NO CARRIER, ERROR, NO ANSWER results. Busy tones reporting is disabled

1÷4 : reports all messages

Additional info:

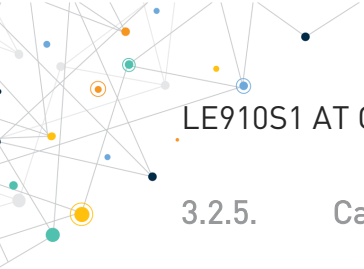
▶▶ <n>=0
EXTENDED MESSAGES: X0=NO

<n>=1 .. 4
EXTENDED MESSAGES : X1=YES



When the <n> parameter is omitted, the command acts like ATX0.





3.2.5. Call (Voice and Data) Control

3.2.5.1. ATD - Dialup Connection

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



ITU-T Recommendation V.25 ter

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



ATD

The **ATD** execution command can assume different formats, which are described in the following Additional info section.

Additional info:

▶▶ **ATD<number>;**

Name	Type	Default	Description
<number>	string	-	phone number to be dialed Accepted characters are 0-9 and *,#,"A", "B", "C", "D", "+". For backwards compatibility with landline modems, modifiers "T", "P", "R", ",", "W", "!", "@" are accepted, but have no effect.



Data Call not supported

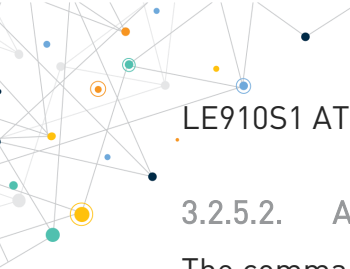


-
- i** The following custom result codes are received, monitoring step by step the call status:

RINGBACK: MO call in progress

CONNECT: remote call accepted

NO CARRIER: remote hang-up



3.2.5.2. ATA - Answer Incoming call

The command is used to answer to an incoming call if automatic answer is disabled.



ITU-T Recommendation V.25 ter

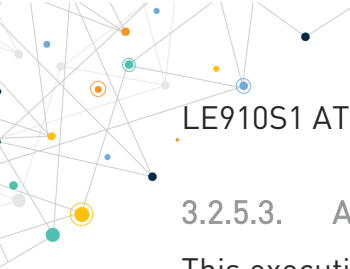
SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Not required	No	No	-	2



ATA

Execution command informs the DCE that answer sequence must be started if automatic answer is disabled.

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



3.2.5.3. ATH - Hang Up/Disconnect the Current Call

This execution command is used to close the current conversation (voice or data).



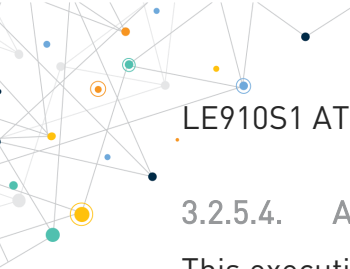
ITU-T Recommendation V.25 ter

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



ATH

- i** This command can be issued only in command mode
- i** When a data conversation is active the device is in on-line mode (commands are not sensed and characters are sent to the other party), hence escape sequence (see register S2) is required before issuing this command, otherwise if **&D1** option is active, DTR pin has to be tied Low to return in command mode.



3.2.5.4. ATO - Return to ON-Line Mode

This execution command is used to return to on-line mode from command mode. If there is no active connection, 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



After issuing this command, if the device is in conversation, to send other commands to the device you must return to command mode by issuing the escape sequence (see register **S2**) or tying low DTR pin if **&D1** option is active.



3.3. Network

3.3.1. 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.

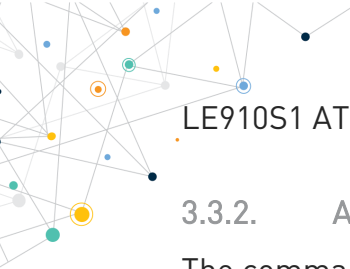


Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the ME memory is returned.



 **AT+COPN=?**

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



3.3.2. 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. The URC short format is displayed every time there is a change in the network registration status. The 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 : unknown
- 5 : registered, roaming
- 6 : registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)
- 7 : registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)
- 8 : attached for emergency bearer services (not applicable)
- 9 : registered for "CSFB not preferred", home network (applicable only when <AcT> indicates E-UTRAN)



		10	: registered for "CSFB not preferred", roaming (applicable only when <AcT> indicates E-UTRAN)
		11	: only emergency services are available
<lac>	string		the parameter reports: Local Area Code when <AcT>=0 Tracking Area Code when <AcT>=7
<ci>	string		Cell Id for the currently registered on cell
<AcT>	integer		access technology of the registered network.

Values:

0	:	GSM
2	:	UTRAN
3	:	GSM w/EGPRS
4	:	UTRAN w/HSDPA
5	:	UTRAN w/HSUPA
6	:	UTRAN w/HSDPA and HSUPA
7	:	E-UTRAN
8	:	EC-GSM-IoT (A/Gb mode)
9	:	E-UTRAN (NB-S1 mode)

- i** <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>.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



Check the registration status of the module.

AT+CREG?

+CREG: 0,2

OK

The module is in network searching state

...

...

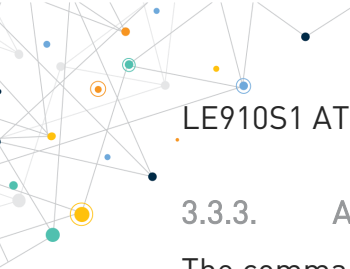
Check again module status

AT+CREG?

+CREG: 0,1

OK

The module is registered



3.3.3. 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>]]]]

Set command forces an attempt to select and register the network operator.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	defines the operator selection: automatic or manual.

Values:

- 0 : automatic selection, the parameter <oper> is ignored
- 1 : manual selection, the parameter <oper> must be present
- 2 : deregister from network. The module is unregistered until a +COPS with <mode>=0, 1 or 4 is issued
- 3 : set only <format> parameter, the parameter <oper> is ignored
- 4 : manual/automatic, <oper> parameter must be present. If manual selection fails, automatic mode (<mode>=0) is entered
- 5 : enable the reporting of searched network operators, *PLMNLIST indication will be reported



<format>	integer	N/A	specifies the operator name format, see <oper> parameter
-----------------------	---------	-----	---

Values:

0 : alphanumeric long form (max length 16 digits)

1 : alphanumeric short form

2 : numeric **<oper>**

<oper>	mixed	-	network operator in format defined by <format> parameter: long alphanumeric format can be up to 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]). numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific.
---------------------	-------	---	--

Returned **<oper>** shall not be in BCD format, but in IRA characters converted from BCD. Hence, the number has the structure: (country code digit 3) (country code digit 2) (country code digit 1) (network code digit 3) (network code digit 2) (network code digit 1).

<AcT>	integer	N/A	selects access technology.
--------------------	---------	-----	----------------------------

Values:

0 : GSM

1 : GSM Compact

2 : UTRAN

3 : GSM w/EGPRS



-
- 4 : UTRAN w/HSDPA
 - 5 : UTRAN w/HSUPA
 - 6 : UTRAN w/HSDPA and HSUPA
 - 7 : E-UTRAN
 - 8 : UTRAN w/HSPA+
 - 9 : E-UTRAN CA
-

- i** 'UNKNOWN' is a value of 'read command' and not of 'set command'. This is a transient state that occur while modem is initialized.
- i** <**mode**> parameter setting is stored in NVM and available at next reboot, if it is not 3 (i.e.: set only <**format**> parameter).
- i** If <**mode**>=1 or 4, the selected network is stored in NVM too and is available at next reboot (this will happen even with a new SIM inserted)
- i** <**format**> parameter setting is never stored in NVM
- i** The network name can only be used among the list of network names displayed by the **+COPN** command when using the manual choice mode with alphanumeric format
- i** 3GPP TS 44.060 specifies the System Information messages which give the information about whether the serving cell supports EGPRS
- i** 3GPP TS 25.331 specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA



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>]

- i** A network name can be displayed with different name from showed network name list by the **+COPN** command if the UE could get a camped network name from USIM or network.

AT+COPS=?

Test command returns a list of quintuplets, each representing an operator present in the network.

The quintuplets in the list are separated by commas:

+COPS: [list of supported (<stat>, long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>,< AcT>)s][,[(list of supported <mode>s)],(list of supported <format>s)]

<stat> and **<AcT>** parameters are described in the Additional info section.

Additional info:


- ▶▶ Meaning of the **<stat>** and **<AcT>** parameters.

Name	Type	Default	Description
<stat>	integer	N/A	operator availability
Values:			
	0	:	unknown
	1	:	available
	2	:	current
	3	:	forbidden
<AcT>	integer	N/A	access technology selected



Values:

- 0 : GSM
 - 1 : GSM Compact
 - 2 : UTRAN
 - 3 : GSM w/EGPRS
 - 4 : UTRAN w/HSDPA
 - 5 : UTRAN w/HSUPA
 - 6 : UTRAN w/HSDPA and HSUPA
 - 7 : E-UTRAN
-

-  Since with this command a network scan is done, this command may require some seconds before the output is given.
-



AT+COPS?

```
+COPS: 0,0,"Test PLMN 1-1",0
```

```
OK
```

AT+COPS=?

```
+COPS: (2,"","","45008",2),(1,"Test PLMN 1-1","Test1-1","00101",0),(3,"","","45005",2),(0-4),(0-2)
```

```
OK
```



3.3.4. 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 or unlock a modem or a network facility.

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	facility

Values:

- "SC" : SIM (PIN request) (device asks SIM password at power-up and when this lock command issued)
- "AO" : BAOC (Barr All Outgoing Calls)
- "OI" : BOIC (Barr Outgoing International Calls)
- "OX" : BOIC-exHC (Barr Outgoing International Calls except to Home Country)
- "AI" : BAIC (Barr All Incoming Calls)
- "IR" : BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
- "AB" : All Barring services (applicable only for <mode>=0)



- "AG" : All outGoing barring services (applicable only for <mode>=0)
- "AC" : All inComing barring services (applicable only for <mode>=0)
- "FD" : SIM fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
- "PN" : network Personalisation
- "PU" : network subset Personalisation
- "PP" : service Provider Personalization (refer 3GPP TS 22.022 [33])
- "PC" : Corporate Personalization (refer 3GPP TS 22.022 [33])
- "PF" : lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)

<mode>	integer	N/A	defines the operation to be done on the facility
Values:			
	0	:	unlock 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 successful, it returns:
**+CLCK: <status>[,<class1>[<CR><LF>+CLCK:
 <status>,<class2>
 [...]]]**

Name	Type	Default	Description
<code><status></code>	integer	N/A	the current status of the facility
Values:			
	0		not active
	1		active
<code><class n></code>	integer	-	class of information of the facility

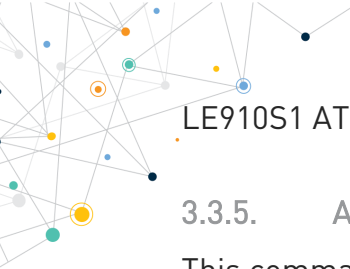
AT+CLCK=?

Test command reports all the facilities supported by the device.



Querying such a facility returns an output on three rows, the first for voice, the second for data, the third for fax:

```
AT+CLCK="A0",2
+CLCK: <status>,1
+CLCK: <status>,2
+CLCK: <status>,4
```



3.3.5. 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

- 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**.

Parameters:

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

<fac>	string	N/A	facility lock function.
-------	--------	-----	-------------------------

Values:

"SC" : SIM (PIN request)

"AB" : All barring services

"P2" : SIM PIN2

"AC" : All inComing barring services

"AG" : All outGoing barring services

"AI" : BAIC (Barr All Incoming Calls)

"AO" : BAOC (Barr All Outgoing Calls)

"IR" : BIC-Roam (Barr Incoming Calls when Roaming outside the home country)




"OI" : BOIC (Barr Outgoing International Calls)

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

<oldpwd>	string	-	old password. it shall be the same as password specified for the facility from the ME user interface or with command +CLCK
-----------------------	--------	---	---

<newpwd>	string	-	new password.
-----------------------	--------	---	---------------

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

AT+CPWD=?

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



AT+CPWD=?

+CPWD:

[""CS"", 16]

[""PS"", 16]

[""PF"", 16]

[""SC"", 16]

[""AO"", 16]

[""OI"", 16]

[""OX"", 16]

[""AI"", 16]

[""IR"", 16]

[""AB"", 16]

[""AG"", 16]

[""AC"", 16]

[""FD"", 16]

[""NT"", 16]

[""NM"", 16]

[""NS"", 16]

[""NA"", 16]

[""PN"", 16]

[""PU"", 16]

[""PP"", 16]

[""PC"", 16]



("**"P2"**", 16)

OK

3.3.6. AT+CLIR - Calling Line Identification Restriction

The command manages the CLIR service.



3GPP TS 27.007

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



AT+CLIR=[<n>]

Set command overrides the CLIR subscription when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. This command refers to CLIR service (see 3GPP TS 22.081), that allows a calling subscriber to enable or disable the presentation of the Calling Line Identification (CLI, i.e., the phone number of the caller) to the called party when originating a call.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	facility status on the Mobile

Values:

- 0 : CLIR facility according to CLIR service network status
- 1 : CLIR facility active (CLI not sent)
- 2 : CLIR facility not active (CLI sent)

- i** This command sets the default behaviour of the device in outgoing calls.

**AT+CLIR?**

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

+CLIR: <n>,<m>

Additional info:



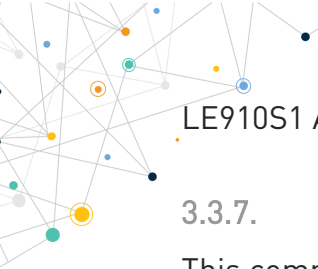
Name	Type	Default	Description
<n>	integer	N/A	facility status in the Mobile
Values:			
0	:	CLIR facility according to CLIR service network status	
1	:	CLIR facility active (CLI not sent)	
2	:	CLIR facility not active (CLI sent)	
<m>	integer	N/A	facility status in the Network
Values:			
0	:	CLIR service not provisioned	
1	:	CLIR service provisioned permanently	
2	:	unknown (e.g. no network present)	
3	:	CLI temporary mode presentation restricted	
4	:	CLI temporary mode presentation allowed	

**AT+CLIR=?**

Test command reports the supported values of parameter <n>



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.3.7. AT+COLP - Connected Line Identification Presentation

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



3GPP TS 27.007

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



AT+COLP=[<n>]

Set command enables/disables the presentation of the COL at the TE. When enabled (and called subscriber allows), the following intermediate result code is returned from TA to TE before any +CR or ITU T Recommendation V.25ter responses:

+COLP: <number>,<type>[,<subaddr>,<satype> [,<alpha>]]

It is manufacturer specific if this response is used when normal voice call is established.

Parameter:

Name	Type	Default	Description
<n>	integer	0	enable/disable COL indication

Values:

0 : disable COL indication

1 : enable COL indication



AT+COLP?

Read command gives the status of <n>, and also triggers an interrogation of the provision status of the COLP service according 3GPP TS 22.081 (given in <m>) in the format:

+COLP: <n>,<m>

Additional info:


▶▶ where

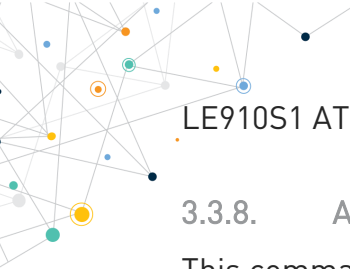
Name	Type	Default	Description
<n>	integer	N/A	COL presentation enabled/disabled
Values:			
0 : COL presentation disabled			
1 : COL presentation enabled			
<m>	integer	N/A	status of the COLP service on the network
Values:			
0 : COLP not provisioned			
1 : COLP provisioned			
2 : unknown (e.g. no network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

AT+COLP=?

Test command returns the range for the parameter <n>.



 ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.3.8. AT+CCFC - Call Forwarding Number And Condition

This command controls the call forwarding supplementary service.



- 3GPP TS 27.007
- GSM 03.82

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



AT+CCFC=<reason>,<cmd>[,<number>[,<type>[,<class>[,<time>]]]]

The execution command controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Parameters:

Name	Type	Default	Description
<reason>	integer	0	reason of call forwarding
Values:			
0	:	unconditional	
1	:	mobile busy	
2	:	no reply	
3	:	not reachable	
4	:	all calls (not with query command)	
5	:	all conditional calls (not with query command)	
<cmd>	integer	0	command parameter
Values:			



- 0 : disable
- 1 : enable
- 2 : query status
- 3 : registration
- 4 : erasure

<number>	string	-	string type phone number of forwarding address in format specified by <type> parameter
<type>	integer	129	type of address octet in integer format
	Values:		
	129	:	National numbering scheme
	145	:	International numbering scheme (contains the character "+")
<class>	integer	-	sum of integers each representing a class of information which the command refers to; default 7 (voice + data + fax)
			1 voice (telephony)
			2 data
			4 fax (facsimile services) (not supported by LTE)
			8 short message service
			16 data circuit sync
			32 data circuit async
			64 dedicated packet access
			128 dedicated PAD access
<time>	integer	20	time in <i>seconds</i> to wait before call is forwarded; it is valid only when <reason> "no reply" is enabled (<cmd> =1) or queried (<cmd> =2)
	Value:		
	1÷30	:	automatically rounded to a multiple of 5 seconds

Additional info:

- ▶▶ when `<cmd>=2` and command successful, it returns:

```
+CCFC: <status>,<class1>[,<number>,<type>[,,,<time>]][<CR><LF>
+CCFC: <status>,<class2>[,<number>,<type>[,,,<time>]][ ... ]]
```

Name	Type	Default	Description
<code><status></code>	integer	0	current status of the network service
Values:			
	0	:	not active
	1	:	active
<code><time></code>	string	-	it is returned only when <code><reason>=2</code> ("no reply") and <code><cmd>=2</code> .

- i** Please see GSM 03.82 for more info.
- i** When querying the status of a network service (`<cmd>=2`) the response line for 'not active' case (`<status>=0`) should be returned only if service is not active for any `<class>`.

AT+CCFC=?

Test command reports supported values for the parameter `<reason>`.



- To check if the unconditional call forwarding is on or off.
AT+CCFC=0,2
- To register the unconditional call forwarding to the network.
AT+CCFC=0,3,"Number"
- To activate the unconditional call forwarding.
AT+CCFC=0,1,"Number"
- To deactivate the unconditional call forwarding.
AT+CCFC=0,0
- Example for Registration & activation:
For registration
AT+CCFC=0,3,"+972575684414"

For activation
AT+CCFC=0,1,"+ 972575684414"



3.3.9. AT+CCWA - Call Waiting

This command allows control of the supplementary service Call Waiting. Activation, deactivation and status query are supported.



3GPP TS 27.007

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



AT+CCWA=[<n>[,<cmd>[,<class>]]]

Set command allows the control of the call waiting supplementary service. Activation, deactivation, and status query supported

The URC has the following format:

+CCWA: <number>,<type>

Parameters:

Name	Type	Default	Description
<n>	integer	0	Enables/disables the presentation of an unsolicited result code
Values:			
0 : disable			
1 : enable			
<cmd>	integer	0	Enables/disables or queries the service at network level
Values:			
0 : disable			
1 : enable			



2 : query status

<class>	integer	-	sum of integers each representing a class of information which the command refers to; default is 7 (voice + data + fax)
		1	voice (telephony)
		2	data
		4	fax (facsimile services) (not supported by LTE)
		8	short message service
		16	data circuit sync
		32	data circuit async
		64	dedicated packet access
		128	dedicated PAD access

Unsolicited fields:

Name	Type	Description
<number>	string	Phone number of calling address in format specified by <type>
<type>	integer	Type of address in integer format Values: 128 : both the type of number and the numbering plan are unknown 129 : Unknown type of number and ISDN/Telephony numbering plan 145 : International type of number and ISDN/Telephony numbering plan (contains the character "+") 161 : National type of number and ISDN/Telephony numbering plan

- i** The response to the query command is in the format:

```
+CCWA: <status>,<class1>[<CR><LF>
+CCWA: <status>,<class2>[ ... ]]
```

where

<status> represents the status of the service:

0 - inactive

1 - active

<class_n> - same as **<class>**

- i** If parameter **<cmd>** is omitted then network is not interrogated.
- i** In the query command the **<class>** parameter must not be issued.
- i** The difference between call waiting report disabling (**AT+CCWA = 0,1,7**) and call waiting service disabling (**AT+CCWA = 0,0,7**) is that in the first case the call waiting indication is sent to the device by network but this last one does not report it to the modem; instead in the second case the call waiting indication is not generated by the network. Hence the device results busy to the third party in the second case, while in the first case a ringing indication is sent to the third party.
- i** The command **AT+CCWA=1,0** has no effect and is a non sense, then must not be issued.



AT+CCWA?

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



AT+CCWA=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.3.10. AT+CHLD - Call Holding Services

The command controls the network call hold service.



3GPP TS 27.007

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



AT+CHLD=[<n>]

Execution command controls the network call hold by the service. With this service, it is possible to disconnect temporarily a call and keep it suspended while it is retained by the network; at the same time it is possible to connect another party or make a multiparty connection.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	the parameter is used to release, activate or add an held call

Values:

- 0 : releases all held calls, or sets the UDUB (User Determined User Busy) indication for a waiting call.
- 1 : releases all active calls (if any exist), and accepts the other (held or waiting) call
- 1X : releases a specific active call X
- 2 : places all active calls (if any exist) on hold and accepts the other (held or waiting) call.
- 2X : places all active calls on hold except call X with which communication shall be supported

-
- 3 : adds an held call to the conversation
 - 4 : connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer (ECT))
-

- i** "X" is the numbering (starting with 1) of the call given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number.
- i** Where both a held and a waiting call exist, the above procedures apply to the waiting call (i.e. not to the held call) in conflicting situation.
- i** For VOLTE conference call $\langle n \rangle = 2X$ and $\langle n \rangle = 4$ parameters are not supported
- i** For VOLTE while no active or held calls option $\langle n \rangle = 3$ starts conference call to conference server without participants

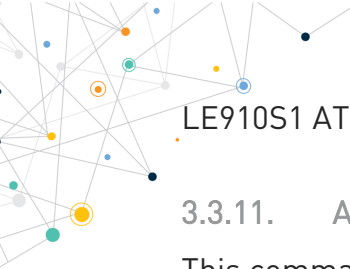
AT+CHLD=?

Test command returns the list of supported values of parameter $\langle n \rangle$. in the format:

+CHLD: (0,1,1X,2,2X,3,4)



The command is only applicable to voice calls.



3.3.11. AT+CDIP - Called line identification presentation

This command is related to a network service that provides "multiple called numbers (called line identifications) service" to an MT.

This command enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call



3GPP TS 24.008

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



AT+CDIP=[<n>]

Set command enables or disables the presentation of the called line identifications at the TE.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	sets/shows the result code presentation status to the TE

Values:

0 : disable

1 : enable

Additional info:

- ▶ When the presentation of the called line identification at the TE is enabled,
+CDIP:<number>,<type>[,<subaddr>,<satype>]
response is returned after every RING (or +CRING: <type>: refer subclause "Cellular result codes +CRC") result code sent from TA to

TE. It is manufacturer specific if this response used when normal voice call answered

Name	Type	Default	Description
<number>	string	-	phone number of format specified by <type>
<type>	integer	-	type of address octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.7)
<subaddr>	string	-	subaddress of format specified by <satype>
<satype>	string	-	type of subaddress octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.8)



AT+CDIP?

Read command gives the status of <n> and also triggers an interrogation of the provision status of the "multiple called numbers" service.

Additional info:

- ▶▶ Read command returns values supported as a compound value.
+CDIP: <n>,<m>

Name	Type	Default	Description
<n>	integer	N/A	sets/shows the result code presentation status to the TE

Values:

- 0 : disable
- 1 : enable



<code><m></code>	integer	N/A	shows the subscriber "multiple called numbers" service status in the network
------------------------	---------	-----	--

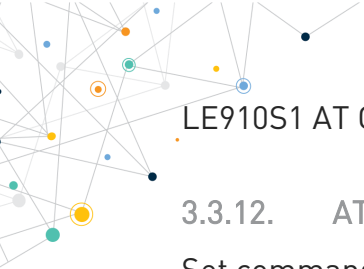
Values:

- 0 : "multiple called numbers service" is not provisioned
 - 1 : "multiple called numbers service" is provisioned
 - 2 : unknown (e.g. no network, etc.)
-



AT+CDIP=?

Test command returns the list of supported values of parameter `<n>`



3.3.12. AT+CUSD - Unstructured Supplementary Service Data

Set command allows control of the Unstructured Supplementary Service Data (USSD 3GPP TS 22.090).



3GPP TS 27.007

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



AT+CUSD=[<n>[,<str>[,<dcs>]]]

The unsolicited result code enabled by parameter <n> is in the format:

+CUSD: <m>[,<str>,<dcs>]

to the TE

Parameters:

Name	Type	Default	Description
<n>	integer	0	disable/enable the presentation of an unsolicited result code
Values:			
0	:	disable the result code presentation in the DTA	
1	:	enable the result code presentation in the DTA	
2	:	cancel an ongoing USSD session (not applicable to read command response)	
<str>	string	-	USSD-string (when <str> parameter is not given, network is not interrogated)



If **<dcS>** indicates that 3GPP TS 3.38/23.038 default alphabet is used ME/TA converts GSM alphabet into current TE character set (see **+CSCS**).

If **<dcS>** indicates that 8-bit data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number; e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65).

<dcS>	integer	-	3GPP TS 23.038 Cell Broadcast Data Coding Scheme in integer format (default is 0).
--------------------	---------	---	--

Unsolicited field:

Name	Type	Description
<m>	integer	Status service value
		Values:
		0 : no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation)
		1 : further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation)
		2 : USSD terminated by the network
		3 : other local client has responded
		4 : operation not supported
		5 : network time out



AT+CUSD?


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

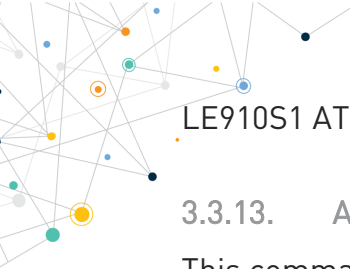
 **AT+CUSD=?**

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



Only mobile initiated operations are supported

-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.3.13. AT+CAOC - Advice of Charge

This command allows the user to get information about the cost of calls and to enable an unsolicited event reporting of the Current Call Meter (CCM) information.



3GPP TS 27.007

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



AT+CAOC=<mode>

Set command refers to the Advice of Charge supplementary services that enable subscriber to get information about the cost of calls; the command also includes the possibility to enable an unsolicited event reporting of the Current Call Meter (CCM) information.

Parameter:

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

<mode>	integer	N/A	mode of presentation of CCM information
--------	---------	-----	---

Values:

0 : query CCM value

1 : disables unsolicited CCM reporting

2 : enables unsolicited CCM reporting

Unsolicited field:

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


<ccm>	hex	The unsolicited result code enabled by parameter <mode> is in the format: +CCCM: <ccm>
-------	-----	--

where:

<ccm> - current call meter in home units, string type:



three bytes of the CCM value in hexadecimal format
(e.g. "00001E" indicates decimal value 30)

-  The unsolicited result code **+CCCM** is sent when the CCM value changes, but not more than every 10 seconds.



AT+CAOC?



Read command reports the value of parameter `<mode>` in the format:
+CAOC: <mode>

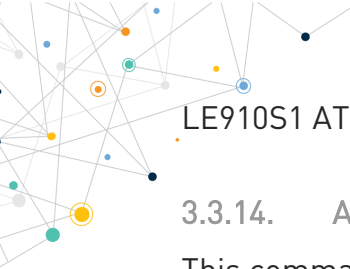


AT+CAOC=?

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



-  **+CAOC** command returns an estimate of the cost of the current call only, produced by the MS and based on the information provided by either AoCI or AOCC supplementary services; it is not stored in the SIM.
-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.3.14. AT+CLCC - List Current Calls

This command returns the list of current calls and their characteristics



3GPP TS 27.007

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



AT+CLCC

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

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

The parameters are described in the Additional info section.

Additional info:

- ▶ List of the parameters meaning.

Name	Type	Default	Description
<idn>	integer	-	call identification number
<dir>	integer	N/A	call direction
Values:			
0 : mobile originated call			
1 : mobile terminated call			
<stat>	integer	N/A	state of the call
Values:			



- 0 : active
- 1 : held
- 2 : dialing (MO call)
- 3 : alerting (MO call)
- 4 : incoming (MT call)
- 5 : waiting (MT call)

<mode> integer N/A call type

Values:

- 0 : voice
- 1 : data
- 2 : fax (not supported by LTE)
- 9 : unknown

<mpty> integer N/A multiparty call flag

Values:

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

<number> string - phone number in format specified by **<type>**

<type> integer N/A type of phone number octet in integer format

Values:

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

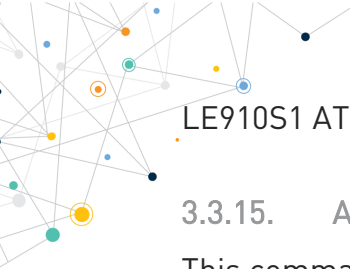


<alpha>	string	-	alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with +CSCS
----------------------	--------	---	---

- i** If no call is active then only **OK** message is sent.
- i** This command is useful in conjunction with command **+CHLD** to know the various call status for call holding.
- i** In VOLTE conference call participant's numbers start with "sip:" or "tel:", for example: sip:+12125551212

AT+CLCC=?

Test command returns **OK** result code



3.3.15. AT+CSSN - SS Notification

This command refers to supplementary service related network initiated notifications.



3GPP TS 27.007

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



AT+CSSN=[<n>[,<m>]]

Set command enables/disables the presentation of notification result codes from **TA** to **TE**.

Parameters:

Name	Type	Default	Description
<n>	integer	0	Set +CSSI result code presentation status When <n>=1 and a supplementary service notification is received after a mobile originated call setup, an unsolicited code is sent to TE before any other MO call setup result codes +CSSI: <code1>
Values:			
0 : disable			
1 : enable			
<m>	integer	0	Sets the +CSSU result code presentation status When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, an unsolicited result code is sent to TE +CSSU: <code2>

Values:

0 : disable

1 : enable

Unsolicited fields:


Name	Type	Description
<code1>	integer	+CSSI supplementary service notification. Values: 0 : unconditional call forwarding is active 1 : some of the conditional call forwardings are active 2 : call has been forwarded 3 : call is waiting 5 : outgoing calls are barred 6 : incoming calls are barred
<code2>	integer	+CSSU supplementary service notification. Values: 0 : this is a forwarded call (MT call setup) 2 : call has been put on hold (during a voice call) 3 : call has been retrieved (during a voice call) 4 : multiparty call entered (during a voice call) 5 : call on hold has been released (this is not a SS notification) (during a voice call)



AT+CSSN?


Read command reports the current value of the parameters.



 **AT+CSSN=?**

Test command reports the supported range of values for parameters <n>, <m>.



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.3.16. AT+CPOL - Preferred Operator List

This command is used to edit or update the SIM preferred list of networks.



3GPP TS 27.007

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

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

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

Execution command writes an entry in the SIM list of preferred operators

Parameters:

Name	Type	Default	Description
<index>	integer	N/A	the order number of operator in the SIM preferred operator list.
		Value:	
		1÷n	: order number in the list
<format>	integer	N/A	format for <oper> parameter.
		Values:	
		0	: long format alphanumeric <oper>
		1	: short format alphanumeric <oper>
		2	: numeric
<oper>	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.
-------------------	---------	-----	--------------------------------

Values:

0 : access technology not selected

1 : access technology selected

<UTRAN_Act>	integer	N/A	UTRAN access technology.
-------------	---------	-----	--------------------------

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

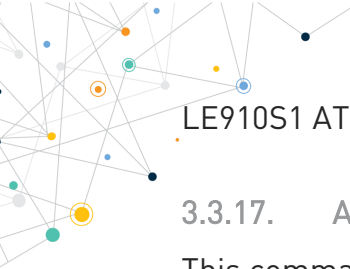
-
- i** If <index> is used, and <oper> is not entered, the entry is deleted from the list of preferred operators.
 - i** If <oper> is used, and <index> is not used, <oper> is put in the next free location.
 - i** If only <format> is entered, the format of the <oper> in the read command is changed.
 - i** Currently <GSM_Compact_Act> not supported but set value is acceptable.

**AT+CPOL?**

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

**AT+CPOL=?**

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



3.3.17. AT+CPLS - Selection of Preferred PLMN List

This 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



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

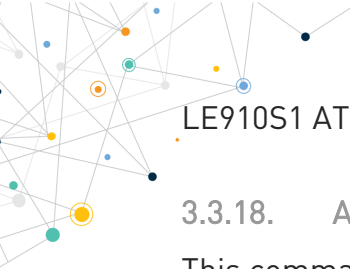
**AT+CPLS?**

Read command returns the selected PLMN selector list from the SIM/USIM

+CPLS: <list>

**AT+CPLS=?**

Test command returns the whole index range supported lists by the SIM /USIM



3.3.18. AT+CSQ - Signal Quality

This command reports received signal quality indicators.



3GPP TS 27.007

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



AT+CSQ

Execution command reports received signal quality indicators in the form:

+CSQ: <rssi>,<sq>

See Additional info section.

Additional info:

▶▶ 3GPP

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

<rssi>	integer	N/A	received signal strength indication
--------	---------	-----	-------------------------------------

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

▶▶ TDSCDMA

Name	Type	Default	Description
<rssi>	integer	N/A	received signal strength indication
Values:			
100	:	-116 dBm or less	
101	:	-115 dBm	
102÷191	:	from -114 dBm to -26 dBm	
191	:	-25 dBm or greater	
199	:	not known or not detectable	

▶▶ 2G (GSM)

Name	Type	Default	Description
<sq>	integer	N/A	signal quality - RXQUAL [bit error rate (in percent)]
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

▶▶ 3G (UTRAN)

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

<sq>	integer	N/A	signal quality - ECIO [in dBm]
------	---------	-----	--------------------------------

Values:

0 : -1 to 0

1 : -5 to -2

2 : -8 to -6

3 : -11 to -9

4 : -15 to -12

5 : -18 to -16

6 : -22 to -19

7 : -24 to -23

99 : not known or not detectable

▶▶ 4G (LTE)


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

<sq>	integer	N/A	signal quality - RSRQ [in dBm]
------	---------	-----	--------------------------------

Values:



0	:	-4 to -3
1	:	-6 to -5
2	:	-8 to -7
3	:	-10 to -9
4	:	-13 to -11
5	:	-15 to -14
6	:	-17 to -16
7	:	-19 to -18
99	:	not known or not detectable

-  This command should be used instead of the **%Q** and **%L** commands, since GSM/WCDMA relevant parameters are the radio link ones and no line is present, hence **%Q** and **%L** have no meaning

AT+CSQ=?

Test command returns the supported range of parameters values according to the network on which the module is registered.

Although **+CSQ** is an execution command without parameters, 3GPP TS 27.007 requires the Test command to be defined.



3.3.19. AT#SERVINFO - Serving Cell Information

This command reports information about the serving cell.

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

AT#SERVINFO

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

GSM network

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

WCDMA network

#SERVINFO:<UARFCN>,<dBm>,[<NetNameAsc>],<NetCode>,<PSC>,<LAC>,<DRX>,<SD>,<RSCP>,<NOM>,<RAC>,<URA>

LTE network

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

The parameters are described in the Additional info sections.

Additional info:

- ▶▶ Parameters meaning.

Name	Type	Default	Description
<BARFCN>	integer	-	BCCH ARFCN of the serving cell
<dBm>	integer	-	received signal strength in dBm.
<NetNameAsc>	string	-	operator name, quoted string or "" if network name is unknown.



<NetCode>	hex	-	country code and operator code.
<BSIC>	string	-	Base Station Identification Code
<LAC>	integer	-	Localization Area Code
<TA>	integer	-	Time Advance: it is available only if a GSM or GPRS is running.
<GPRS>	integer	0	GPRS supported in the cell

Values:

0 : not supported

1 : supported

- The following informations will be present only if GPRS is supported in the cell.

Name	Type	Default	Description
<PBARFCN>	integer	-	Not supported by 3GPP. PBCCH ARFCN of the serving cell; it is printed only if PBCCH is supported by the cell, otherwise the label "hopping" will be printed
<NOM>	string	N/A	Network Operation Mode

Values:

"I" : Network Mode I

"II" : Network Mode II

"III" : Network Mode III

<PAT>	integer	N/A	Priority Access Threshold.
-------	---------	-----	----------------------------

Values:

0 : Priority Access Threshold

3÷6 : Priority Access Threshold

►► Parameters meaning.

Name	Type	Default	Description
<UARFCN>	integer	-	UMTS ARFCN of the serving cell
<PSC>	integer	-	Primary Scrambling Code

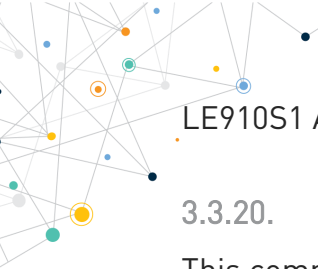
►► Parameters meaning.

Name	Type	Default	Description
<DRX>	integer	-	Discontinuous reception cycle length.
<SD>	integer	N/A	Service Domain
Values:			
0 : No Service			
1 : CS only			
2 : PS only			
3 : CS & PS			
<RSCP>	integer	-	Received Signal Code Power in dBm.
<EARFCN>	integer	-	E-UTRA Assigned Radio Channel
<PhysicalCellId>	integer	-	Physical Cell ID
<TAC>	integer	-	Tracking Area Code
<RSRP>	integer	-	Reference Signal Received Power
<URA>	integer	-	UTRAN Registration Area Identity



?  AT#SERVINFO=?

Test command returns **OK** result code.



3.3.20. AT#AUTOBND - Automatic Band Selection

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

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

AT#AUTOBND=[<value>]

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

Parameter:

Name	Type	Default	Description
<value>	integer	2	dummy values (It has no effect and is included only for backward compatibility)

Values:

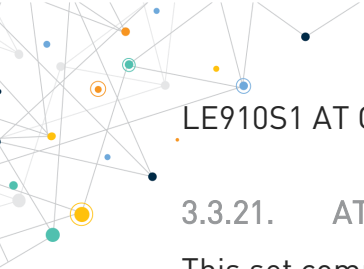
- 0 : only for backward compatibility.
- 1 : only for backward compatibility.
- 2 : only for backward compatibility.

AT#AUTOBND?

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

AT#AUTOBND=?

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



3.3.21. AT+CEMODE - Set Mode of Operation for EPS

This set command configures the mode of operation for EPS.

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	1	mode of operation.

Values:


- 0 : PS mode 2 of operation
- 1 : CS/PS mode 1 of operation
- 2 : CS/PS mode 2 of operation
- 3 : PS mode 1 of operation

-  The definition for UE modes of operation can be found in 3GPP TS 24.301. Other values are reserved and will result in an **ERROR** response to the set command.
-  **AT+CEMODE=6** returns **ERROR**

AT+CEMODE?

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

+CEMODE: < mode >

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

AT+CEMODE=?

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

+CEMODE: {0-3}



Set EPS mode
AT+CEMODE=1
OK

Check EPS mode
AT+CEMODE?
+CEMODE: 1
OK



3.3.22. AT+CESQ - Extended Signal Quality

This command reports received signal quality indicators.



3GPP TS 27.007

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



AT+CESQ

Execution command reports the signal quality indicators. See Additional info section.

Additional info:

- ▶▶ The execution command returns the following message:

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

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

<rxlev>	integer	N/A	received signal strength level, see 3GPP document, subclause 8.1.4
---------	---------	-----	--

Values:

0 : rssi < -110 dBm

1 : $-110 \leq \text{rssi} < -109$ dBm

2 : $-109 \leq \text{rssi} < -108$ dBm

... : ...

61 : $-50 \leq \text{rssi} < -49$ dBm



62 : $-49 \leq \text{rssi} < -48$ dBm

63 : $\text{rssi} \geq -48$ dBm

99 : not known or not detectable or if the current serving cell is not a GERAN cell

<ber> integer N/A bit error rate [in percent]

Values:

0÷7 : as RXQUAL values in the table in 3GPP TS 45.008 subclause 8.2.4

99 : not known or not detectable or if the current serving cell is not a GERAN cell

<rscp> integer N/A received signal code power. See 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3.

Values:

0 : $\text{rscp} < -120$ dBm

1 : $-120 \leq \text{rscp} < -119$ dBm

2 : $-119 \leq \text{rscp} < -118$ dBm

... : ...

94 : $-27 \leq \text{rscp} < -26$ dBm

95 : $-26 \leq \text{rscp} < -25$ dBm

96 : $\text{rscp} \geq -25$ dBm

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

<ecno> integer N/A ratio of the received energy per PN chip to the total received power



spectral density. See 3GPP TS 25.133 subclause.

Values:

- 0 : $E_c/I_o < -24$ dB
- 1 : $-24 \leq E_c/I_o < -23.5$ dB
- 2 : $-23,5 \leq E_c/I_o < -23$ dB
- ... : ...
- 47 : $-1 \leq E_c/I_o < -0,5$ dB
- 48 : $-0,5 \leq E_c/I_o < 0$ dB
- 49 : $E_c/I_o \geq 0$ dB
- 255 : not known or not detectable detectable or if the current serving cell is not a UTRA cell

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

Values:


- 0 : $rsrq < -19.5$ dB
- 1 : $-19.5 \leq rsrq < -19.0$ dB
- 2 : $-19.0 \leq rsrq < -18.5$ dB
- 3÷33 : $-18.5 \leq rsrq < -3.0$ dB; 0.5 dB per step
- 34 : $rsrq \geq -3.0$ dB
- 255 : not known or not detectable or if the current serving cell is not a EUTRA cell

<rsrp>	integer	N/A	reference signal received power, see 3GPP TS36.133 subclause 9.1.4.
---------------------	---------	-----	---

Values:



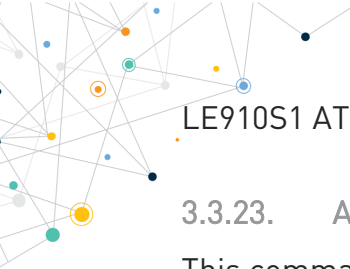
0	:	rsrp < -140 dBm
1	:	-140 ≤ rsrp < -139 dBm
2	:	-139 ≤ rsrp < -138 dBm
3÷96	:	-138 ≤ rsrp < -44; 1 dBm per step
97	:	rsrp ≥ -44 dBm
255	:	not known or not detectable or if the current serving cell is not a EUTRA cell

 4G/3G only products do not support GSM access technology



AT+CESQ=?

Test command returns the supported range of values of the parameters <rxlev>, <ber>, <rscp>, <ecno>, <rsrq>, <rsrp>.



3.3.23. 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 . The values in <n> for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned. The factory default value depends on each variant

Values:

- 12 : GSM Digital Cellular Systems, GERAN only
- 22 : UTRAN only
- 25 : 3GPP Systems (GERAN and UTRAN and E-UTRAN)
- 28 : E-UTRAN only
- 29 : GERAN and UTRAN
- 30 : GERAN and E-UTRAN



-
- 31 : UTRAN and E-UTRAN
 - 32 : TDSCDMA only
 - 33 : GERAN and TDSCDMA
 - 34 : TDSCDMA and E-UTRAN
 - 35 : GERAN and TDSCDMA and E-UTRAN
 - 36 : GERAN and TDSCDMA and UTRAN and E-UTRAN
 - 37 : GERAN and TDSCDMA and UTRAN
 - 38 : TDSCDMA and UTRAN
 - 39 : TDSCDMA and UTRAN and E-UTRAN
-

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



AT+WS46?

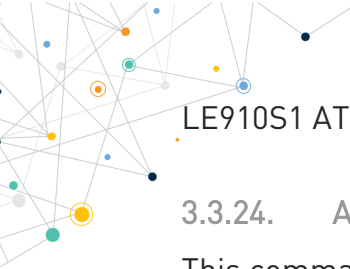
Read command reports the currently selected cellular network, in the format:

+ WS46: <n>



AT+WS46=?

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



3.3.24. AT+CEREG - EPS Network Registration Status

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



3GPP TS 27.007

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



AT+CEREG=[<n>]

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

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

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

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables the network registration unsolicited result code (URC), and selects one of the available formats.

Values:




- 0 : disable the network registration unsolicited result code
- 1 : enable network registration unsolicited result code; if there is a change in the terminal EPS network registration status, it is issued the URC short format
- 2 : enable network registration and location information unsolicited result code; if there is a change of the



network cell, it is issued the URC long format (includes the network cell identification data)

Unsolicited fields:

Name	Type	Description
<stat>	integer	registration status Values: 0 : not registered, terminal is not currently searching a new operator to register to 1 : registered, home network 2 : not registered, but terminal is currently searching a new operator to register to 3 : registration denied 4 : unknown. Example, out of E-UTRAN coverage 5 : registered, roaming
<tac>	string	tracking area code (two bytes) in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string	four byte E-UTRAN cell ID in hexadecimal format
<AcT>	integer	indicates the access technology of the serving cell. Values: 0 : GSM (not applicable) 1 : GSM Compact (not applicable) 2 : UTRAN (not applicable) 3 : GSM w/EGPRS (not applicable) 4 : UTRAN w/HSDPA (not applicable) 5 : UTRAN w/HSUPA (not applicable) 6 : UTRAN w/HSDPA and HSUPA (not applicable) 7 : E-UTRAN


-  **<tac>**, **<ci>** and **<AcT>** are reported only if **<n>=2** and the mobile is registered on some network cell.
-  3GPP TS 44.060 specifies the System Information messages which give the information about whether the serving cell supports EGPRS.
-  3GPP TS 25.331 specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.



AT+CEREG?

Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format:

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


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

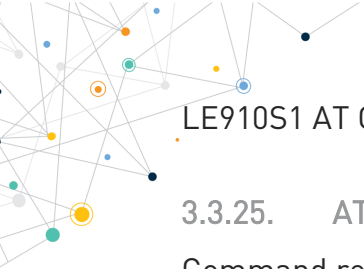


AT+CEREG=?

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



-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.3.25. AT#RFSTS - Read Current Network Status

Command reads current network status.

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

AT#RFSTS

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

GSM network

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

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

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

Parameter/values	Description
<RR>	Radio Resource state (for debug purpose only)
-	Ignore these values

Parameters	Descriptions
<NOM>	Network Operator Mode

<CID>	Cell ID
<IMSI>	International Mobile Subscriber Identity
<NetNameAsc>	Operator name

Parameter/values	Description
<SD>	Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

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

LTE network

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

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

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

Parameters	Description
<RRC>	Radio Resource state (for debug purpose only)
-	Ignore these values

Parameters	Description
<CID>	Cell ID
<IMSI>	International Mobile Station ID
<NetNameAsc>	Operator name

Parameter/values	Description
<SD>	Service Domain
0	No Service
1	CS only
2	PS only
3	CS+PS

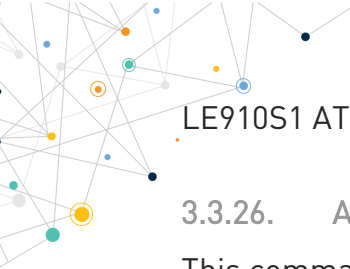
Parameters/values	Description
<ABND>	Active Band
1..63	According to 3GPP TS 36.101

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

? AT#RFSTS=?

Test command tests for command existence.





3.3.26. AT#MONI - Cell Monitor

This command is both a set and an execution command.

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

AT#MONI[=[<number>]]

Set command sets one cell out of seven, in a neighbor list of the serving cell including it, from which extract GSM/LTE related information. After entering the set command, enter the execution command **AT#MONI<CR>** to get the GSM/LTE related information for the selected cell and dedicated channel (if exists) in the format shown, for each network, in the Additional info section.

Parameter:

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

Additional info:

- ▶▶ GSM network

Name	Type	Default	Description
<number>	integer	0	GSM network

Values:

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

seven cells in the neighbor list of the serving cell

►► LTE network

Name	Type	Default	Description
<number>	integer	0	LTE network

Values:

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

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

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

GSM network

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

LTE network



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

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

GSM network

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

LTE network

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

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

GSM network

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

LTE network

LTE intra-frequency and inter-frequency cells

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

LTE GSM neighbor cells

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

Name	Type	Default	Description
<netname>	string	-	name of network operator
<cc>	string	-	country code

<nc>	string	-	network operator code
<n>	integer	-	progressive number of adjacent cell
<bsic>	string	-	base station identification code
<qual>	integer	-	quality of reception: 0..7
<lac>	string	-	localization area code
<id>	integer	-	cell identifier
<arfcn>	integer	-	assigned radio channel
<dBm>	integer	-	received signal strength in dBm.
<timadv>	integer	-	timing advance
<rscp>	integer	-	Received Signal Code Power in dBm.
<drx>	string	-	Discontinuous reception cycle length
<physicalCellId>	integer	-	physical cell identifier
<rsrp>	integer	-	Reference Signal Received Power
<rsrq>	integer	-	Reference Signal Received Quality
<tac>	integer	-	Tracking Area Code
<earfcn>	integer	-	E-UTRA Assigned Radio Channel
<QRxLevMin>	integer	-	minimum required RX level in the cell

i TA: <timadv> reported only for the serving cell.

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

AT#MONI=?

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

#MONI: {<MaxCellNo>,<CellSet>}

Additional info:

- ▶▶ Parameters meaning.

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



The module supports GSM network

```
AT+WS46?
```

```
+WS46: 30
```

```
OK
```

```
AT+CREG?
```

```
+CREG: 0,1
```

```
OK
```

```
AT#MONI=1
```

```
OK
```

```
AT#MONI=?
```

```
#MONI: (6,1)
```

```
OK
```

```
AT#MONI
```

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

```
OK
```

```
AT#MONI=7
```

```
OK
```

```
AT#MONI=?
```

```
#MONI: (6,7)
```

```
OK
```

```
AT#MONI
```

```
#MONI: Cell BSIC LAC CellId ARFCN Power C1 C2 TA RxQual PLMN
```

```
#MONI: S 25 D5BD 3A27 1018 -74dbm 31 31 4 7 I TIM
```

```
#MONI: N1 26 D5BD 3A26 1023 -79dbm -1 -1
```

```
#MONI: N2 21 D5BD 5265 1009 -78dbm -1 -1
```

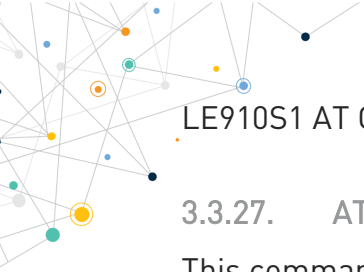
```
#MONI: N3 27 D5BD 5266 13 -87dbm -1 -1
```

```
#MONI: N4 25 D5BD 5251 1020 -88dbm -1 -1
```

```
#MONI: N5 27 D5BD 5286 1011 -95dbm -1 -1
```

```
#MONI: N6 30 00D2 C5A0 16 -99dbm -1 -1
```

```
OK
```



3.3.27. AT+CLIP - Calling Line Identification Presentation

This command enables/disables the presentation of the CLI (Calling Line Identity).



3GPP TS 27.007

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



AT+CLIP=[<n>]

Set command refers to the supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. If enabled the device reports after each **RING** the response:

+CLIP: <number>,<type>

Parameter:

Name	Type	Default	Description
<n>	integer	0	enables/disables CLI indication.

Values:

0 : disable

1 : enable

Unsolicited fields:

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

Values:



-
- 128 : both the type of number and the numbering plan are unknown
 - 129 : unknown type of number and ISDN/Telephony numbering plan
 - 145 : international type of number and ISDN/Telephony numbering plan (contains the character "+")
 - 161 : National type of number and ISDN/Telephony numbering plan
-

- i in the **+CLIP:** response they are currently not reported either the *subaddress* information (it's always "" after the 2nd comma) and the *subaddress type* information (it's always 128 after the 3rd comma)
-

**AT+CLIP?**

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

+CLIP: <n>,<m>

Additional info:


- ▶▶ Parameters:

Name	Type	Default	Description
<n>	integer	N/A	status of the local setting
Values:			
0			CLI presentation disabled
1			CLI presentation enabled
<m>	integer	N/A	status of the CLIP service on the network



Values:

- 0 : CLIP not provisioned
 - 1 : CLIP provisioned
 - 2 : unknown (e.g. no network is present)
-


 Read command issues a status request to the network, hence it may take a few seconds to give the answer due to the time needed to exchange data with it.

 **AT+CLIP=?**

Test command returns the supported values of parameter <n>



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

 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.4. SIM

3.4.1. AT+SWITCHSIM - Set master SIM

This command sets the master SIM. Only applied for dual-SIM projects

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

AT+SWITCHSIM=<simID>

Set command is used to set the master SIM.

Parameter:

Name	Type	Default	Description
<simID>	integer	0	SIM identifier

Values:

0 : SIM 1

1 : SIM2

AT+SWITCHSIM?

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

+SWITCHSIM: <simID>

OK

AT+SWITCHSIM=?

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



This command can be used for dual SIM card switching only through UART port.
USB port not supported.

3.4.2. 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 the device a necessary password before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.).

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

This second pin, **<newpin>** will replace the old pin in the SIM.

The command may be used to change the SIM PIN by sending it with both parameters **<pin>** and **<newpin>** when PIN request is pending; if no PIN request is pending the command will return an error code and to change the PIN the command **+CPWD** must be used instead.

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

- i** To check the status of the PIN request use the command **AT+CPIN?**
- i** If all parameters omitted then the behavior of Set command is the same as Read command.

**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 start-up depends on PIN facility setting, to change or query the default power up setting use the command **AT+CLCK=SC,<mode>,<pin>**
- i** After reboot SIM in state "READY" (always) if SIM inserted and active

AT+CPIN=?

Test command returns **OK** result code.



What follows is a list of the commands which are accepted when ME is pending SIM PIN or SIM PUK

A	+COPS	+CHUP	+GMR
D	+CLIP	+FCLASS	+CGSN
H	+CPAS	+IPR	+GSN
O	+CFUN	+IFC	+CPIN
E	+CGMI	+CRC	+CSQ
I	+CGMM	+CRLP	+CCLK
Q	+CGMR	+GMI	+CREG
V	+CRSM	+GMM	+CMEE
Z	+CLAC	+CGREG	
X	+CNMI	+CSDH	

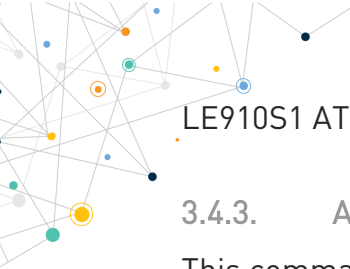
All the above commands, but **+CSDH** and **+CNMI**, can be issued even if ME is waiting for phone-to-SIM card password to be given



```
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
```



3.4.3. AT#PCT - Display PIN Counter

This command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, if **+CPIN** password is required.

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

AT#PCT

Execution command reports the PIN/PUK or PIN2/PUK2 input remaining attempts, depending on **+CPIN** requested password, in the format:

#PCT: <n>

Additional info:

- ▶▶ Here is shown the parameter meaning.

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

<n>	integer	N/A	remaining attempts.
-----	---------	-----	---------------------

Values:

- 0 : the SIM is blocked
- 1÷3 : if the device is waiting either SIM PIN or SIM PIN2 to be given.
- 1÷10 : if the device is waiting either SIM PUK or SIM PUK2 to be given.

AT#PCT=?

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

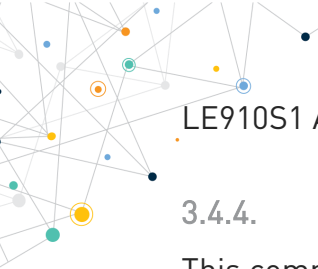


```
AT+CPIN?  
+CPIN: SIM PIN  
OK
```

```
AT#PCT Check PIN remained counter  
#PCT: 3  
OK
```

```
AT+CPIN=1111 Input incorrect PIN number  
+CME ERROR: incorrect password
```

```
AT#PCT  
#PCT: 2  
OK
```



3.4.4. 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**.

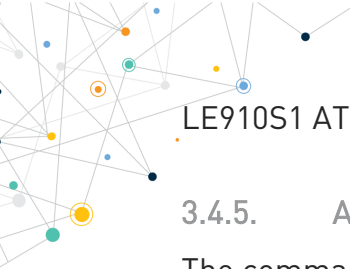


AT+CIMI=?

Test command returns **OK** result code



```
AT+CIMI
22201701202507
OK
```

3.4.5. AT#SIMDET - SIM Detection Mode

The command manages the SIM Detection mode.



[1] Telit Hardware Design Guide of the used module.

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



AT#SIMDET=<mode>

Set command simulates the SIM status, or selects the automatic SIM Detection status. This command is used by modules providing the dedicated SIMIN pin. Refer to document [1] to have information on dedicated SIMIN pin.

Parameter:

Name	Type	Default	Description
<mode>	integer	2	SIM detection mode

Values:

- 0 : ignore dedicated SIMIN pin and simulate the status "SIM Not Inserted"
- 1 : ignore dedicated SIMIN pin and simulate the status "SIM Inserted"
- 2 : automatic SIM detection using dedicated SIMIN Pin

- i** When **#SIMDET=1** (that simulates "SIM Inserted") is issued, a query to detect the presence of the SIM is forced, regardless of SIMIN pin status.
- If SIM is not responding (for example, because it is not present) then, after a timeout, the modem gives up and sets the SIM status to SIM NOT INSERTED.
- If SIM is correctly answering to queries then SIM status becomes SIM READY.

AT#SIMDET?

Read command returns the currently selected Sim Detection Mode in the format:

#SIMDET: <mode>,<simIn>

Additional info:

- ▶▶ The values for <simIn> are:

Name	Type	Default	Description
<simIn>	integer	N/A	SIMIN pin status.

Values:

- 0 : SIM not inserted
1 : SIM inserted

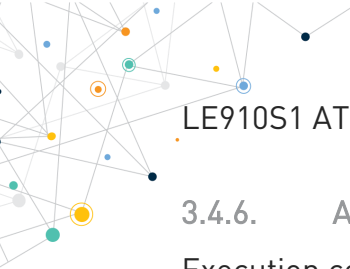
AT#SIMDET=?

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



- ⚠** ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"





3.4.6. 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
```

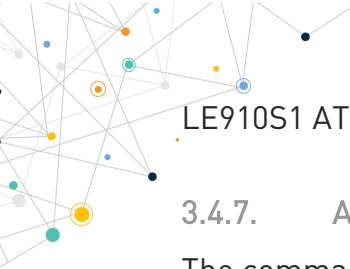


AT#CCID=?

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



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



3.4.7. AT+CRSM - Restricted SIM access

The command transmits to the UICC some specific commands and their required parameters.



3GPP TS 11.11
3GPP TS 27.007
3GPP TS 51.011

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



AT+CRSM=<command>[,<fileId>[,<P1>[,<P2>[,<P3>[,<data>]]]]]

Set command transmits to the UICC the specific command and its required parameters. The command response shows the status words and response data returned by the UICC in the format:

+CRSM: <sw1>,<sw2>[,<response>]

For parameters meanings see Additional info section.

Parameters:

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

<command>	integer	176	command passed on to the UICC
------------------------	---------	-----	-------------------------------

Values:

- 176 : READ BINARY
- 178 : READ RECORD
- 192 : GET RESPONSE
- 214 : UPDATE BINARY

220 : UPDATE RECORD

242 : STATUS

<fileId>	integer	-	identifier of an elementary data file on UICC; mandatory for every command except STATUS
<P1>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
	Value:		
	0÷255	:	parameter P1 passed on to the UICC in a command APDU
<P2>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
	Value:		
	0÷255	:	parameter P2 passed on to the UICC in a command APDU
<P3>	integer	0	parameter passed on to the UICC; it is mandatory for every command except GET RESPONSE and STATUS
	Value:		
	0÷255	:	parameter P3 passed on to the UICC in a command APDU
<data>	string	-	information to be read from UICC or written to the UICC (hexadecimal character format).

Additional info:

►► Response data fields:

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

<sw1>	integer	-	information from the UICC about the execution of the actual command (successful or failed)
<sw2>	integer	-	information from the UICC about the execution of the actual command (successful or failed)
<response>	hex	-	on a successful completion of the previously issued command it shows the response data. It is not returned after a successful UPDATE BINARY or UPDATE RECORD command

- i** This command requires PIN authentication. However commands READ BINARY and READ RECORD can be issued before PIN authentication and if the SIM is blocked (after three failed PIN authentication attempts) to access the contents of the Elementary Files.
- i** Use only decimal numbers for parameters **<command>**, **<fileid>**, **<P1>**, **<P2>** and **<P3>**.

AT+CRSM=?

Test command returns the **OK** result code



</>Read binary, ICCID(2FE2)

AT+CRSM=176,12258,0,0,10
+CRSM: 144,0,982850702001107686F4
OK

Read record, ADN(6F3A)

AT+CRSM=178,28474,1,4,40
+CRSM:
144,0,42434A554EFFFFFFFFFFFFFFFFFFFFFFFF06811056789282FFFFFFFFFFFFFFFF
OK

Update Binary, KcGPRS(6F52)

AT+CRSM=214,28539,0,0,8,C69018C7958C87
+CRSM: 144,0
OK

Update Record, ADN(6F3A)

AT+CRSM=220,28474,9,4,30,657469FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFF FFFFFFFFFF
+CRSM: 144,0
OK

Status, FPLMN(6F7B)

AT+CRSM=242,28539
+CRSM:144,0,623C820238218410A0000000871002FFFFFFFF89040300FFA511800131
81030 10A3282011E8304000030E08A01058B032F0609C6099001C0830101830181
OK



3.4.8. AT+CSIM - Generic SIM Access

This command sends a **<command>** to the SIM/UICC.

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

AT+CSIM=<length>,<command>

Set command transmits to the MT the **<command>**; it then shall send as it is to the SIM. In the same manner the SIM **<response>** shall be sent back by the MT to the TA as it is. Refer subclause 9.2 for **<err>** values.

This command allows a direct control of the SIM by an distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS.

The response message of the command is in the format:

+CSIM: <length>,<response>

Error case:

+CME ERROR: <err>

The response message parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<length>	integer	-	Number of the characters that are sent to TE in <command> (two times the actual length of the command)
<command>	string	-	Command passed on by the ME to the SIM/UICC in the format as described in standard GSM 51.011 (hexadecimal character format; refer +CSCS)

Additional info:

- List of the meaning of the response message parameters.

Name	Type	Default	Description
<lenght>	string	-	see Parameter section.
<response>	string	-	response to the command passed on by the SIM to the ME in the format as described in standard GSM 51.011 (hexadecimal character format; refer +CSCS)
<err>	string	N/A	error values (numeric format followed by verbose format).

Values:

- 3 : operation not allowed (operation mode is not allowed by the ME, wrong interface lock/unlock status)
- 4 : operation not supported (wrong format or parameters of the command)
- 13 : SIM failure (SIM no response)

- i** Compared to Restricted SIM Access command **+CRSM**, the definition of **+CSIM** allow TE to take more control over the SIM-MT interface. The locking and unlocking of the interface may be by a special **<command>** value or automatically by TA/MT (by interpreting **<command>** parameter). In case that TE application does not use the unlock command (or does not send a **<command>** causing automatic unlock) in a certain timeout value, MT may release the locking.

AT+CSIM=?

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





3.4.9. 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	-	<p>session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.</p> <p>Session Id is used when sending commands with Restricted UICC Logical Channel access +CRLA, or Generic UICC Logical Channel access +CGLA commands.</p>

- 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.

3.4.10. AT+CCHC - Close Logical Channel

Close a communication session.



3GPP TS 27.007

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.

Parameter:

Name	Type	Default	Description
<sessionId>	integer	-	a session ID to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism

Additional info:

- ▶▶ Error case:
+CME ERROR: <err>

Name	Type	Default	Description
<err>	integer	N/A	possible <err> values (numeric format followed by verbose format)

Values:

- 3 : operation not allowed (operation mode is not allowed by the ME)
 - 4 : operation not supported (wrong format or parameters of the command)
 - 13 : SIM failure (SIM response SW1 SW2 status byte Error)
 - 15 : SIM wrong (SIM response SW1 SW2 status byte Error)
 - 21 : invalid index (not correspond to an opened channel)
 - 100 : unknowns (generic error)
-

 **AT+CCHC=?**

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



3.4.11. AT+CGLA - Generic UICC Logical Channel Access

This command is used to control the currently selected UICC on the TE.



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

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



AT+CGLA=<sessionId>,<length>,<command>

Set command transmits to the MT the <command> it then shall send as it is to the selected UICC. In the same manner the UICC <response> shall be sent back by the MT to the TA as it is. This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing the received UICC information. The response of the command is in the format:

+CGLA: <length>,<response>

Error case:

+CME ERROR: <err>

The response messages parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<sessionId>	integer	-	this parameter is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting applications on the

			smart card using a logical channel other than the default channel (channel "0"). <sessionId> is returned by the +CCHO command.
<length>	integer	-	characters number of the <command> sent to UICC (two times the actual length of the command)
<command>	string	-	command passed on by the MT to the UICC in the format as described in standard [1] or [2] (hexadecimal character format; refer to +CSCS).

Additional info:

- ▶▶ List of the meaning of the response messages parameters.

Name	Type	Default	Description
<length>	integer	-	characters number of the <response> sent to TE (two times the actual length of the response)
<response>	string	-	response to the command passed on by the UICC to the TE in the format as described in standard [1] or [2] (hexadecimal character format) See standard [2] for more information about defined values
<err>	string	N/A	error values (numeric format followed by verbose format)

Values:

- 3 : operation not allowed (operation mode is not allowed by the ME)
- 4 : operation not supported (wrong format or parameters of the command)



-
- | | | |
|-----|---|--|
| 13 | : | SIM failure (SIM response SW1 SW2 status byte Error) |
| 15 | : | SIM wrong (SIM response SW1 SW2 status byte Error) |
| 21 | : | invalid index (not correspond to an opened channel) |
| 100 | : | unknowns (generic error) |
-

- i** When the SW1 SW2 bytes received from UICC in response to **<command>** are “**61 XX**”, MT automatically send to UICC a GET RESPONSE command with length “**XX**” and the **+CGLA <response>** is that returned by GET RESPONSE command.

AT+CGLA=?

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



3.4.12. AT+ICCID - Read ICCID

Execution command reads on SIM the ICCID (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+ICCID

+ICCID: 89014104243627585306

OK



3.4.13. AT#SIMINCFG - SIMIN Pin Configuration

This command allows to set the SIMIN pin status for SIM detection.

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

AT#SIMINCFG=<GPIOPin>,<siminDetMode>

Set command sets SIMIN pin status for SIM detection.

Parameters:

Name	Type	Default	Description
<GPIOPin>	integer	-	number of the GPIO pin used as SIMIN pin. Actually, it is a dummy parameter that is not used.
<siminDetMode>	integer	0	status of SIMIN pin for SIM detection

Values:

- 0 : SIMIN pin LOW means SIM inserted, HIGH means SIM removed
- 1 : SIMIN pin LOW means SIM removed, HIGH means SIM inserted

AT#SIMINCFG?

Read command reports the selected SIMIN pin status in the format:

#SIMINCFG: 0,<siminDetMode>

AT#SIMINCFG=?

Test command reports supported range of values for parameters <GPIOPin> and <siminDetMode>.



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

3.5. SIM Toolkit

3.5.1. AT#STIA - SIM/USIM Toolkit Interface Action

The SIM/USIM Application Toolkit (SAT/USAT) provides an interface to the applications existing in the SIM/USIM device. The module must support the mechanisms required by the SIM/USIM applications.



[1] 3GPP TS 23.038

[2] 3GPP TS 31.111

[3] Telit SIM/USIM Application Toolkit Application Note

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



AT#STIA=[<mode>[,<timeout>]]

Set command is used to enable/disable the SIM/USIM Application Toolkit (SAT/USAT). In addition, the command can enable the URCs sending.

Parameters:

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

<mode>	integer	1	enables/disables SAT/USAT. In addition, <mode> parameter enables the:
--------	---------	---	--

#STN URCs notifying the user that the SIM/USIM application has issued a proactive command. Some proactive commands require a user response

#STN URCs that are the SIM/USIM device responses concerning actions initiated by the user, refer to Additional info section.



If **<mode>=2**, the URC format depends on the **<cmdType>** as described in the Additional info sections. For **<cmdType>**, and all other URC parameters refer to **#STGI** command. The **<mode>** parameter values are listed below.

Values:

- 0 : disable SAT/USAT
- 1 : enable SAT/USAT without #STN URC
- 2 : enable SAT/USAT and extended #STN URC
- 3 : enable SAT/USAT and reduced #STN URC
- 17 : enable SAT/USAT without #STN URC and the alphabet used
- 18 : enable SAT/USAT, extended #STN URC, and the alphabet used
- 19 : enable SAT/USAT, reduced #STN URC, and the alphabet used
- 33 : enable SAT/USAT without #STN URC and the UCS2 alphabet used
- 34 : enable SAT/USAT, extended #STN URC, and the UCS2 alphabet used
- 35 : enable SAT/USAT, reduced #STN URC, and the UCS2 alphabet used

<timeout>	integer	1	When an ongoing proactive command, requiring a user response, is not answered before <timeout> minutes, it is automatically aborted. In this case, the terminal response from the module is either "ME currently unable to process command" or, if applicable, "No response from user". In addition, the following URC is sent on the AT interface. For parameter meaning of the URC refer to Unsolicited fields section.
------------------------	---------	---	--



#STN:<cmdTerminateValue>

Follows the <timeout> range.

Value:

1,2 : timeout expressed in minutes

Additional info:

- ▶▶ <mode>=3, the URC has the following reduced format: **#STN:<cmdType>**

- ▶▶ <mode>=2, and <cmdType>=1 (REFRESH proactive command), the URC has the following extended format:
#STN: 1,<refreshType>

- ▶▶ <mode>=2, and <cmdType>=33 (DISPLAY TEXT proactive command), the URC is sent if allowed by SIM/USIM, the extended format is:
#STN: 33[,<cmdDetails>[,<alphaIdentifier>]]
If bit 7 of <cmdDetails>=1, the response with the **#STSR** command is required.

- ▶▶ <mode>=2, and <cmdType>=34 (GET INKEY proactive command), the URC has the following extended format:
#STN: 34,<cmdDetails>,<text>

- ▶▶ <mode>=2, and <cmdType>=35 (GET INPUT proactive command), the URC has the following extended format:
#STN: 35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

- ▶▶ **<mode>=2**, and **<cmdType>=36** (SELECT ITEM proactive command), the URC has the following extended format:
the first line of output is:
#STN: 36,<cmdDetails>,<numOfItem>[,<titleText>]<CR><LF>
one line follows for every item, repeated **<numOfItems>** times:
#STN: 36,<itemId>,<itemText>[,<nextActionId>]

- ▶▶ **<mode>=2**, and **<cmdType>=37** (SET UP MENU proactive command), the URC has the following extended format:
the first line of output is:
#STN: 37,<cmdDetails>,<numOfItem>,<titleText><CR><LF>
one line follows for every item, repeated for **<numOfItems>**:
#STN: 37,<itemId>,<itemText>[,<nextActionId>]

- ▶▶ **<mode>=2**, and **<cmdType>=40** (SET UP IDLE MODE TEXT proactive command), the URC has the following extended format:
#STN: 40[,<idleModeTextString>]

- i** The settings are saved on user profile and available on following reboot. SIM/USIM Toolkit activation/deactivation is only performed at power on according to the saved setting.
- i** A typical SAT/USAT session on AT interface starts after an **#STN: 37** unsolicited code is received, if enabled (see above). At that point usually an **AT#STGI=37** command is issued (see **#STGI**), and after the SAT main menu has been displayed on TE an **AT#STSR=37,0,x** command is issued to select an item in the menu (see **#STSR**).



AT#STIA?

Read command can be used to get information about the SAT/USAT interface. The message format is:

#STIA: <state>,<mode>,<timeout>,<SatProfile>

Additional info:

- ▶▶ Returned parameters.

Name	Type	Default	Description
<state>	integer	N/A	state of the sending of the SET UP MENU proactive command (37)
Values:			
0 : SIM/USIM has not sent the SET UP MENU proactive command (37)			
1 : SIM/USIM has sent the SET UP MENU proactive command (37)			
<mode>	integer	-	refer to Set section
<timeout>	integer	-	refer to Set section
<SatProfile>	string	-	SAT/USAT Terminal Profile. Is the list of SIM/USIM Application Toolkit facilities supported by the ME. The profile cannot be changed by the TA.

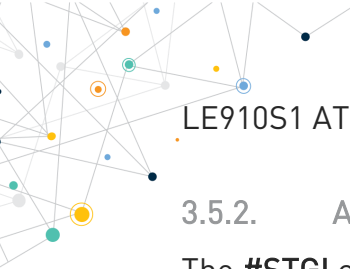
- i** In SAT/USAT applications an SMS message is usually sent to the network provider containing service requests, e.g. to send the latest news. The provider returns a message with the requested information. Before activating SAT/USAT, it is recommended to set the SMS text mode with the **AT+CMGF=1** command and enable URC for incoming SMS messages with **+CNMI** command.

AT#STIA=?

Test command returns the range of available values for the parameters **<mode>** and **<timeout>**.



⚠ ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.5.2. AT#STGI - SIM Toolkit Get Information

The **#STGI** command interfaces to the SIM/USIM Application Toolkit to get information on the ongoing proactive command.



3GPP TS 31.111
Telit SIM/USIM Application Toolkit Application Note

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



AT#STGI=[<cmdType>]

Set command gets parameters of the ongoing proactive command. The command can be used after the reception of the **#STN: <cmdType>** URC. If no proactive command is ongoing, **#STGI** returns an **ERROR** message.

Parameter:

Name	Type	Default	Description
<cmdType>	integer	N/A	proactive command code. For each proactive command listed below, its #STGI response format is described in the Additional info sections.

Values:

- 1 : REFRESH
- 33 : DISPLAY TEXT
- 34 : GET INKEY
- 35 : GET INPUT
- 36 : SELECT ITEM
- 37 : SET UP MENU
- 40 : SET UP IDLE MODE TEXT

Additional info:

▶▶ **<cmdType>=1** (REFRESH proactive command)

#STGI response format:

#STGI: 1,<refreshType>

Name	Type	Default	Description
<refreshType>	integer	N/A	identifies the refresh type

Values:

- 0 : SIM Initialization and Full File Change Notification
- 1 : File Change Notification
- 2 : SIM Initialization and File Change Notification
- 3 : SIM Initialization
- 4 : SIM Reset
- 5 : NAA Application Reset
- 6 : NAA Session Reset
- 7 : Steering of Roaming
- 8 : Steering of Roaming WLAN

▶▶ **<cmdType>=33** (DISPLAY TEXT proactive command)

#STGI response format:

#STGI: 33,<cmdDetails>[,<text>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning:



bit 0:
 0 - normal priority
 1 - high priority
bits 1-6:
 reserved for future use
bit 7:
 0 - clear message after a delay
 1 - wait for user to clear message

Value:

0x00÷0xFF : mask

<text>	string	-	text provided by the SIM/USIM device in ASCII format
---------------------	--------	---	--

►► **<cmdType>=34** (GET INKEY proactive command)

#STGI response format:

#STGI: 34,<cmdDetails>,<text>

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: bit 0: 0 - digits only (0-9, *, # and +) 1 - alphabet set bit 1: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet bit 2: 0 - character sets defined by bit 0 and bit 1 are enabled 1 - character sets defined by bit 0 and bit 1 are disabled and the "Yes/No" response is requested bits 3-6: 0

**bit 7:**

0 - no help information available

1 - help information available

Value:

0x00÷0x87 : mask

<text>	string	-	string as prompt for test
---------------------	--------	---	---------------------------

▶▶ **<cmdType>=35** (GET INPUT proactive command)

#STGI response format:

#STGI:

35,<cmdDetails>,<text>,<responseMin>,<responseMax>[,<defaultText>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	<p>a bit mask where each bit position, according to its value, has a specific meaning:</p> <p>bit 0: 0 - digits only (0-9, *, #, and +) 1 - alphabet set</p> <p>bit 1: 0 - SMS default alphabet (GSM character set) 1 - UCS2 alphabet</p> <p>bit 2: 0 - ME may echo user input on the display 1 - user input shall not be revealed in any way. Hidden entry mode is only available when using digit input. In hidden entry mode only characters ('0'-'9', '*' and '#') are allowed.</p> <p>bit 3: 0 - user input to be in unpacked format</p>



			1 - user input to be in SMS packed format
			bits 4-6: 0
			bit 7: 0 - no help information available 1 - help information available
	Value:		
		0x00÷0x8F	: mask
<text>	string	-	string as prompt for text
<responseMin>	integer	N/A	minimum number of characters of the user input
	Value:		
		0÷255	: minimum length of user input.
<responseMax>	integer	N/A	maximum number of characters of the user input.
	Value:		
		0÷255	: maximum length of user input
<defaultText>	string	-	string supplied as default response text

▶▶ **<cmdType>=36** (SELECT ITEM proactive command)

#STGI response format:

the first line of output is:

#STGI: 36,<cmdDetails>,<numOfItem>[,<titleText>]<CR><LF>

one line follows for every item, repeated **<numOfItems>** times:

#STGI: 36,<itemId>,<itemText>[,<nextActionId>]

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



<cmdDetails>	hex	N/A	<p>a bit mask where each bit position, according to its value, has a specific meaning:</p> <p>bit 0: 0 - presentation type is not specified 1 - presentation type is specified in bit 1</p> <p>bit 1: 0 - presentation as a choice of data values if bit 0 = 1 1 - presentation as a choice of navigation options if bit 0 is 1</p> <p>bit 2: 0 - no selection preference 1 - selection using soft key preferred</p> <p>bits 3-6: 0</p> <p>bit 7: 0 - no help information available 1 - help information available</p>
			<p>Value:</p> <p>0x00÷0x87 : mask</p>
<numOfItems>	integer	-	number of items in the list
<titleText>	string	-	menu title string
<itemId>	integer	N/A	item identifier
			<p>Value:</p> <p>1÷numOfItems : item identifier range</p>
<itemText>	string	-	item title string
<nextActionId>	integer	-	is the code of next proactive command to be issued upon execution of the menu item.

If **<nextActionId>**=0, no next action information available.

▶▶ **<cmdType>**=37 (SET UP MENU proactive command)

#STGI response format:

the first line of output is:

#STGI: 37,<cmdDetails>,<numOfItems>,<titleText><CR><LF>

one line follows for every item, repeated for **<numOfItems>**:

#STGI: 37,<itemId>,<itemText>[,<nextActionId>]

Name	Type	Default	Description
<cmdDetails>	hex	N/A	a bit mask where each bit position, according to its value, has a specific meaning: bit 0: 0 - no selection preference 1 - selection using soft key preferred bit 1-6: 0 bit 7: 0 - no help information available 1 - help information available
		Value:	
		0x00÷0x81	: mask
<numOfItems>	integer	-	number of items in the list
<titleText>	string	-	menu title string
<itemId>	integer	N/A	item identifier
		Value:	
		1÷numOfItems	: item identifier range
<itemText>	string	-	item title

<nextActionId> integer - numerical code of next proactive command type to be issued upon execution of the menu item.
If **<nextActionId>=0**, no next action information available.

- ▶▶ **<cmdType>=40** (SET UP IDLE MODE TEXT proactive command)
#STGI response format:
#STGI: 40,<idleModeTextString>

Name	Type	Default	Description
<idleModeTextString>	string	-	text provided by the SIM/USIM device in ASCII format

- i** The proactive commands are only those command types that use the AT interface. SAT/USAT commands which are not using the AT interface (not MMI related SAT commands, e.g. PROVIDE LOCAL INFORMATION) are executed without sending any indication to the user.

AT#STGI?

The read command returns the ongoing proactive command and the SAT/USAT state. The message format is:

#STGI: <state>,<cmdType>

Additional info:

- ▶▶ Returned parameters:

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

<state>	integer	-	state of the sending of the SET UP MENU proactive command (37), refer to AT#STIA? command
<cmdType>	integer	-	ongoing proactive command code

AT#STGI=?

Test command returns the supported values of parameters **<state>** and **<cmdType>**.



A typical SAT/USAT session, running on AT interface, starts when the user receives the **#STN: 37** URC. The unsolicited result code must be previously enabled by the **#STIA** command. The **#STN: 37** notifies the user that the main menu of the SIM/USIM Application has been sent to TA, and TA has stored the just received menu. Later, at any time, you can type in the **AT#STGI=37** command to display the main menu of the SIM/USIM Application on TE.

Upon receiving the **#STGI** response, you must enter the **#STSR** command to confirm the execution of the proactive command and provide any required user response. In this case, you must enter the **AT#STSR=37,0,x** command to select the **x** item of the SIM/USIM Application menu.

The **#STN: 237** URC indicates that the main menu of the SIM/USIM Application has been removed from TA, and it is no longer available. In this case, **AT#STGI=37** command returns **ERROR** message.



3.5.3. AT#STSR - SIM Toolkit Send Response

This command allows the user to provide a response to confirm the execution of the ongoing proactive command.



3GPP TS 31.111
Telit SIM/USIM Toolkit Application Note

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



AT#STSR=[<cmdType>[,<userAction>[,<data>]]]

The set command allows the user to provide a response action to the ongoing proactive command when the action is required by the command itself.

Parameters:

Name	Type	Default	Description
<cmdType>	integer	-	proactive command code, refer to #STGI command to have information on the <cmdType>
<userAction>	integer	0	identify the user action

Values:

- 0 : the user accepts the ongoing proactive command
- 16 : proactive SIM/USIM session terminated by user
- 17 : backward move in the proactive SIM/USIM session requested by the user
- 18 : no response from user
- 19 : help information required by the user

32 : TA currently unable to process command

<data>	string	-	data entered by user, see Additional info section
---------------------	--------	---	---

Additional info:

- ▶▶ **<data>** parameter is used according to **<cmdType>**, and when **<userAction>=0**:

- ▶▶ **<cmdType>=34** (GET INKEY proactive command)
<data> contains the key pressed by the user. The character set is selected by **+CSCS** command.

If the ongoing proactive command requires to the user a binary choice (yes/no), the valid content of **<data>** is:

- "Y" or "y" (positive answer) and "N" or "n" (negative answer) for "IRA", "8859-1", "PCCP437" character sets

- "0079" or "0059" (positive answer) and "006E" or "004E" (negative answer) for UCS2 alphabet

The ongoing proactive command to require a binary choice sets bit 2 of the **<cmdDetails>** parameter to 1, see **#STGI** command.

- ▶▶ **<cmdType>=35** (GET INPUT proactive command).
<data> contains the string of characters entered by the user.

- ▶▶ **<cmdType>=36** (SELECT ITEM proactive command).
<data> contains the item identifier selected by the user.

- i** Use of icons is not supported. All icon related actions will respond with no icon available.



AT#STSR?

The read command returns the ongoing proactive command and the SAT/USAT interface state. The format message is:

#STSR: <state>,<cmdType>

If there is no ongoing proactive command, an **ERROR** message is returned.

Additional info:

- ▶▶ Returned parameters.

Name	Type	Default	Description
<state>	integer	-	state of the sending of the SET UP MENU proactive command (37), refer to AT#STIA? command
<cmdType>	integer	-	proactive command code, refer to #STGI command to have information on the <cmdType>



AT#STSR=?

The test command returns the range for the parameters <state> and <cmdType>.

3.6. SMS & CB

3.6.1. 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 : The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2 version 4.7.0
- 1 : The syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2+ version

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>**



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

OK
```



3.6.2. AT+CPMS - Preferred Message Storage

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



3GPP TS 27.005

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



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

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

The command returns the memory storage status in the format:
+CPMS: <usedr>,<totalr>,<usedw>,<totalw>,<useds>,<totals>

The parameters are described in the Additional info section.

Parameters:

Name	Type	Default	Description
<memr>	string	SM	memory from which messages are read and deleted
Values:			
SM	:	SIM SMS memory storage	
ME	:	SMS memory storage in Flash	
SR	:	Status Report message storage (in SIM EF-SMSR file exists otherwise in the RAM volatile memory)	
<memw>	string	SM	memory to which writing and sending operations are made
Values:			

SM : SIM SMS memory storage

ME : SMS memory storage in Flash

<mems>	string	SM	memory to which received SMs are preferred to be stored
---------------------	--------	----	---

Values:

SM : SIM SMS memory storage

ME : SMS memory storage in Flash

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

- i** "SR" non volatile memory is cleared when another SIM card is inserted. It is kept, even after a reset, while the same SIM card is inserted.



AT+CPMS?

Read command reports the message storage status.

```
+CPMS:<memr>,<usedr>,<totalr>,<memw>,<usedw>,<totalw>,<mems>,<useds>,<totals>
```

The parameters are described in previous sections.

AT+CPMS=?

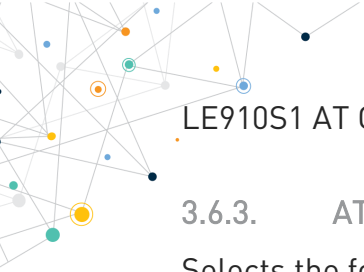
Test command reports the supported values for parameters **<memr>**, **<memw>** and **<mems>**.

AT+CPMS?

```
+CPMS: "ME",27, 50,"ME",27, 50,"SR",1,20  
OK
```

```
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 255 SMS SIM positions occupied)
```



3.6.3. AT+CMGF - Message Format

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



3GPP TS 27.005

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



AT+CMGF=[<mode>]

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

Parameter:

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

Values:

0 : PDU mode

1 : text mode



AT+CMGF?

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

+CMGF: <mode>



AT+CMGF=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

3.6.4. AT+CSCA - Service Center Address

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



3GPP TS 27.005

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



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

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

Parameters:

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



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

Values:

129 : National numbering scheme

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

- i** For Verizon FW, the range of <type> is 0 - 255.
- i** To use the SM service, is mandatory to set a Service Centre Address at which service requests directed

-  In Text mode the settings is used by send & 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 as default in SIM profile. Destination can be changed through **+CSAS**

**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.



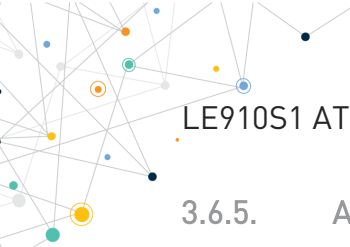
-  To use the SM service, is mandatory to set a Service Center Address at which service requests will be directed.
-  In Text mode, this setting is used by send and write commands; in PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into the **<pdu>** parameter equals zero.
-  The current settings are stored through **+CSAS**



```
AT+CSCA="821029190903",145
OK
```

```
AT+CSCA?
+CSCA: "+821029190903",145
OK
```





3.6.5. AT+CSMP - Set Text Mode Parameters

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



3GPP TS 27.005

3GPP TS 23.40

3GPP TS 23.038

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



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

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

Parameters:

Name	Type	Default	Description
<fo>	integer	17	<p>first octet - depending on the command or result code:</p> <p>first octet of 3GPP TS 23.040 SMS-SUBMIT or SMS-DELIVER, in integer format (default 17, i.e. SMS-SUBMIT with validity period in relative format). As first octet of a PDU has the following bit field description (bit[7]bit[6]bit[5]bit[4]bit[3]bit[2]bit[1]bit[0]):</p> <p>bit[1]bit[0]: Message Type Indicator, 2-bit field describing the message type; [00] - SMS-DELIVER; [01] - SMS-SUBMIT (default);</p> <p>bit[2]: Reject Duplicates, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);</p>



bit[4]bit[3]: Validity Period Format, 2-bit field indicating whether or not the Validity Period field is present (default is [10]):

[00] - Validity Period field not present

[01] - Validity Period field present in enhanced format (i.e. quoted time-string type, see below)

[10] - Validity Period field present in relative format, (i.e. integer type, see below)

[11] - Validity Period field present in absolute format (i.e. quoted time-string type, see below)

bit[5]: Status Report Request, 1-bit field indicating the MS is requesting a status report (default is [0]);

[0] - MS is not requesting a status report

[1] - MS is requesting a status report

bit[6]: User Data Header Indicator, 1-bit field: user is not responsible for setting this bit and, if any set, it will have no meaning (default is [0]);

bit[7]: Reply Path, 1-bit field indicating the request for Reply Path (default is [0]);

[0] - Reply Path not requested

[1] - Reply Path requested

Value:

0÷255 : mask

<vp>	mixed	167	validity period - depending on <fo> setting: a) if <fo> asks for a Not Present Validity Period, <vp> can be any type and it will be not considered; b) if <fo> asks for a Validity Period in relative format, <vp> shall be integer type (default 167, i.e. 24 hours); 0..143 - (<vp> + 1) x 5 minutes 144..167 - 12 hours + ((<vp> - 143) x 30 minutes)



168..196 - (<vp> - 166) x 1 day
197..255 - (<vp> - 192) x 1 week

c) if <fo> asks for a Validity Period in absolute format, <vp> shall be quoted time-string type (see +CCLK)

d) if <fo> asks for a Validity Period in enhanced format, <vp> shall be the quoted hexadecimal representation (string type) of 7 octets, as follows:

- the first octet is the Validity Period Functionality Indicator, indicating the way in which the other 6 octets are used; following bit field description:
 - bit[7]**: extension bit
 - [0] - there are no more VP Functionality Indicator extension octets to follow
 - bit[6]**: Single Shot SM;
 - [0] - the SC is not required to make up to one delivery attempt
 - [1] - the SC is required to make up to one delivery attempt
 - bit[5]bit[4]bit[3]**: reserved
 - [000]
 - bit[2]bit[1]bit[0]**: Validity Period Format
 - [000] - No Validity Period specified
 - [001] - Validity Period specified as for the relative format. The following octet contains the VP value as described before; all the other octets are 0s.
 - [010] - Validity Period is relative in integer representation. The following octet contains the VP value in the range 0 to 255, representing 0 to 255 seconds; all the other octets are 0s.
 - [011] - Validity Period is relative in semi-octet representation. The following 3 octets contain the relative time in Hours, Minutes and Seconds, giving the length of the validity period counted from when the SMS-SUBMIT is received by the SC; all the other octets are 0s.

Value:



0÷255 : range for Validity Period in relative format

<pid> integer 0 TP-Protocol-Identifier, as described in 3GPP TS 23.40

Value:

0÷255 : described in 3GPP TS 23.40

<dc> integer 0 SMS Data Coding Scheme, as described in 3GPP TS 23.038

Value:

0÷255 : described in 3GPP TS 23.038

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

AT+CSMP?

Read command returns the current setting in the format:

+CSMP: <fo>,<vp>,<pid>,<dc>

- If the Validity Period Format (<fo>'s **bit[4]bit[3]**) is [00] (i.e. Not Present), <vp> is represented just as a quoted empty string ("").

AT+CSMP=?

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



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

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

```
OK
```

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

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

```
OK
```

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 24 hours of validity period.

```
AT+CSMP=9,"01A80000000000"
```

```
OK
```

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 60 seconds of validity period.

```
AT+CSMP=9,"023C0000000000"
```

```
OK
```

Set the parameters for an outgoing message with validity period in enhanced format: the <vp> string actually codes 29 hours 85 minutes 30 seconds of validity period.

```
AT+CSMP=9,"03925803000000"
```

```
OK
```



3.6.6. AT+CSDH - Show Text Mode Parameters

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



3GPP TS 27.005

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



AT+CSDH=[<show>]

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

Parameter:

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

Values:

0 : 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>

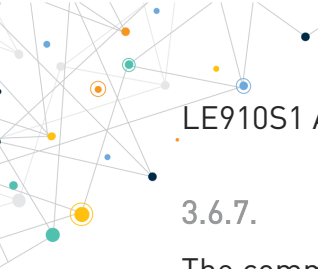


AT+CSDH=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.6.7. AT+CSCB - Select Cell Broadcast

The command selects which types of Cell Broadcast Messages are to be received by the device.



3GPP TS 27.005
3GPP TS 23.041
3GPP TS 23.038

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



AT+CSCB=[<mode>[,<mids>[,<dcss>]]]

Set command selects which types of Cell Broadcast Messages are to be received by the device

Parameters:

Name	Type	Default	Description
<mode>	integer	0	select which types of Cell Broadcast messages are to be received
Values:			
0 : the message types defined by <mids> and <dcss> are accepted			
1 : the message types defined by <mids> and <dcss> are rejected			
<mids>	string	-	message Identifiers: all different possible combinations of the CBM message identifiers;
<dcss>	string	-	Data Coding Schemes: all different possible combinations of CBM data coding schemes;

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


 **AT+CSCB?**

Read command reports the current value of parameters **<mode>**, **<mids>** and **<dcss>**

 **AT+CSCB=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

 **AT+CSCB?**

+CSCB: 1,"", ""

OK *(all CBMs are accepted, none is rejected, only in UMTS NW)*

AT+CSCB=0,"0,1,300-315,450", "0-3"

OK

3.6.8. AT+CSAS - Save Settings

This command saves settings which have been made by the **+CSCA**, **+CSMP** and **+CSCB** commands in local non volatile memory



- 3GPP TS 27.005

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



AT+CSAS[=<profile>]

Execution command saves settings which have been made by the **+CSCA**, **+CSMP** and **+CSCB** commands in local non volatile memory

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 and its max is 3

- 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 the settings are saved in the non volatile memory.



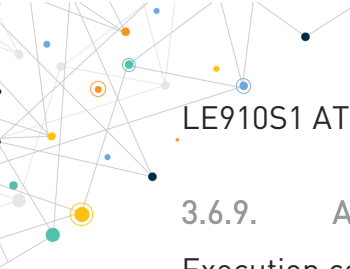
AT+CSAS=?



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



LE910S1 allows to store up to 5 profiles.



3.6.9. AT+CRES - Restore Settings

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



3GPP TS 27.005

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



AT+CRES=[<profile>]

Parameter:

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

Values:

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


- 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?

Read command reports the current value of the parameter <profile>.

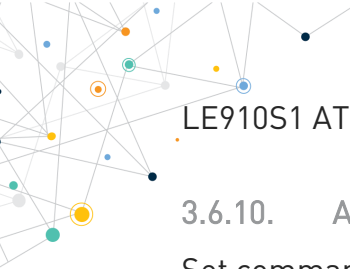


 **AT+CRES=?**

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



LE910S1 allows to store up to 5 profiles,



3.6.10. AT+CMMS - More Message to Send

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



3GPP TS 27.005

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



AT+CMMS=[<n>]

Parameter:

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

Values:

- 0 : disable
- 1 : keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed and the parameter <n> is automatically reset to 0
- 2 : keep link opened while messages are sent. If the delay between two messages exceeds 3 seconds, the link is closed but the parameter <n> remains set to 2



AT+CMMS?

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



AT+CMMS=?



Test command reports the supported value of <n> parameter.



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

This command sets the parameters for receiving SMS messages.



3GPP TS 27.005

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



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

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

Parameters:

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

Values:

- 0 : Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
- 1 : Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved, otherwise forward them directly to the TE.
- 2 : Buffer unsolicited result codes in the TA in case the DTE is busy and flush them to the TE after reservation. Otherwise forward them directly to the TE.
- 3 : if <mt> is set to 1, it enables the hardware ring line for 1 sec. Not supported

<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: <memr>,<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
<memr>	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 <dcS> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set (bit 6 of <fo> is 0), each character of GSM alphabet will be converted into current TE character set (see +CSCS).
		If <dcS> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set (bit 6 of <fo> is 1), each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41).
		Class 2 messages and messages in the "store" message waiting indication group result in indication as defined in <mt>=1 .
<sn>	integer	message serial number
<mid>	integer	message ID
<dcS>	string	Data Coding Scheme
<pag>	integer	page number
<pages>	integer	total number of pages of the message
<data>	string	CBM Content of Message If <dcS> indicates that GSM 03.38 default alphabet is used, each character of GSM alphabet will be converted into current TE character set (see +CSCS)
		If <dcS> indicates that 8-bit or UCS2 data coding scheme is used, each 8-bit octet will be converted into two IRA character long hexadecimal number (e.g. octet 0x2A will be converted as two characters 0x32 0x41)
<mr>	integer	message reference number; 3GPP TS 23.040 TP-Message-Reference in integer format
<ra>	string	recipient address, string type, represented in the currently selected character set (see +CSCS)

<tora>	integer	type of number <ra> : 129 - number in national format 145 - number in international format (contains the "+")
<scts>	string	arrival time of the message to the SC
<dt>	string	sending time of the message
<st>	string	message status as coded in the PDU

-  DTR signal is ignored, hence the indication is sent even if the DTE is inactive (DTR signal is Low). In this case the unsolicited result code may be lost so if MODULE remains active while DTE is not, at DTE startup is suggested to check whether new messages have reached the device meanwhile with command **AT+CMGL=0** that lists the new messages received.
-  For Verizon FW, the range of **<tooa>**, **<tosca>** is 0 - 255.

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



Concatenated SMS is not supported in text mode

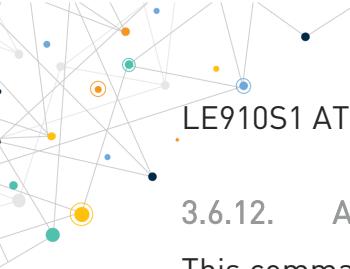
It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.

-  **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



```
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
```



3.6.12. 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=<n>

Parameter:

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

<n>	integer	N/A	type of acknowledgement in PDU mode
-----	---------	-----	-------------------------------------

Values:

0 : send RP-ACK without PDU

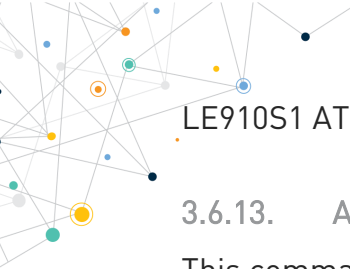
1 : send RP-ACK with optional PDU message

2 : send RP-ERROR with optional PDU message



AT+CNMA=?

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



3.6.13. AT+CMGL - List Messages

This command is used to list the messages.



3GPP TS 27.005

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** For Verizon FW, the range of <tooa>, <toda> is 0 - 255

? AT+CMGL=?

Test command returns a list of supported <stat>s



Concatenated SMS is not supported in text mode

It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.



AT+CMGF=1 *Set Text mode*

OK

AT+CMGL

+CMGL: 1,"REC UNREAD","+821020955219",,"07/07/26,20:05:11+36"

SMS Test message

+CMGL: 2,"REC UNREAD","+821020955219",,"07/07/26,20:05:58+36"

SMS Test message

+CMGL: 3,"REC UNREAD","+821020955219",,"07/07/26,20:06:37+36"

SMS Test Message.

+CMGL: 4,"REC UNREAD","+821020955219",,"07/07/26,20:07:43+36"

TEST MESSAGE..

+CMGL: 5,"REC UNREAD","+821020955219",,"07/07/26,20:09:07+36"

TEST MESSAGE

OK

AT+CMGF=0 *Set PDU mode*

OK

AT+CMGL=2

+CMGL: 0,2,,24

079128019291903011640A8110567892820000A70CF4F29C0E6A97E7F3F0B90C

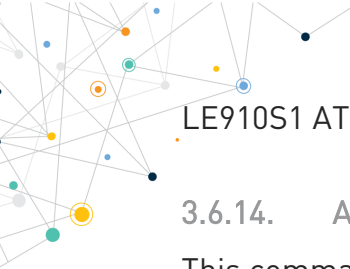
+CMGL: 1,2,,21

079128019291903011640A8110516529700000A709027A794E77B95C2E

+CMGL: 26,2,,17

08812801009901025911640A8110567892820014A704C7D1B1DB

OK



3.6.14. AT+CMGR - Read Message

This command is used to read a message.



3GPP TS 27.005

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
<dc>	integer	-	Data Coding Scheme
<vp>	mixed	-	Validity Period; its format depends on SMS-SUBMIT <fo> setting (see +CPMS): <ol style="list-style-type: none"> 1. Not present: if <fo> tells that Validity Period Format is not present 2. Integer: if <fo> tells that Validity Period Format is relative 3. Quoted time-string type: if <fo> tells that Validity Period Format is absolute



			4.	Quoted hexadecimal representation of 7 octets: if <fo> tells that Validity Period Format is enhanced
--	--	--	----	---

<oa>	string	-		Originator address, represented in the currently selected character set (see +CSCS).
-------------------	--------	---	--	--

<da>	string	-		Destination address, represented in the currently selected character set (see +CSCS).
-------------------	--------	---	--	---

<alpha>	string	-		The alphanumeric representation of <da> or <oa> , corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS .
----------------------	--------	---	--	--

<sca>	string	-		Service Centre Address
--------------------	--------	---	--	------------------------

<toa>	integer	N/A		type of number of <oa>
	Values:			
	129	:		number in national format
	145	:		number in international format (contains the "+")

<tda>	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	-	<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 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>

- 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'.
- i For Verizon FW, the range of **<tooa>**, **<toda >**, **<tosca>** is 0 - 255

AT+CMGR=?

Test command returns the **OK** result code



Concatenated SMS is not supported in text mode

It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.



```
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
```



3.6.15. AT+CMGS - Send Short Message

The command is related to sending short messages.



3GPP TS 27.005

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

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

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

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

Values:





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 PDU is given. The echoing of given characters back from the TA 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 PDU.

-  To ensure that during the command execution, which may take several seconds, no other SIM interacting commands issued, care must take.
-  It is possible to send a concatenation of at most 16 SMS; the maximum number of chars depends on the **<dc>**:
2432 chars
2128 chars if 8-bit is used
1056 chars if 16-bit is used
-  If message sending fails for some reason, then an error code is reported.
-  For Verizon FW, the range of **<tda>** is 0 - 255

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.



Concatenated SMS is not supported in text mode

It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.



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

3.6.16. 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>[, <scts>]




where:

<mr> - message reference number.

<scts> - TP-Service Centre Time Stamp in Time String Format.


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.
-  For Verizon FW, the range of **<toda>** for 3GPP format SMS is 0 - 255

AT+CMSS=?

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

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



Concatenated SMS is not supported in text mode

It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.



```
AT+CMGF=1
OK
AT+CMGW="0165872928"
> test message...
+CMGW: 28

OK
AT+CMSS=28
+CMSS: 136

OK
```



3.6.17. AT+CMGW - Write Short Message to Memory

The command is related to writing short messages.



3GPP TS 27.005

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	2	message status
	Values:		
	0	:	new message
	1	:	read message
	2	:	stored message not sent yet
	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>[,<tda>[,<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	"STO UNSENT"	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 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 16 SMS; the maximum number of chars depends on <dcs>:

2432 chars

2128 chars if 8-bit is used

1056 chars if 16-bit 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".

- i If message writing fails for some reason, then an error code is reported.
- i For Verizon FW, the range of <tda> is 0 - 255

 **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.



Concatenated SMS is not supported in text mode

It is the application responsibility to decode the HEX format of the Concatenated SMS and assemble the pieces into text.



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

OK





3.6.18. 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 from memory <memr> the message(s).

Parameters:

Name	Type	Default	Description
<index>	integer	-	message index in the selected storage <memr>
<delflag>	integer	0	Type of multiple message deletion

Values:

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



4 : Delete all messages from <memr> storage

- i** if <delflag> is present and not set to 0 then <index> is ignored and ME shall follow the rules for <delflag> shown above.
 - i** In case of Verizon, delete an empty slot with specified <index> will return **ERROR**
-

? AT+CMGD=?

Test command shows the valid memory locations <index> and the supported values of <delflag>.

+CMGD: (supported <index>s list)[,(supported <delflag>s list)]

</>AT+CMGD=?

+CMGD:

{0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50},{0-4}

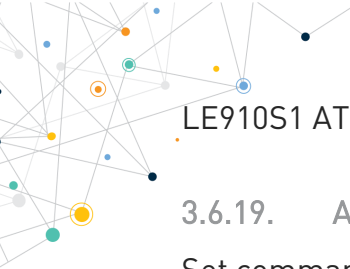
OK

AT+CMGD=11 *Delete message in 10th record*

OK

AT+CMGD=1,4 *Delete all messages*

OK



3.6.19. 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 If SMS transfer via Packet Domain fails, <service> parameter automatically reset to Circuit switched.



AT+CGSMS?



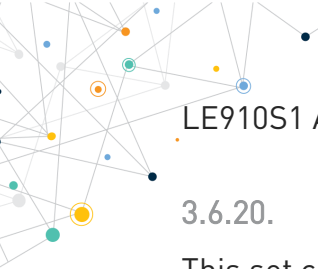
The read command returns the currently selected service or service preference in the format:

+CGSMS: <service>



AT+CGSMS=?

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



3.6.20. AT#E2SMSRI - SMS Ring Indicator

This set command enables/disables the Ring Indicator pin response to an incoming SMS message. If enabled, a negative going pulse is generated when receiving an incoming SMS message.

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



AT#E2SMSRI=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	0	RI enabling

Values:


- 0 : disables RI pin response for incoming SMS messages
- 50÷1150 : enables RI pin response for incoming SMS. The value of <n> is the duration in ms of the pulse generated on receipt of an incoming SMS.

-  If **+CNMI=3,1** command is issued, and the module is in a GPRS connection, a 100 ms break signal is sent and a 1 sec. pulse is generated on RI pin, no matter if the RI pin response is either enabled or not.
-  If **+CNMI=0,0,0,0,0** command is issued, no ring pulse will be generated, regardless of **#E2SMSRI** value

AT#E2SMSRI?

Read command reports the duration in ms of the pulse generated on receipt of an SMS, in the format:


#E2SMSRI: <n>

-  <n>=0 means that the RI pin response to an incoming SMS is disabled

AT#E2SMSRI=?

Reports the range of supported values for parameter <n>



-  ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.7. Phonebook

3.7.1. 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>

Parameter:

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). Not supported.
- "MC" : device missed (unanswered received) calls list (+CPBF is not applicable for this storage). Not supported.
- "RC" : ME received calls list (+CPBF is not applicable for this storage). Not supported.

"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). Not supported.
"DC"	: ME last-dialing-phonebook (+CPBF is not applicable for this storage). Not supported.
"ME"	: ME phonebook. Not supported.
"EN"	: SIM emergency numbers phonebook (+CPBW and +CPBF not applicable for this storage). Not supported.
"ON"	: SIM own numbers (MSISDNs) phonebook (+CPBF is not applicable for this storage)
"SDN"	: SIM Service Dialing Numbers (SDN) phonebook (+CPBW is not applicable for this storage)
"AP"	: SIM application phonebook (DFPHONEBOOK under ADFUSIM)
"MN"	: SIM card CPHS MN
"MBDN"	: SIM card CPHS MBDN



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>



AT+CPBS=?

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



 ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



Current phonebook storage is SIM

```
AT+CPBS="SM"
```

```
OK
```

```
AT+CPBR=1
```

```
+CPBR: 1,"0105872928",129,"James"
```

```
OK
```



3.7.2. 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>]]]
```

or

```
+CME ERROR: <err>
```

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

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



- i** Remember to select the PB storage with **+CPBS** command before issuing PB commands.



```
AT+CPBS="ME"  
OK  
AT+CPBS?  
+CPBS: "ME",1,100  
OK  
AT+CPBR=?  
+CPBR: (1-500),40,20,2,20,20 OK  
AT+CPBR=1  
+CPBR: 1,"01048771234",129,"James", "", "",0, "", ""  
  
OK
```

3.7.3. 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" or "DC".
- 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



i Remember to select the PB storage with **+CPBS** command before issuing PB commands.



AT+CPBS="ME"

Selecting phonebook

OK

AT+CPBF="J"

Searching for string "J"

+CPBF: 1,"01048771234",129,"James",",",",",0,",",",",

+CPBF: 2,"0169998888",129,"Jane",",",",",0,",",",", **OK**

Searching for everything in phone book, and finding all entries

AT+CPBF=""

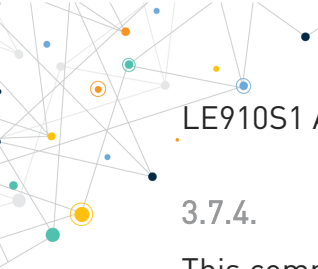
+CPBF: 1,"01048771234",129,"James",",",",",0,",",",",

+CPBF: 2,"0169998888",129,"Jane",",",",",0,",",",",

+CPBF: 7,"0115556666",129,"Juliet",",",",",0,",",",",

+CPBF: 5,"0181111234",129,"Kevin",",",",",0,",",",",

OK



3.7.4. 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>]]]]

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

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>**.
- i** If either **<number>**, **<type>** and **<text>** omitted, the phonebook entry in location **<index>** deleted.
- i** If **<index>** is omitted or **<index>=0**, the number **<number>** is stored in the first free phonebook location.

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>**

Additional info:

- ▶▶ Test command response fields

Name	Type	Default	Description
<nlength>	integer	-	Maximum length of field <number>
<tlength>	integer	-	Maximum length of field <text>

- 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.



```
AT+CPBW=?  
+CPBW: (1-500),40,(129,145),255  
OK  
AT+CPBW=6,"18651896699",129,"John"  
OK
```


3.8. Time & Alarm

3.8.1. 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



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"
```

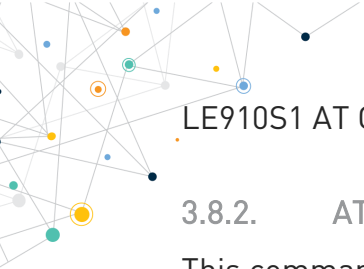
```
OK
```

Read date and time:

```
AT+CCLK?
```

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

```
OK
```



3.8.2. 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:




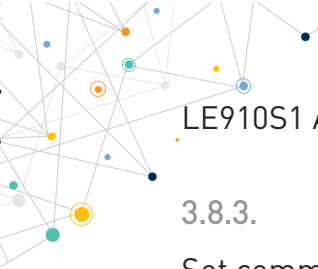
+CTZR: <onoff>

 **AT+CTZR=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.8.3. AT+CTZU - Automatic Time Zone Update

Set command enables/disables the automatic time zone update via NITZ.



3GPP TS 27.007

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



AT+CTZU=<onoff>

Parameter:

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

<onoff>	integer	0	enables/disables the automatic time zone update
---------	---------	---	---

Values:

0 : disable

1 : enable

i Despite of the name, the command **+CTZU** enables automatic update of the date and time set by **+CCLK** command (not only time zone).



AT+CTZU?

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

+CTZU: <onoff>



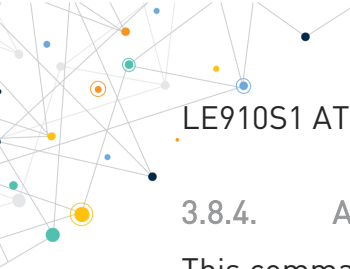
AT+CTZU=?



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



⚠ **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.8.4. AT#NITZ - Network Identity and Time Zone

This command handles Network Identity and Time Zone.

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

AT#NITZ=[<val>[,<mode>]]

Set command enables/disables the automatic date/time updating and the Full Network Name applying. It enables also the #NITZ URC in the format:

#NITZ: <datetime>

and permits to change its format.

Parameters:

Name	Type	Default	Description
<val>	integer	7	identifies the functionalities to enable. The <val> parameter is a sum of integer values, where every value corresponds to a functionality: 1 - enables automatic date/time updating 2 - enables Full Network Name applying 4 - sets the #NITZ URC 'extended' format (see <datetime> below) 8 - sets the #NITZ URC 'extended' format with Daylight Saving Time (DST) support (see <datetime> below)

Values:

- 0 : disables every functionality
- 1÷15 : sum of integer values

<mode>	integer	0	enables/disables the #NITZ URC
--------	---------	---	--------------------------------

Values:

0 : disables the URC

1 : enables the URC

Unsolicited field:

Name	Type	Description
<datetime>	string	string format depends on parameter <val> "yy/MM/dd,hh:mm:ss" - 'basic' format, if <val> is in (0..3) "yy/MM/dd,hh:mm:ss±zz" - 'extended' format, if <val> is in (4..7) "yy/MM/dd,hh:mm:ss±zz,d" - 'extended' format with DST support, if <val> is in (8..15) For the meaning of the <datetime> subfields, please check +CCLK and #CCLK commands

- i** If the DST information is not sent by the network, then the <datetime> parameter will have the format "yy/MM/dd,hh:mm:ss±zz".
- i** Date and time information can be sent by the network after GSM registration or after PS attach.



AT#NITZ?

Read command reports whether

- automatic date/time updating
- Full Network Name applying
- #NITZ URC (as well as its format)

are currently enabled or not in the format:


#NITZ: <val>,<mode>

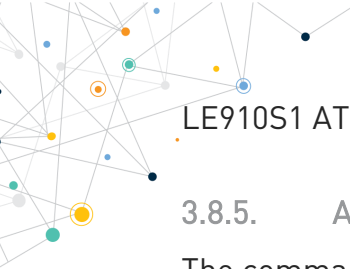


 **AT#NITZ=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.8.5. 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,d"

Values:

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

-
- `±zz` : time zone (indicates the difference, expressed in quarter of an hour, between the local time and GMT; two digits are mandatory), range is: -96..+96
 - `d` : number of hours added to the local TZ because of Daylight Saving Time (summertime) adjustment; range is 0-2.
-



AT#CCLK?

Read command returns the current setting of the real-time clock, in the format `<time>`.

- i** If the time is set by the network but the Daylight-Saving Time (DST) information is missing, or the time is set by `+CCLK` command, then the `<time>` format is:

`"yy/MM/dd,hh:mm:ss±zz"`



AT#CCLK=?

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



The way of writing the `<time>`:

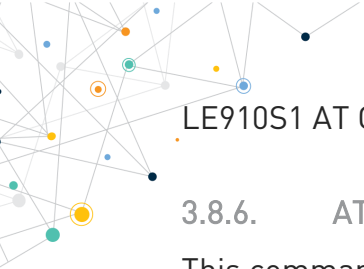
`"yy/mm/dd,hh:mm:ss±zz,d"`

`AT#CCLK="02/09/07,22:30:00+00,1"`



- Set command:
`AT#CCLK="14/02/18,08:00:00+12,1"`
OK

- Read command:
`AT#CCLK?`
`#CCLK: "14/02/18,08:00:02+12,1"`
OK



3.8.6. AT#CCLKMODE - Clock Mode

This command allows to enable the local time or the UTC time.

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

AT#CCLKMODE=<mode>


Set command enables the local time or the UTC time in +CCLK and #CCLK commands

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Time and date mode

Values:

- 0 : Local time + local time zone offset
- 1 : UTC time + local time zone offset

 The setting is saved automatically in NVM.

AT#CCLKMODE?

Read command reports whether the local time or the UTC time is enabled, in the format:

#CCLKMODE: <mode>

AT#CCLKMODE=?

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



3.9. Audio

3.9.1. Audio Basic Configuration

3.9.1.1. AT+CLVL - Loudspeaker Volume Level

This command allows to set the volume of internal loudspeaker audio output.



3GPP TS 27.007

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



AT+CLVL=<level>

Set command is used to select the volume of the internal loudspeaker audio output of the device.

Parameter:

Name	Type	Default	Description
<level>	integer	12	Loudspeaker volume (+2dB/step)

Value:

0÷max : max value can be read by issuing the Test command.



AT+CLVL?

Read command reports the current <level> setting of the loudspeaker volume in the format:


+CLVL: <level>

 **AT+CLVL=?**

Test command returns the supported values of parameter **<level>** in the format:

+CLVL: (0-max)



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.9.1.2. AT+CMUT - Microphone Mute Control

This command enables/disables the muting of the microphone audio line during a voice call.



- 3GPP TS 27.007

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



AT+CMUT=<n>

Set command enables/disables the uplink voice muting during a voice call.

Parameter:

Name	Type	Default	Description
<n>	integer	0	Controls the muting of the microphone audio line

Values:

0 : mute off, microphone active

1 : mute on, microphone muted

- i** This command mutes/activates both microphone audio paths, internal mic and external mic.




AT+CMUT?

Read command reports whether the muting of the microphone audio line during a voice call is enabled or not, in the format:


+CMUT:<n>



 **AT+CMUT=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.9.1.3. AT#CAP - Change Audio Path

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

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



AT#CAP=[<n>]

Parameter:

Name	Type	Default	Description
<n>	integer	1	change physical audio path

Values:

- 0 : Not supported
- 1 : Handsfree MIC1 – SPKR1 SPKR2 (automatic DSP profile 1 Hands Free)
- 2 : Headset – MIC2 – SPKR1 SPKR2 (automatic DSP profile 2 Headset)

-  The audio path is mutually exclusive, enabling one disables the other.
-  When changing the audio path, the volume level is set at the previously stored value for that audio path (see **+CLVL**).

AT#CAP?


Read command reports the set value of the parameter <n> in the format:
#CAP: <n>



 **AT#CAP=?**

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



 **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "No"

3.10. HW and Radio Control

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

Set the value of 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 sets the value of 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	N/A	sets GPIO pin configuration, its action depends on <dir> value. Refer to Additional info sections.
Value:			
0÷4 : mode identifier			
<dir>	integer	N/A	sets the GPIO pin in input, output, or alternate functions. If <dir> = 2,3,4,5,6,7,8,9,10,11,12, 13, 14, 17, 18, 19 pin direction is Alternate Function ALT1, ALT2, ALT3, ALT4, ALT5, ALT6, ALT7, ALT8, ALT9, ALT10, ALT11, ALT12, ALT13, ALT15,



ALT16, ATL17, ALT18 respectively this direction.

ALT6, ALT11, ALT12, ALT13, ALT15, ALT18 cannot be set via **#GPIO**

Values:

0 : pin set as input

1 : pin set as output

2÷19 : 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 or reset ALTx function on <dir> parameter.
---------------------	---------	---	---

Values:

0 : GPIO pin configuration is not saved

1 : GPIO pin configuration is saved

Additional info:

►► meaning of **<mode>**

0 - remove any Pull-up/Pull-down if **<dir>=0** - INPUT
- output pin cleared to 0 (Low) if **<dir>=1** - OUTPUT

1 - remove any Pull-up/Pull-down if **<dir>=0** - INPUT
- output pin set to 1 (High) if **<dir>=1** - OUTPUT

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

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

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







- ▶▶ While GPIO<pin> is used by ALT function, it cannot be set as GPIO output or any other ALT function before the original ALT is released or change it to GPIO input (default state).

Name	Type	Default	Description
<dir>	integer	-	current direction setting for the GPIO<pin>
<stat>	integer	-	the parameter can be: logic value read from pin GPIO<pin> in the case the pin <dir> is set to input; logic value present in output of the pin GPIO<pin> in the case the pin <dir> is currently set to output; No meaning value for the pin GPIO<pin> in the case the pin <dir> is set to alternate function or Tristate pull down.

- ▶▶ ALT6 is available for all GPIOs and this value is only possible to set by **#FASTSHDN**
ALT15 is available for all GPIOs and this value is only possible to set by **#DGEN**
- ▶▶ "ALT1" value is valid for GPIO1 as "SLED"
"ALT2" value is valid for all GPIOs: alternate function is "Alarm Pin"
"ALT3" value is valid for all GPIOs as "TempMon Pin"
"ALT4" value is valid for all GPIOs as "AD_Det Pin"
"ALT5" value is valid for all GPIOs as "AD_Rep Pin"
"ALT6" value is valid for all GPIOs as "FASTSHDN"
"ALT7" value is valid for GPIO4 as "WKIO"

"ALT8" value is valid for ALL "FRATTRIGGER" "ALT9" value is valid for ALL "HSGC"
"ALT10" value is valid for GPIO8 as "SWREADYEN"
"ALT11" value is valid for ALL GPIOs as "I2C commands"
"ALT12" value is valid for GPIO8 as "W_DISABLE of PSMWDISACFG"
"ALT13" value is valid for GPIO10 as "VBUS control of PSMWDISACFG"
"ALT14" reserved
"ALT15" value is valid for all GPIOs as "Dying GASP"
"ALT16" value is valid for all GPIOs as "Antenna Control 0"
"ALT17" value is valid for all GPIOs as "Antenna Control 1"
"ALT18" value is valid for all GPIOs as "Kernel GPIO Driver"

-  Not all configurations for the three parameters are valid.
-  While using the pins in the alternate function, the GPIO read/write access to that pin is not accessible and must be avoided.
-  **SLED** & **SWREADYEN** will work depending on HW version.
-  To activate **SLED** by default, **#SLED** command should be set to `<mode>=2` after setting ALT1 as follows. (See **#SLED**,**#SLEDSAV** command)

```
AT#GPIO=1,0,2 OK
AT#SLED=2
OK
AT#SLEDSAV
OK
```



AT#GPIO?

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

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

where:

<dir> - as seen before

<stat> - as seen before

If <mode> = 3,4 the output format is

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

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

AT#GPIO=?

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



```
AT#GPIO=?
```

```
#GPIO: (1-10),(0-4),(0-14,16-18),(0,1)
```

```
OK
```

```
AT#GPIO=3,1,1 // setting GPIO3 as output and value is HIGH
```

```
OK
```

```
AT#GPIO=4,1,1,1 // setting GPIO4 as output and value is HIGH and GPIO pin  
save configuration
```

```
OK
```

```
AT#GPIO=3,2 // report GPIO3 state
```

```
#GPIO: 1,1
```

```
OK
```

```
AT#GPIO? // read command
```

```
#GPIO: 1,1 // GPIO1 is output and output value is HIGH
```

```
#GPIO: 0,0
```

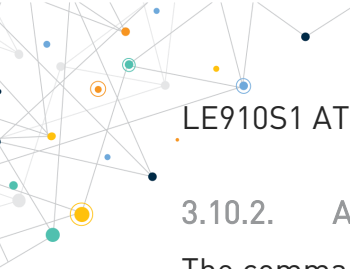
```
#GPIO: 1,1
```

```
#GPIO: 0,0
```

```
#GPIO: 0,1 // GPIO5 is input and input value is HIGH
```

```
#GPIO: 1,0
```

```
OK
```



3.10.2. AT#SLED - STAT_LED GPIO Setting

The command configures the behavior of the STAT_LED GPIO.

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

AT#SLED=<mode>[,<onDuration>[,<offDuration>]]

Set command sets the behaviour of the STAT_LED GPIO.

Parameters:

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

<mode>	integer	2	defines the STAT_LED GPIO behavior.
--------	---------	---	-------------------------------------

Values:

- 0 : GPIO tied low
- 1 : GPIO tied high
- 2 : GPIO is handled with specific timings. See Additional info section
- 3 : GPIO is turned ON/OFF alternatively, with period defined by the sum <onDuration> + <offDuration>
- 4 : GPIO is handled with specific timings. See Additional info section
- 5 : status led disabled

<onDuration>	integer	10	duration of period in which STAT_LED GPIO is tied high while <mode>=3
--------------	---------	----	---

Value:

- 1÷100 : in tenth of seconds



<offDuration>	integer	10	duration of period in which STAT_LED GPIO is tied low while <mode>=3
----------------------------	---------	----	---

Value:

1÷100 : in tenth of seconds

Additional info:

- ▶▶ **<mode>=2**, the timings of STAT_LED GPIO are:
not registered: always ON

registered in idle: blinking 1 s ON and 2 s OFF

registered in idle with power saving: blinking time depends on network condition to minimize power consumption

- ▶▶ **<mode>=4**, the timings of STAT_LED GPIO are:
not registered: blinking 0,5 s ON and 0,5 s OFF

registered in idle: blinking 300 ms ON and 2,7 s OFF

registered in idle with power saving: blinking time depends on network condition to minimize power consumption

- i** When module boot the STAT_LED GPIO always tied High and holds this value until the first NVM reading.
- i** SLED function of a GPIO corresponds to ALT1 function of the GPIO, So ALT1 function should be set through **AT#GPIO** command.



AT#SLED?

Read command returns the STAT_LED GPIO current setting, in the format:



#SLED: <mode>,<onDuration>,<offDuration>

 **AT#SLED=?**

Test command returns the range of available values for parameters **<mode>**, **<onDuration>** and **<offDuration>**.



The setting is saved using the **#SLEDSAV** command.



3.10.3. AT#SLEDSAV - Save STAT_LED GPIO Setting

This command allows to save the current **STAT_LED** GPIO setting.

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



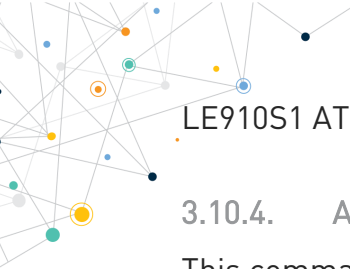
AT#SLEDSAV

Execution command saves the **STAT_LED** GPIO setting in NVM.



AT#SLEDSAV=?

Test command returns **OK** result code.



3.10.4. AT#ADC - Read Analog/Digital Converter Input

This command returns the current voltage value of the specified ADC inputs, expressed in mV.

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



AT#ADC=[<adc>,<mode>[,<dir>]]

Execution command reads selected <adc> pin voltage, converted by ADC, and prints out the result as shown in Additional info section.

Parameters:

Name	Type	Default	Description
<adc>	integer	N/A	index of input pin
Values:			
1 : available			
2 : available			
<mode>	integer	2	required action
Value:			
2 : query ADC value			
<dir>	integer	0	direction. Its interpretation is currently not implemented.
Value:			
0 : no effect			

Additional info:

- Format of the message printed out by the execution command:
#ADC:<value>

Name	Type	Default	Description
<adc>	integer	-	pin <adc> voltage expressed in mV.

- i** The command returns the last valid measure.

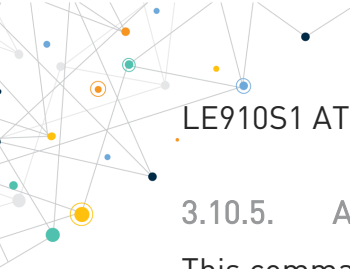
AT#ADC?

Read command reports all pins voltage, converted by ADC, in the format:

#ADC: <value>[<CR><LF>#ADC: <value>[...]]

AT#ADC=?

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



3.10.5. AT#V24CFG - V24 Output Pins Configuration

This command sets the AT commands serial port interface output pins mode.

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

AT#V24CFG=<pin>,<mode>[,<save>]

Set command sets the AT commands serial port interface output pins mode.

Parameters:

Name	Type	Default	Description
<pin>	integer	N/A	AT commands serial port interface hardware pin

Values:

- 0 : DCD (Data Carrier Detect)
- 1 : Not supported. CTS (Clear To Send)
- 2 : RI (Ring Indicator)
- 3 : DSR (Data Set Ready)
- 4 : Not supported. DTR (Data Terminal Ready). This is not an output pin, so its state cannot be set through the AT#V24 command
- 5 : Not supported. RTS (Request To Send). This is not an output pin, so its state cannot be set through the AT#V24 command
- 6 : Not supported. RXD (Receive Data). This is not an output pin, so its state cannot be set through the AT#V24 command
- 7 : Not supported. TXD (Transmit Data)



<mode>	integer	0	AT commands serial port interface hardware pins mode
---------------------	---------	---	--

Values:

- 0 : AT commands serial port mode: the V24 pins are controlled by the serial port device driver
- 1 : GPIO mode: the V24 output pins can be managed through the AT#V24 command

<save>	integer	1	Save V24 pin configuration
---------------------	---------	---	----------------------------

Values:

- 0 : Not supported. Pin configuration is not saved
 - 1 : Pin configuration is saved
-

- i** If optional **<save>** parameter is omitted, the pin configuration will be stored in NVM (default **<save>** parameter is 1).
If optional **<save>** parameter is present, it must be 1 (only supported **<save>** parameter is 1) and the pin configuration will be stored in NVM.
- i** **AT#V24CFG** pin configuration takes effect only after reboot.
- i** Changing V24 pins configuration may affect the cellular module functionality set through **+CFUN**.



AT#V24CFG?

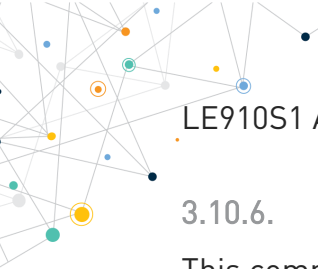
Read command returns the current configuration for all the pins (both output and input) in the format:

```
#V24CFG: <pin1>,<mode1>[<CR><LF><CR><LF>
#V24CFG: <pin2>,<mode2>[...]]
```



 **AT#V24CFG=?**

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



3.10.6. AT#V24 - V24 Output Pins Control

This command sets the state of the output pins of the AT commands serial port interface.

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



AT#V24=<pin>[,<state>]

Set command sets the AT commands serial port interface output pins state, when pins are in GPIO mode (see #V24CFG).

Parameters:

Name	Type	Default	Description
<pin>	integer	N/A	AT commands serial port interface hardware pin:

Values:

- 0 : DCD (Data Carrier Detect)
- 1 : Not supported. CTS (Clear To Send)
- 2 : RI (Ring Indicator)
- 3 : DSR (Data Set Ready)
- 4 : Not supported. DTR (Data Terminal Ready). This is not an output pin: trying to set its state raises the result code "ERROR"
- 5 : Not supported. RTS (Request To Send). This is not an output pin: trying to set its state raises the result code "ERROR"
- 6 : Not supported. RXD (Receive Data). This is not an output pin: trying to set its state raises the result code "ERROR"




7 : Not supported. TXD (Transmit Data)

<state>	integer	N/A	State of AT commands serial port interface output hardware pins (0, 2, 3) when pins are in GPIO mode (see #V24CFG):
----------------------	---------	-----	---

Values:

0 : Low state

1 : High state

-  If **<state>** is omitted the command returns the actual state of the pin **<pin>**.
-



AT#V24?

Read command returns actual state for all the available pins in the format:

```
#V24: <pin1>,<state1>[<CR><LF>
```

```
#V24: <pin2>,<state2>[...]]
```



AT#V24=?

Test command returns the supported values of parameters **<pin>** and **<state>**.

3.11. Power Down

3.11.1. AT#REBOOT - Module Reboot

Immediate module reboot.

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



AT#REBOOT

Execution command reboots immediately the unit.

It can be used to reboot the system after a remote update of the script in order to have the new one running.

- i If **#REBOOT** follows an AT command that stores some parameters in NVM, it is recommended to insert a delay of at least 5 seconds before to issue **#REBOOT**, to permit the complete NVM storing.
- i **#REBOOT** is an obsolete AT command; please refer to **#ENHRST** to perform a module reboot.

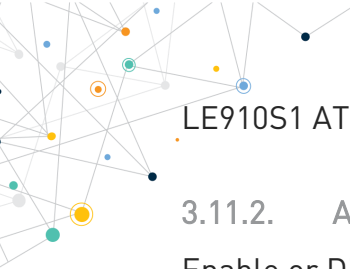


AT#REBOOT=?

Test command returns **OK** result code.



- Reboot the module
AT#REBOOT
OK
 (the module reboots)



3.11.2. AT#ENHRST - Periodic Reset

Enable or Disable the one shot or periodic unit reset

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

AT#ENHRST=<mode>,<delay>

Set commands enables/disables the unit reset after the specified <delay> in minutes

Parameters:

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

<mode>	integer	0	Enable\Disable mode
--------	---------	---	---------------------



Values:

0 : disables the unit reset

1 : enables the unit reset only one time (one shot reset)

2 : enables periodically unit reset

<delay>	integer	-	time interval in minutes after that the unit reboots
---------	---------	---	--

-  The settings are saved automatically in NVM only if old or new <mode> value is 2, i.e. unit set in periodic reset mode. Therefore, any change from 0 to 1 or conversely is not stored in NVM.
-  The command **AT#ENHRST=1,0** causes the immediate module reboot. If it follows an AT command that stores some parameters in NVM, it is strongly recommended to insert a delay of at least 5 sec before issuing it, to permit the complete NVM storing process.

 **AT#ENHRST?**

Read command reports the current parameter settings in the following format:

#ENHRST: <mode>[,<delay>,<remainingTime>]

Additional info:

- ▶▶ Read command parameter for **<mode>** =1 or 2.

Name	Type	Default	Description
<remainingTime>	integer	-	time in minutes remaining before next reset

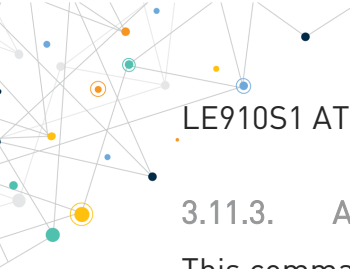
 **AT#ENHRST=?**

Test command reports supported range of values for parameters **<mode>** and **<delay>**.



Example of **#ENHRST** usage and expected unit behavior.

- **AT#ENHRST=1,60**
...
Module reboots after 60 minutes
- **AT#ENHRST=1,0**
Module reboots immediately
- **AT#ENHRST=2,40**
...
Module reboots after 40 minutes, and after every following power on, it will continue to reboot always after 40 minutes.



3.11.3. AT#SHDN - Software Shutdown

This command turns the module OFF.

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

AT#SHDN

Execution command causes device to detach from the network and shut down. Before definitive shut down an **OK** response is returned.

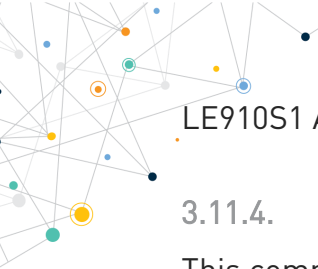
When issuing the command any previous activity terminated and the device will not respond to any further command.

To turn it on again hardware pin ON/OFF must be tied low.

The maximum time to shut down the device, completely is 25 seconds.

AT#SHDN=?

Test command returns **OK** result code.



3.11.4. AT#FASTSHDN - Fast Shutdown Configuration

This command can be used as a set command to configure a GPIO pin performing a fast shutdown when on it is forced a High to Low level transition. Or can be used as an execute command to force immediately a fast shutdown.

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


AT#FASTSHDN[=<enable>,<GPIO>]

Parameters:

Name	Type	Default	Description
<enable>	integer	0	enable/disable the fast shutdown execution via a GPIO pin.
Values:			
	0	:	disabled
	1	:	enabled
<GPIO>	integer	-	selects the GPIO to execute the fast shutdown. When the selected <GPIO> pin goes from High to Low level and the <enable> is set to 1, the module execute immediately the fast shutdown.

Additional info:

- ▶▶ The execution command **#FASTSHDN**<CR><LF> forces the module to execute immediately the fast shutdown.

-  The GPIO pin selected by the **#FASTSHDN** command must be used for this purpose only. If you need to use the selected GPIO pin for different activities, it must be free with the following command:

```
#FASTSHDN=0,<GPIO>
```



AT#FASTSHDN?

Read command reports the currently selected configuration in the format:

```
AT#FASTSHDN: <enable>,<GPIO>
```



AT#FASTSHDN=?

Test command returns the supported range of values for the parameters **<enable>** and **<GPIO>**.



Enable fast shutdown on GPIO_05

```
AT#FASTSHDN=1,5
```

```
OK
```

```
AT#FASTSHDN?
```

```
#FASTSHDN: 1,5
```

```
OK
```

Force immediate fast shutdown

```
AT#FASTSHDN
```

```
OK
```

3.12. Jamming Detection and Report

3.12.1. AT#JDRENH2 - Enhanced Jamming Detection and Report

This command enables/disable jamming detection, and reports the relative result to the user.



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

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



AT#JDRENH2=<mode>[,<sat2G>,<unused>,<carrNum2G>,<pRxLevT2G>,<unused>,<unused>,<unused>[,<P_RSRP_T4G>[,<P_RSRQ_T4G>[,<unused>]]]]

The set command performs the following activities:

- enables/disables the detection of the presence of jamming in the module coverage.

- selects one of the following two reports mode or both: on dedicated GPIO, by means of the URC, or GPIO + URC.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	enable/disable jamming detection and select reporting mode

Values:

0 : disable jamming detection

1 : enable jamming detection, and report its condition on a GPIO pin, see Additional info section



- 2 : enable jamming detection, and report its condition with an URC, see Additional info section
- 3 : enable jamming detection, and report its condition as <mode>=1 and <mode>=2
- 4 : enable jamming detection, and report its condition with an URC every 3 sec, see <mode>=2
- 5 : enable jamming detection, and report its condition as <mode>=1 and <mode>=4
- 6 : not used

<sat2G>	integer	45	is the starting absolute threshold of RSSI 2G Network. After a frequency scan in 2G bands, if the measured power of a carrier is greater than <sat2G> threshold, that carrier is counted as possible jammed carrier.
----------------------	---------	----	--

Value:

0÷63 : threshold values

<unused>	integer	N/A	unused parameter
-----------------------	---------	-----	------------------

Value:

0 : dummy value

<carrNum2G>	integer	100	is the minimum number of possible jammed carriers to consider that the module is under jamming condition
--------------------------	---------	-----	--

Value:

0÷200 : number of carriers

<pRxLevT2G>	integer	15	set the threshold of RxLev in 2G Network. The RxLev_Thr threshold is calculated as shown below:
--------------------------	---------	----	---



$$\text{RxLev_Thr} = \text{RxLev_Av} * (1 + \langle \text{pRxLevT2G} \rangle / 100)$$

where RxLev_Av is the average of the last RxLev measures.

Value:

0÷100 : values used to compute RxLev_Thr threshold

<unused>	integer	N/A	unused parameter
-----------------------	---------	-----	------------------

Value:

0 : dummy value

<unused>	integer	N/A	unused parameter
-----------------------	---------	-----	------------------

Value:

0 : dummy value

<unused>	integer	N/A	unused parameter
-----------------------	---------	-----	------------------

Value:

0 : dummy value

<P_RSRP_T4G>	integer	30	set the threshold of RSRP. The threshold (RSRP_Thr) is calculated as: $\text{RSRP_Thr} = \text{RSRP_Av} * (1 - \langle \text{P_RSRP_T4G} \rangle / 100)$ where RSRP_Av is the average of the last RSRP measures
---------------------------	---------	----	--

Value:

0÷100 : threshold of RSRP



<P_RSRQ_T4G>	integer	90	Set the threshold of RSRQ. The threshold (RSRQ_Thr) is calculated as $\text{RSRQ_Thr} = \text{RSRQ_Avg} * (1 - (\text{<P_RSRQ_T4G>/100})$ where RSRQ_Avg is the average of the last RSRQ measures.
---------------------------	---------	----	--

Value:

0÷100 : RSRQ threshold values

<unused>	integer	0	unused parameter
-----------------------	---------	---	------------------

Value:

0 : dummy value

Additional info:

▶▶ **<mode>=1**

The jamming condition is reported on pin GPIO_02 (JDR):

GPIO_02 (JDR) = Low, Normal Operating Condition

GPIO_02 (JDR) = High, Jammed Condition

To have information on GPIO_02 pin, refer to document [1]. GPIO_02 pin can be used also by other functionality, see **#GPIO** command.

▶▶ **<mode>=2**

the jamming condition is reported with a single URC on serial line, in the format:

#JDR: <status>

Unsolicited field:

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

<status> string jamming condition status, **<mode>=2**

Values:

JAMMED RAT : jamming condition detected, <RAT> is the Radio Access Technology: GSM or LTE.

OPERATIVE RAT : Normal Operating condition restored. Status shown only after a jamming condition has occurred.



AT#JDRENH2?

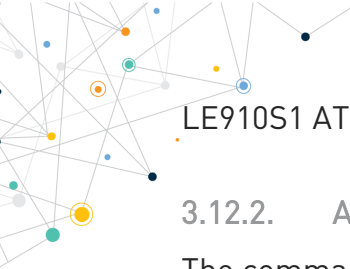
Read command reports the current parameters values, in the format:

```
#JDRENH2:<mode>,<sat2G>,0,<carrNum2G>,<pRxLevT2G>,0,0,0,<P_RSRP_T4G>,<P_RSRQ_T4G>,0
```



AT#JDRENH2=?


Test command reports the supported range of the parameters values.



3.12.2. AT#JDR4GCFG - LTE Jamming Detection Threshold Configuration

The command configures the LTE Jamming Detection thresholds.

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

 **AT#JDR4GCFG=<P_RSRP_T4G>,<P_RSRQ_T4G>,<unused>[,<Initial_Delay>[,<Sampling_Number>[,<P_RSSI_S4G>]]]**

Set command allows to configure the LTE Jamming Detection thresholds. After configuration, use the **#JDRENH2** command to enable/disable LTE jamming detection and select reporting mode.

Parameters:

Name	Type	Default	Description
<P_RSRP_T4G>	integer	30	<p>set the threshold of RSRP. The threshold (RSRP_Thr) is calculated as:</p> $\text{RSRP_Thr} = \text{RSRP_Av} * (1 + (\text{<P_RSRP_T4G>} / 100))$ <p>where RSRP_Av is the average of the last10 RSRP measures</p> <p>Value:</p> <p>0÷100 : threshold of RSRP</p>
<P_RSRQ_T4G>	integer	90	<p>set the threshold of RSRQ. The threshold (RSRQ_Thr) is calculated as:</p> $\text{RSRQ_Thr} = \text{RSRQ_Av} * (1 - (\text{<P_RSRQ_T4G>} / 100))$ <p>where RSRQ_Av is the average of the last 10 RSRQ measures</p> <p>Value:</p> <p>0÷100 : threshold of RSRQ</p>

<unused>	integer	N/A	unused parameter
Value:			
0 : dummy value			
<Initial_Delay>	integer	0	Sets the delay in tens of ms from power ON, to the beginning of the RSSI samples collection
Value:			
0÷1000 : Value of Initial Delay			
<Sampling_Number>	integer	30	Number of samples required to validate the Jamming condition.
Value:			
1÷200 : Number of samples			
<P_RSSI_S4G>	integer	-50	RSSI threshold level in dBm, above which the Jamming condition is detected.
Value:			
-120÷-20 : Value of RSSI Threshold			

- i** If you change the <P_RSRP_T4G> and <P_RSRQ_T4G> parameters of the **AT#JDR4GCFG** command, it will be automatically changed the parameters of the **AT#JDRENH2** command, too, without notice, and vice-versa.
- i** All the parameter settings are saved in NVM memory

AT#JDR4GCFG?

Read command returns the current settings in the format:

```
#JDR4GCFG:
<P_RSRP_T4G>,<P_RSRQ_T4G>,0,<Initial_Delay>,<Sampling_Number>,<P_RSSI_S4G>
```



?  AT#JDR4GCFG=?

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

3.13. Packet Domain

3.13.1. AT+CGCLASS - GPRS Mobile Station Class

This command sets the mode of operation

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

AT+CGCLASS=[<class>]

Set command sets the mode of operation according to <class> parameter.

Parameter:

Name	Type	Default	Description
<class>	string	N/A	mode of operation

Values:

- B : Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (lu mode)
- CG : Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation - (lu mode)
- CC : Class-C mode of operation in CS only mode (A/Gb mode), or CS (lu mode) - (lowest mode of operation)


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

AT+CGCLASS?

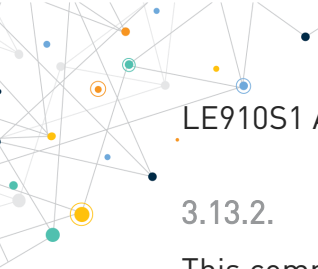
Read command returns the current value of the mode of operation in the format:

+CGCLASS: <class>



?  **AT+CGCLASS=?**

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



3.13.2. AT+CGQREQ - Quality of Service Profile (Requested)

This command allows to specify a Quality of Service Profile (requested) that is used when the terminal sends an Activate PDP Context Request message to the network.



3GPP TS 27.007
3GPP TS 03.060
3GPP TS 23.060

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



AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]]


Set command allows specify Quality of Service Profile that used when the terminal sends an Activate PDP Context Request message to the network. It specifies a profile for the context identified by the (local) context identification parameter, <cid>.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see +CGDCONT command).
<precedence>	integer	-	precedence class
<delay>	integer	-	delay class
<reliability>	integer	-	reliability class
<peak>	integer	-	peak throughput class
<mean>	integer	-	mean throughput class




If a value is omitted for a particular class then this class is not checked

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

AT+CGQREQ?

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

```
+CGQREQ:<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>
+CGQREQ:<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]
```

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

AT+CGQREQ=?

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

```
+CGQREQ: <PDP_Type>,
(list of supported <precedence>s),(list of supported <delay>s),
(list of supported <reliability>s),(list of supported <peak>s),
(list of supported <mean>s)
```

Additional info:

-  PDP type meaning.

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

-  Only the "IP" **<PDP_Type>** is currently supported.



AT+CGQREQ?

+CGQREQ: 1,0,0,3,0,0

OK

AT+CGQREQ=1,0,0,3,0,0

OK

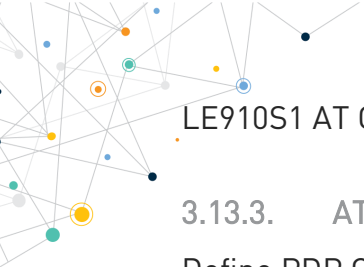
AT+CGQREQ=?

+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)

+CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31)

+CGQREQ: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31)

OK




3.13.3. AT+CGDCONT - Define PDP Context

Define PDP Context.



3GPP TS 27.007

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

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

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

Parameters:

Name	Type	Default	Description
<cid>	integer	-	(PDP Context Identifier) numeric parameter which specifies a particular PDP context definition. 1..max - where the value of max is returned by the Test command.
<PDP_type>	string	N/A	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.

Values:

- "IP" : Internet Protocol
- "PPP" : Point to Point Protocol
- "IPV6" : Internet Protocol, Version 6
- "IPV4V6" : Virtual <PDP_type> introduced to handle dual IP stack UE capability



<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
<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 for SMDCP only) 3 : RFC2507
<IPv4AddrAlloc>	integer	N/A	a numeric parameter that controls how the MT/TA requests to get the IPv4 address information.

Values:

- 0 : IPv4 Address Allocation through NAS Signaling
- 1 : IPv4 Address Allocated through DHCP

<Emergency_ind>	integer	N/A	a numeric parameter used to indicate whether the PDP context is for emergency bearer services or not.
------------------------------	---------	-----	---

Values:

- 0 : PDP context is not for emergency bearer services
 - 1 : PDP context is for emergency bearer services
-

- i** A special form of the Set command, **+CGDCONT=<cid>** causes the values for context number **<cid>** to become undefined, except **cid = 1** and emergency profile.
- i** Emergency profile could be undefined only after setting emergency indication parameter to 0.
- i** Although max number of PDP profile is 16, the user can only create 6 PDP profiles (persistent profiles), the rest 10 are temporary profiles.
- i** Profile 1 is the default profile and the attach profile, so even if you delete all profiles, the profile 1 is always regenerated regardless rebooting.
- i** In case of Verizon network operator, profile 3 is also used to attach profile. So, if delete 3 profile with **+CGDCONT=3** command, profile 3 is re-created after rebooting.
- i** Predefined PDP profile file that operator requested should not recommended to delete.

 **AT+CGDCONT?**

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

+CGDCONT:

<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,<IPv4AddrAlloc>,<Emergency_ind><CR><LF>

+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>,<IPv4AddrAlloc>,<Emergency_ind>

 **AT+CGDCONT=?**

Test command returns values supported as a compound value.

```
</> AT+CGDCONT=1,"IPV4V6","apn","10.10.10.10"
OK
```

AT+CGDCONT?

+CGDCONT: 1,"IPV4V6","apn","10.10.10.10",0,0,0,0

+CGDCONT: 2,"IPV4V6","ims","0.0",0,0,0,0

+CGDCONT: 3,"IPV4V6","sos","0.0",0,0,0,1

OK

AT+CGDCONT=?

+CGDCONT: (1-15),"IP",,,(0-2),(0-2),(0-1),(0-1)

+CGDCONT: (1-15),"PPP",,,(0-2),(0-2),(0-1),(0-1)

+CGDCONT: (1-15),"IPV6",,,(0-2),(0-2),(0-1),(0-1)

+CGDCONT: (1-15),"IPV4V6",,,(0-2),(0-2),(0-1),(0-1)

OK



3.13.4. AT+CGDSCONT - Define Secondary PDP Context

Define secondary PDP Context.



- [1] 3GPP TS 44.065
- [2] 3GPP TS 25.323
- [3] RFC1144
- [4] RFC2507
- [5] RFC3095

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



AT+CGDSCONT=[<cid>,<p_cid>,<d_comp>[,<h_comp>]]

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

The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. In EPS the command is used to define traffic flows.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP Context Identifier, see +CGDCONT command.
<p_cid>	integer	-	specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface.
<d_comp>	integer	0	controls PDP data compression (applicable for SMDCP only) (refer 3GPP TS 44.065)

Values:




- 0 : off (default if value is omitted)
- 1 : on (manufacturer preferred compression)
- 2 : V.42 bis

<h_comp> integer 0 controls PDP header compression (refer 3GPP TS 44.065 and 3GPP TS 25.323).

Values:

- 0 : off (default if value is omitted)
 - 1 : on (manufacturer preferred compression)
 - 2 : RFC1144 (applicable for SNDCP only)
 - 3 : RFC2507 - Not supported
 - 4 : RFC3095 (applicable for PDCP only) - Not supported
-

-  A special form of the set command, **+CGDSCONT= <cid>** causes the values for context number **<cid>** to become undefined.



AT+CGDSCONT?

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

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



AT+CGDSCONT=?

Test command returns the supported range of values of parameters.



3.13.5. AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters

This command returns parameters for a given **<cid>**.

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

AT+CGSCONTRDP[=<cid>]

The execution command returns **<p_cid>** and **<bearer_id>** for a given **<cid>**. If the parameter **<cid>** is omitted, the **<cid>**, **<p_cid>** and **<bearer_id>** returned for all active secondary PDP contexts. In EPS, the Traffic Flow parameters returned.

Format of the returned message:

```
+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[<CR><LF>
+CGSCONTRDP: <cid>,<p_cid>,<bearer_id> [...]]
```

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands.

Additional info:

- ▶▶ Here is the list of the parameters meanings returned by the **+CGSCONTRDP** command.

Name	Type	Default	Description
<p_cid>	integer	-	specifies a particular active secondary context definition or default EPS context Identifier which has been specified by use of the +CGDCONT command. The



			parameter is local to the TE-MT interface
<bearer_id>	integer	-	identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.

- i** Parameters for network-initiated PDP contexts returned as well. The dynamic part of the PDP context will only exist if established by the network.

?  AT+CGSCONTRDP=?

The test command returns a list of **<cid>**s associated with active secondary PDP contexts:



3.13.6. AT+CGDATA - Enter Data State

Execution command causes to perform whatever actions are necessary to establish a communication with the network using one or more GPRS PDP types.



3GPP TS 27.007

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



AT+CGDATA=[<L2P>[,<cid>[,...]]]

Parameters:

Name	Type	Default	Description
<L2P>	string	N/A	indicates the layer 2 protocol to be used
Value:			
"PPP" : PPP Point-to-point protocol			
<cid>	integer	-	specifies a particular PDP context definition (see +CGDCONT command).



If parameter <L2P> is omitted, the layer 2 protocol is unspecified



AT+CGDATA=?

Test command reports information on the supported layer 2 protocols.



```
AT+CGDATA=?  
+CGDATA: ("PPP")  
OK
```

```
AT+CGDATA="PPP",1  
OK
```



3.13.7. AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters

This command returns the relevant information about Traffic Flow Template for an active secondary or non secondary PDP context

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



AT+CGTFTRDP=[<cid>]

The execution command returns the relevant information about Traffic Flow Template for an active secondary or non secondary PDP context specified by <cid> together with the additional network assigned values when established by the network.

If the parameter <cid> is omitted, the Traffic Flow Templates for all active secondary and non secondary PDP contexts are returned.

Parameters of both network and MT/TA initiated PDP contexts returned.
Possible Response(s):

+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header(ipv6)>,<destination port range>,<source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label ipv6)>, <direction>, <NW packet filter Identifier><CR><LF>

+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>,<source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>, <direction>,<NW packet filter Identifier> [...]]

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition or Traffic Flows definition.

Additional info:

- The following parameters are defined in 3GPP TS 23.060
- <packet filter identifier>**: a numeric parameter. The value range is from 1 to 16.

 - <evaluation precedence index>**: a numeric parameter. The value range is from 0 to 255.

 - <source address and subnet mask>**: string type. The string is given as dot-separated numeric (0-255) parameters on the form:
"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or
"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.

 - <protocol number (ipv4) / next header (ipv6)>**: a numeric parameter, value range from 0 to 255.

 - <destination port range>**: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

 - <source port range>**: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

 - <ipsec security parameter index (spi)>**: numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.

 - <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**: string type. The string given as dot-separated numeric (0-255) parameters on the form "t.m".

 - <flow label (ipv6)>**: numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.

 - <direction>** a numeric parameter which specifies the transmission direction in which the Packet Filter shall be applied.
0- Pre-Release 7 TFT Filter (see 3GPP TS 24.008, table 10.5.162)
1- Uplink
2- Downlink
3- Bidirectional (Used for Uplink and Downlink)



<NW packet filter Identifier> a numeric parameter. The value range is from 1 to 16. In EPS the value is assigned by the network when established

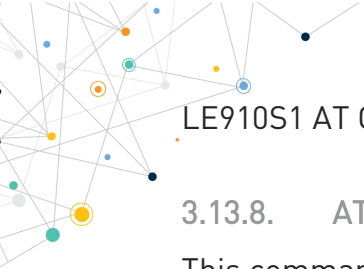
- i** Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations listed on 3GPP TS 23.060



AT+CGTFTRDP=?

+CGTFTRDP: (list of <cid>s associated with active secondary or non secondary contexts) in the format

+CGTFTRDP: (<cid>),(<operation code>), (<No of PKT filters>), (<packet filter identifier>), (<evaluation precedence index>), (<source address and subnet mask>), (<protocol number(ipv4)/next header(ipv6)>), (<destination port range>), (<source port range>), (<ipsec security parameter index(spi)>), (<type of service(tos)(ipv4) and mask/traffic class(ipv6) and mask>), (<flow label(ipv6)>), (<direction>)



3.13.8. AT+CGQMIN - Quality of Service Profile (Minimum Acceptable)

This command allows to specify a minimum acceptable profile of QoS.



3GPP TS 27.007
3GPP TS 03.060
3GPP TS 23.060

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




AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]

Set command allows specify a minimum acceptable profile, checked by the terminal against the negotiated profile returned in the Activate PDP Context Accept message.

Parameters:


Name	Type	Default	Description
<cid>	integer	-	PDP context identification (see +CGDCONT command)
<precedence>	integer	-	precedence class
<delay>	integer	-	delay class
<reliability>	integer	-	reliability class
<peak>	integer	-	peak throughput class
<mean>	integer	-	mean throughput class

- i** If a value is omitted for a class, then this class is not checked.
- i** A special form of the set command, **AT+CGQMIN=<cid>** causes the requested profile for context number <cid> to become undefined.

 **AT+CGQMIN?**

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

```
+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>
+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]
```

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

 **AT+CGQMIN=?**

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

```
+CGQMIN: <PDP_Type>,
(list of supported <precedence>s),(list of supported <delay>s),
(list of supported <reliability>s),(list of supported <peak>s),
(list of supported <mean>s)
```

Additional info:

- ▶▶ PDP type meaning.

Name	Type	Default	Description
<PDP_Type>	string	-	specifies the type of packet data protocol, see +CGDCONT command Only the "IP" <PDP_Type> is currently supported.



- `AT+CGQMIN=1,0,0,3,0,0` OK
`AT+CGQMIN?`
`+CGQMIN: 1,0,0,5,0,0`

OK
- `AT+CGQMIN=?`
`+CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)`
`+CGQMIN: "PPP",(0-3),(0-4),(0-5),(0-9),(0-18,31)`
`+CGQMIN: "IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31)`
`+CGQMIN: "IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31)`

OK

3.13.9. 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 in the format:

+CGPADDR: <cid>[,<PDP_addr_1>,<PDP_addr_2>][<CR><LF>

+CGPADDR: <cid>[,<PDP_addr_1>,<PDP_addr_2>][...]

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition (see +CGDCONT command). If no <cid> specified, the addresses for all defined contexts are returned. 1 - 24

Additional info:

►► <PDP_addr_1> and <PDP_addr_2>

each is a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the **+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none is available. Both <PDP_addr_1> and <PDP_addr_2> are included when both IPv4 and IPv6 addresses

are assigned, with **<PDP_addr_1>** containing the IPv4 address and **<PDP_addr_2>** containing the IPv6 address.

The string is given as dot-separated numeric (0-255) parameter of the form:

a1.a2.a3.a4 for IPv4 and

a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

- i** In dual-stack terminals (**<PDP_type> IPV4V6**), the IPv6 address will be provided in **<PDP_addr_2>**. For terminals with a single IPv6 stack (**<PDP_type> IPV6**) or due to backwards compatibility, the IPv6 address can be provided in parameter **<PDP_addr_1>**.



AT+CGPADDR=?

Test command returns a list of defined **<cid>**.



AT#GPRS=1

+IP: xxx.yyy.zzz.www

OK

AT+CGPADDR=1

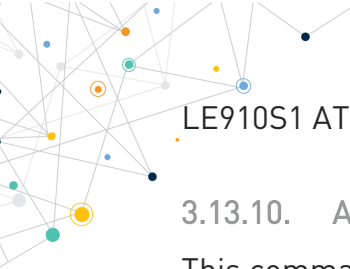
+CGPADDR: 1,"xxx.yyy.zzz.www"

OK

AT+CGPADDR=?

+CGPADDR: {1}

OK



3.13.10. AT+CGCMOD - Modify PDP Context

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

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

AT+CGCMOD=[<cid_n>[,...]]

The execution command is used to modify the specified PDP context(s) with respect to QoS profiles and TFTs. After command has completed, the MT returns to V.250 online data state. If the requested modification for any specified context cannot be achieved, an **ERROR** or **+CME ERROR** response is returned. Extended error responses are enabled by the **+CMEE** command.

For EPS, the modification request for an EPS bearer resource will be answered by the network by an EPS bearer

Modification request. The request must be accepted by the MT before the PDP context effectively changed.

Parameter:

Name	Type	Default	Description
<cid_n>	integer	-	specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

- If no parameters are specified (no <cid_n> specified), the command modifies all active contexts.

AT+CGCMOD=?

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



3.13.11. AT+CGTFT - Traffic Flow Template

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE.

The concept is further described in the 3GPP TS 23.060. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique **<packet filter identifier>**. A Packet Filter also has an **<evaluation precedence index>** that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

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

➡ **AT+CGTFT=[<cid>,<packet filter identifier>,<evaluationprecedenceindex>[,<source address and subnet mask> [,<protocol number(ipv4) / next header(ipv6)>,<destination portrange> [,<sourceport range>[,<ipsecsecurity parameter index (spi)> [,<typeof service (tos)(ipv4) and mask /traffic class (ipv6)and mask> [,<flowlabel (ipv6)>]]]]]]]]**

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE.

The set command specifies a Packet Filter that whom added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, **<cid>**. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the **+CGDCONT** and **+CGDSCONT** commands, the **+CGTFT** command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value.

Possible Response(s):

OK

ERROR

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Additional info:

► The following parameters are defined in 3GPP TS 23.060:

<**packet filter identifier**>: a numeric parameter, value range from 1 to 16.

<**evaluation precedence index**>: a numeric parameter. The value range is from 0 to 255.

<**source address and subnet mask**>: string type. The string is given as dot-separated numeric (0-255)

parameters on the form:

"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or

"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.

<**protocol number (ipv4) / next header (ipv6)**>: a numeric parameter, value range from 0 to 255.

<**destination port range**>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".


<**source port range**>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

<**ipsec security parameter index (spi)**>: numeric value in hexadecimal format. The value range is from 0 to FFFFFFFF.

<**type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask**>: string type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".

<**flow label (ipv6)**>: numeric value in hexadecimal format. The value range is from 0 to FFFFFF. Valid for IPv6 only.

- i** A special form of the set command, **+CGTFT= <cid>** causes all of the Packet Filters in the TFT for context number <cid> to become undefined.
- i** At any time there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an **ERROR** or **+CME ERROR** response is returned. Extended error responses are enabled by the **+CMEE** command.

-  Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060.

AT+CGTFT?

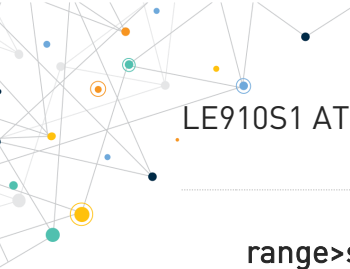
The read command returns the current settings for all Packet Filters for each defined context.

AT+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)> [
 <CR><LF>+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)> [...]]

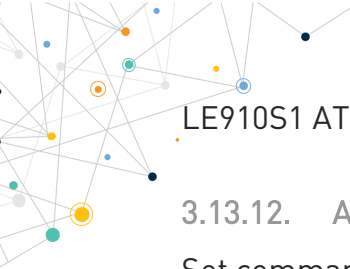
AT+CGTFT=?

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be use.

AT+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s) [
 <CR><LF>+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port



range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s) [...]]



3.13.12. AT#MSCLASS - Multislot Class Control

Set command sets the GPRS/EGPRS multislot class.

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

AT#MSCLASS=[<class>[,<autoattach>]]

Parameters:

Name	Type	Default	Description
<class>	integer	12	GPRS/EGPRS multislot class.



Value:

1÷12 : class

<autoattach>	integer	1	specify when the new multislot class will be enabled.
--------------	---------	---	---

Values:

- 0 : the new multislot class is enabled only at the next detach / attach or after a reboot. Not supported.
- 1 : the new multislot class is enabled immediately, automatically forcing a detach / attach procedure only in case of GSM network registered

-  It is only available for variants that support GSM.
-  If <autoattach> parameter value 0 is set, then AT#MSCLASS will return **ERROR** because this value is not supported.
The default value for <autoattach> parameter is 1

**AT#MSCLASS?**

Read command reports the current value of the multislot class in the format:

#MSCLASS: <class>

**AT#MSCLASS=?**

Test command reports the range of available values for both parameters **<class>** and **<autoattach>**.



3.13.13. 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:

<bearer_id>, <apn>, <ip&subnet>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr> and <P-CSCF_sec_addr> for an active non secondary PDP context with the context identifier <cid>.

If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned.

Possible response(s):

```
+CGCONTRDP:<cid>,<bearer_id>,<apn>[,<ip&subnet>[,<gw_addr>[,<DNS_prim_a
ddr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-
CSCF_sec_addr>]]]]][<CR><LF>
+CGCONTRDP:<cid>,<bearer_id>,<apn>[,<ip&subnet>[,<gw_addr>[,<DNS_prim_ad
dr>[,<DNS_sec_addr>[,<PCSCF_prim_addr>[,<PCSCF_sec_addr>]]]]][...]]
```

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
<bearer_id>	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. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Gateway address followed by the dot separated IPV6 Gateway Address. The gateway addresses are separated by space.
<DNS_prim_addr>	string	-	IP address of the primary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.
<DNS_sec_addr>	string	-	IP address of the secondary DNS Server.



			If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.
<P_CSCF_prim_addr>	string	-	IP address of the primary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 primary Address of P-CSCF Server.
<P_CSCF_sec_addr>	string	-	IP address of the secondary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of 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"

If the MT has dual stack capabilities the string shows first the dot separated IPv4 Address followed by the dot Separated IPv6 Address. The IPv4 address and the IPv6 address parameters are separated by space:
"a1.a2.a3.a4 a1.m1.m2.m3.m4"

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"

- 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** The execution command
AT+CGCONTRDP=9
returns
+CME ERROR: 100

AT+CGCONTRDP?

Read command returns

+CGCONTRDP: 1

OK

AT+CGCONTRDP=?

Return the list of <cid>s associated with active contexts in the following form

**+CGCONTRDP: (<p_cid>), (<bearer_id>), (<apn>), (<source_addr and
subnet_mask>), (<gw_addr>), (<DNS_prim_addr>), (<DNS_sec_addr>), (<P-
CSCF_prim_addr>), (<P-CSCF_sec_addr>), (<IM_CN_Signalling_Flag>)**



3.13.14. AT+CGEQOS - Define EPS Quality of Service

The command specifies the EPS Quality of Service parameters.



[1] 3GPP TS 23.203

[2] 3GPP TS 24.301

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



AT+CGEQOS=[<cid>[,<QCI> [,<DL_GBR>,<UL_GBR> [,<DL_MBR>,<UL_MBR>]]]]

Set command specifies the EPS Quality of Service parameters.

A special form of the set command, **+CGEQOS= <cid>** causes the values for context number **<cid>** to become undefined.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	it specifies a particular EPS Traffic Flows definition in EPS
<QCI>	integer	9	it specifies a class of EPS QoS, see standard [1].
Values:			
0	:	QCI is selected by network	
1÷4	:	value range for guaranteed bit rate Traffic Flows	
5÷9	:	value range for non-guaranteed bit rate Traffic Flows	
<DL_GBR>	integer	-	it indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].

<UL_GBR>	integer	-	indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].
<DL_MBR>	integer	-	it indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].
<UL_MBR>	integer	-	it indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI, see standard [2].

Additional info:

- ▶▶ Possible Response(s):
+CME ERROR: <err>

AT+CGEQOS?

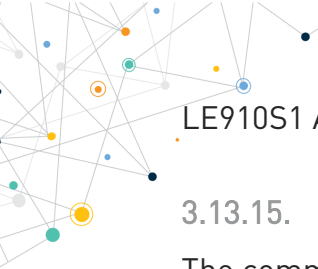
Read command returns the current settings for each defined QoS.

+CGEQOS: <cid>,
<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<CR>>LF]+CGEQOS:
<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][...]

AT+CGEQOS=?

Test command returns the ranges of the supported parameters:

+CGEQOS: (list of supported <cid>s),(list of supported <QCI>s), (list of supported <DL_GBR>s), (list of supported <UL_GBR>s), (list of supported <DL_MBR>s),(list of supported <UL_MBR>s)



3.13.15. AT+CGEQOSRDP - EPS Quality of Service Read Dynamic Parameters

The command returns the parameters related to the Quality of Service.

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

AT+CGEQOSRDP=[<cid>[,...]]

The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] of the active secondary or non secondary PDP context associated to the provided context identifier <cid>.

Possible Response(s):

```
+CGEQOSRDP:<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>]
[<CR>>LF>
+CGEQOSRDP:<cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>]
[...]]
```

See **+CGEQOS** command to have information on the meaning of the returned parameters.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	It specifies a particular Traffic Flows definition in EPS and a PDN connection definition in UMTS/GPRS.

- If the parameter <cid> is omitted, the Quality of Service parameters for all established PDN connections are returned.

AT+CGEQOSRDP=?

The test command returns a list of <cid>s associated with active contexts.



Parameters of both network and MT/TA initiated PDN connections will be returned.



3.13.16. AT+CGPIAF - Printing IP Address Format

This command selects the printout format of the IPv6 address.



3GPP TS 27.007

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



AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros> [,<Pv6_CompressZeros>]]]]

Set command decides what the format to print IPv6 address parameter.

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.
-

AT+CGPIAF?

Read command returns the current parameter setting.

AT+CGPIAF=?

Test command returns supported values in the format:

+CGPIAF: (0-1),(0-1),(0-1),(0-1)

OK

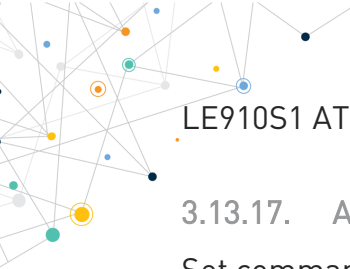


```
AT+CGPIAF=0,0,0,0  
OK
```

```
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
```



3.13.17. AT+CEVDP - Voice Domain Preference

Set command selects the voice domain preference.

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



AT+CEVDP=<domain>

Parameter:

Name	Type	Default	Description
<domain>	string	3	voice domain preference.

Values:

- 1 : CS voice only
- 2 : CS voice preferred, IMS PS voice as secondary
- 3 : IMS PS voice preferred, CS as secondary
- 4 : IMS PS voice only

i The domain is saved into the NVM

i AT+CEVDP=6
returns
+CME ERROR: 50




AT+CEVDP?

Read command returns the selected domain in the format:

+CEVDP: <domain>



 **AT+CEVDP=?**

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



3.13.18. AT+CGACT - PDP Context Activate or Deactivate

This command activates or deactivates the specified PDP context(s).



3GPP TS 27.007

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



AT+CGACT=[<state>[,<cid>[,<cid>][,...]]]

Execution command is used to activate or deactivate the specified PDP context(s)

Parameters:

Name	Type	Default	Description
<state>	integer	N/A	activate/deactivate the PDP context
Values:			
	0	:	deactivate
	1	:	activate
<cid>	integer	-	specifies a PDP context definition (see +CGDCONT command)

- i** If no <cid> are specified the activation/deactivation form of the command activates/deactivates all defined contexts.



AT+CGACT?

Read command returns the current activation state for all the defined PDP contexts in the format:



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



AT+CGACT=?

Test command reports information on the supported PDP context activation states parameters in the format:

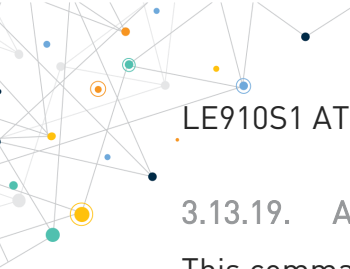
+CGACT: (0,1)



```
AT+CGACT=1,1  
OK
```

```
AT+CGACT?  
+CGACT: 1,1
```

```
OK
```

3.13.19. 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 or disables sending of unsolicited result codes +CGEV: XXX from TA to TE in the case of certain events occurring in the TA or 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)
-

Additional info:

- ▶▶ The following unsolicited result codes and the corresponding events are defined:

+CGEV: NW DEACT <p_cid>, <cid>

The network has deactivated a context. The **<cid>** for this context is provided to the TE in addition to the associated primary **<p_cid>**.

+CGEV: ME DEACT <p_cid>, <cid>

The mobile termination has forced a context deactivation. The associated **<cid>** is provided to the TE in addition to the PDN connection associated **<p_cid>**.

+CGEV: ME ACT <p_cid>, <cid>

The network has responded to an ME initiated Traffic Flow activation request with an EPS bearer activation or modification. The associated MT allocated context identifier **<cid>** is provided to the TE in addition to the PDN connection associated **<p_cid>**.

+CGEV: NW ACT <p_cid>, <cid>

The network has activated a context. The **<cid>** for this context is provided to the TE in addition to the associated primary **<p_cid>**.

+CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: NW PDN ACT <cid>

The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE.

+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]]

The mobile termination has activated a PDN connection. For <reason> and <cid_other> parameters see below.

+CGEV: NW PDN DEACT <cid>

The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated <cid> for this context is provided to the TE.

+CGEV: ME PDN DEACT <cid>

The mobile termination has deactivated a PDN connection. The associated <cid> is provided to the TE.

+CGEV: EPS ACT <cid>

The network has activated a PDP context. The associated <cid> is provided to the TE.

+CGEV: EPS MODIFY <cid>, <change_reason>

The network has modified EPS bearer context parameter(s). The associated <cid> is provided to the TE in addition of the change reason: TFT and/or QoS modification. For <change_reason> parameter see below

+CGEV: NW REATTACH

Internal definition. Used to notify IMS the NW reattach action

Name	Type	Default	Description
<reason>	integer	N/A	indicates the reason why the context activation



request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with **<cid>** is IPv4v6, and the PDP type assigned by the network for **<cid>** is either IPv4 or IPv6.

Values:

- 0 : IPv4 only allowed
- 1 : IPv6 only allowed
- 2 : single address bearers only allowed
- 3 : single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful

<cid_other>	integer	-	indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MTinitiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid_other> .
--------------------------	---------	---	--

<change_reason>	integer	N/A	indicates what kind of change occurred
------------------------------	---------	-----	--

Values:

- 1 : TFT only changed
- 2 : QoS only changed
- 3 : Both TFT and QoS changed

Unsolicited fields:

Name	Type	Description
<PDP_type>	string	Packet Data Protocol type, which specifies the type of packet data protocol
<PDP_addr>	string	identifies the terminal in the address space applicable to the PDP
<cid>	string	PDP Context Identifier
<p_cid>	string	Primary PDP Context Identifier



AT+CGEREP?

Read command returns the current <mode> and <bfr> settings, in the format:

+CGEREP: <mode>,<bfr>

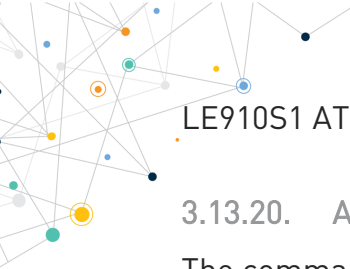


AT+CGEREP=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



3.13.20. AT+CGREG - GPRS Network Registration Status

The command enables/disables the GPRS 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	No	No	-	2



AT+CGREG=[<n>]

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

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

long format: **+CGREG:<stat>[,<lac_tac>,<ci>[,<AcT>,<rac_mme_code>]]**

Parameter:

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

<n>	integer	0	enables/disables the GPRS network registration unsolicited result code, and selects one of the two formats.
-----	---------	---	---

The URC short format is displayed every time there is a change in the GPRS network registration status.

The URC long format is displayed every time there is a change of the network cell.

Values:

- 0 : disable the network GPRS registration unsolicited result code
- 1 : enable the network GPRS registration unsolicited result code, and selects the short format

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

Unsolicited fields:

Name	Type	Description
<stat>	integer	registration status of the module Values: 0 : not registered, terminal is not currently searching a new operator to register to 1 : registered, home network 2 : not registered, but terminal is currently searching a new operator to register to 3 : registration denied 4 : unknown 5 : registered, roaming
<lac_tac>	string	location area code (2G, 3G) or tracking area code (4G) in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string	cell ID in hexadecimal format
<AcT>	integer	access technology of the serving cell Values: 0 : GSM 2 : UTRAN 3 : GSM w/EGPRS 4 : UTRAN w/HSDPA 5 : UTRAN w/HSUPA



	6	: UTRAN w/HSDPA and HSUPA
	7	: E-UTRAN (not applicable)
	8	: EC-GSM-IoT (A/Gb mode)
	9	: E-UTRAN (NB-S1 mode) (not applicable)

<rac_mme_code>	string	one byte routing area code (2G, 3G) or Mobile Management Entity code (4G) in hexadecimal format
-----------------------------	--------	---

**AT+CGREG?**

Read command returns the status of result code presentation mode **<n>** and the integer **<stat>** which shows whether the network has currently indicated the registration of the terminal in the format:

+CGREG : <n>,<stat>[,<lac_tac>,<ci>,<Act>,<rac_mme_code>]

- i** **<lac_tac>,<ci>,<Act>** and **<rac_mme_code>** are reported only if **<n>=2** and the mobile is registered on some network cell.

**AT+CGREG=?**

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



- ⚠** **ERRATA:** Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"



3.13.21. 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
```



3.14. IPEasy

3.14.1. AT#SGACT - Context Activation

This command enables/disables the context activation.

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

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

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

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	PDP context identifier PDP context identifier numeric parameter which specifies a particular PDP context definition The value of max is returned by the Test command.
Value:			
1÷max : specifies a particular PDP context definition (see +CGDCONT command)			
<stat>	integer	N/A	activate/deactivate the PDP context specified
Values:			
0 : deactivate the context			
1 : activate the context			
<userId>	string	-	userId, used only if the context requires it

<pwd> string - password, used only if the context requires it

Additional info:

- ▶ Execution command returns a list of IP addresses for the specified context identifiers in the format:

If IP or IPV6 PDP context:


#SGACT: <ipAddr>

For DUAL STACK IPV4V6 PDP context:

#SGACT: [<ipAddrV4>],[<ipAddrV6>]

Name	Type	Default	Description
<ipAddr>	string	-	ip address ipv4 or ipv6
<ipAddrV4>	string	-	ip address ipv4 (if v4 PDP context activated)
<ipAddrV6>	string	-	ip address ipv6 (if v6 PDP context activated)

- i** Context activation/deactivation returns ERROR if there is not any socket associated to it (see **AT#SCFG**).
- i** In LTE network, default PDP context (<cid> = 1) is activated by piggybacking on LTE attach procedure and maintained until detached from NW. This command with <cid> = 1 is just binding or unbinding application to the default PDP context.
- 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** PDP authentication is changed by **#SGACTAUTH** and **#USERID** and **#PASSW** when activated using **#SGACT** and it is synchronized with the **#PDPAUTH** and you cannot sync when you are deactivated.

-  PDP context deactivation returns an ERROR if the socket session of applications such as Socket, FTP and etc. is active.

AT#SGACT?

Read command returns the state of all the contexts that have been defined in the format:

```
#SGACT: <cid1>,<stat1><CR><LF>
```

...

```
#SGACT: <cidmax>,<statmax>
```

Additional info:

- ▶▶ parameters meaning

Name	Type	Default	Description
<cidn>	integer	-	as <cid> in Set section
<statn>	integer	N/A	context status

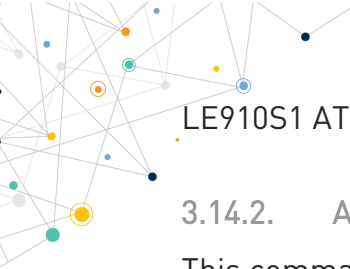
Values:

0 : context deactivated

1 : context activated

AT#SGACT=?

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



3.14.2. AT#SGACTCFG - PDP Automatic Context Activation-Reactivation

This command configures the automatic activation/reactivation of the specified PDP context

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



AT#SGACTCFG=<cid>,<retry>[,<delay>[,<urcmode>]]

Set command is used to enable or disable the automatic activation/reactivation of the context for the specified PDP context, to set the maximum number of attempts and to set the delay between an attempt and the next one. The context is activated automatically after every GPRS Attach or after a NW PDP CONTEXT deactivation if at least one IPEasy socket is configured to this context (see **AT#SCFG**).

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	numeric parameter which specifies a particular PDP context definition. The value of max is returned by the Test command

Value:

1÷max : specifies a particular PDP context definition

<retry>	integer	0	specifies the maximum number of context activation attempts in case of activation failure
---------	---------	---	---

Values:

0 : disable the automatic activation/reactivation of the context

1÷15 : supported range



<delay>	integer	N/A	specifies the delay in seconds between an attempt and the next one
Value:			
180÷3600 : supported range			

<urcmode>	integer	0	URC presentation mode.
Values:			
0 : disable unsolicited result code			
1 : enable unsolicited result code, after an automatic activation/reactivation, of the local IP address obtained from the network. It has meaning only if <auto>=1			

Additional info:

- ▶▶ The unsolicited message is in the format:

If IP or IPV6 PDP context:

#SGACT: <ip_address>

For DUAL STACK IPV4V6 PDP context:

#SGACT: [<ipAddrV4>],[<ipAddrV6>]

Reporting the local IP address obtained from the network.

- i** The URC presentation mode **<urcmode>** is related to the current AT instance only. Last **<urcmode>** setting is saved for every instance as extended profile parameter, thus it is possible to restore it even if the multiplexer control channel is released and set up, back and forth.
- i** **< retry >** and **<delay>** setting are global parameters saved in NVM.
- i** If the automatic activation is enabled on a context, then it is not allowed to modify by the command **#SCFG** the association between the context itself and the socket connection identifier; all the other

parameters of command **#SCFG** are modifiable while the socket is not connected.

- i** The context is also activated automatically after successful **AT#SGACTCFG** set command.



AT#SGACTCFG?

Read command reports the states of all configured PDP contexts, in the format:

```
#SGACTCFG: <cid1>,<retry1>,<delay1>, <urcmode>CR><LF>
```

...

```
#SGACTCFG: <cidn>,<retryn>,<delayn>,<urcmode>
```

Additional info:

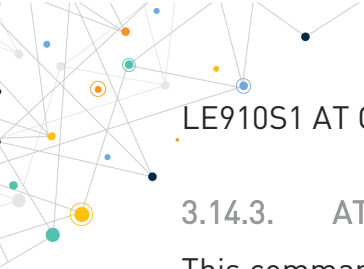
- ▶▶ parameters meaning.

Name	Type	Default	Description
<cid _n >	integer	-	PDP context identifier
<retry _n >	integer	-	specifies the maximum number of context activation attempts in case of activation failure
<delay _n >	integer	-	specifies the delay in seconds between an attempt and the next one
<urcmode>	integer	-	URC presentation mode



AT#SGACTCFG=?

Test command reports supported range of values for parameters <cid>, <retry>, <delay> and <urcmode>.



3.14.3. AT#SCFG - Socket Configuration

This 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	N/A	specifies a particular PDP context definition
Value:			
1÷max	:	The value of max is returned by the Test command	
<pktSz>	integer	N/A	Packet size in bytes to be used by the TCP/UDP/IP stack for data sending. Used for online data mode only.
Values:			
0	:	automatically chosen by the device	
1÷1500	:	packet size in bytes	
<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.
-----------------------	---------	-----	--

Value:

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

i These values are automatically saved in NVM.



AT#SCFG?

Read command returns the current socket configuration parameters values for all the six sockets, in the format:

```
#SCFG:
<connId1>,<cid1>,<pktsz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF>
#SCFG:
<connId2>,<cid2>,<pktsz2>,<maxTo2>,<connTo2>,<txTo2><CR><LF>
...
#SCFG: <connId6>,<cid6>,<pktsz6>,<maxTo6>,<connTo6>,<txTo6>
```



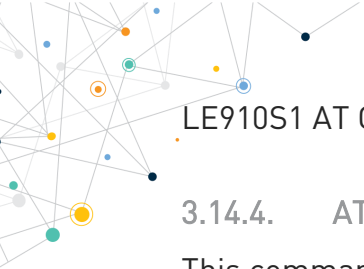
AT#SCFG=?

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



3.14.4. AT#SCFGEXT - Socket Configuration Extended

This command sets the socket configuration extended parameters.

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

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

Set command sets the socket configuration extended parameters.

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
Value:			
1÷6 : socket connection identifier			
<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			
<hr/>			
<ListenAutoRsp>	integer	0	set the listen auto-response mode, that affects the commands #SL and #SLUDP
Values:			
0 : deactivated			
1 : activated			
<hr/>			
<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

- i** KeepAlive Interval - Interval between two successive keepalive retransmissions, if acknowledgement to the previous keepalive transmission is not received.
Non configurable value: 75 sec.

KeepAlive Probes - The number of unacknowledged retransmissions to send out before closing socket.
Non configurable value: 9 retransmissions.
- i** These values are automatically saved in NVM
- i** 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.
- i** **<sendDataMode>** parameter has effect on **#SSEND** and **#SSENDUDP**

AT#SCFGEXT?

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

```
#SCFGEXT: <connId1>,
<srMode1>,<recvDataMode1>,<keepalive1>,<ListenAutoRsp1>,<sendDataMode1><C
R><LF>
```

...

```
#SCFGEXT: <connId6>,
<srMode6>,<recvDataMode6>,<keepalive6>,<ListenAutoRsp6>,<sendDataMode6>
```

? 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
```

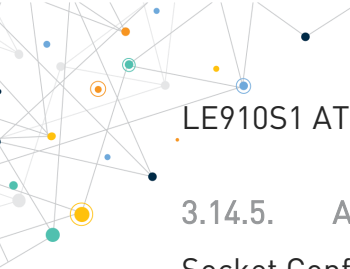
```
#SCFGEXT: 3,1,1,0,0,0
```

```
#SCFGEXT: 4,0,1,0,0,1
```

```
#SCFGEXT: 5,0,0,0,0,0
```

```
#SCFGEXT: 6,0,0,0,0,0
```


```
OK
```



3.14.5. 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÷6 : socket connection identifier value

<bufferStart>	integer	0	<p>Set the sending timeout method based on new data received from the serial port (<txTo> timeout value is set by #SCFG command).</p> <p>Restart of transmission timer done when new data received from the serial port.</p> <p>It is necessary to avoid overlapping of the two methods.</p> <p>Enabling new method, the old method for transmission timer (#SCFG) automatically</p>
----------------------------	---------	---	--



disabled to avoid overlapping.
Check if new data have been received from serial port is done with a granularity that is directly related to **#SCFG<txTo>** setting with a maximum period of 1 sec

Values:

- 0 : old behaviour for transmission timer (#SCFG command 6th parameter old behaviour, start only first time if new data are received from the serial port)
- 1 : new behaviour for transmission timer: Restart when new data received from serial port

<abortConnAttempt>	integer	0	Enable connection attempt (#SD / #SKTD) abort before CONNECT (online mode) or OK (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>

For possible <cause> values, see also **#SLASTCLOSURE**

Like **#SLASTCLOSURE**, in case of subsequent consecutive closure causes received, the original disconnection cause indicated.

In the case of command mode connection and remote closure with subsequent inactivity timeout closure without retrieval of all available data (**#SRECV** or **SRING** mode 2), it is indicated cause 1 for both possible FIN and RST from remote. parameters values for all the six sockets, in the format:

```
#SCFGEXT2:<connId1>,<bufferStart1>,<abortConnAttempt>,0,0, 0  
<CR><LF>
```

...

```
#SCFGEXT2:<connId1>,<bufferStart1>,<abortConnAttempt>,0,0, 0
```

- 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=?

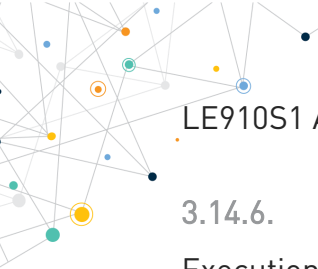
Test command returns the range of supported values for all parameters.



```
AT#SCFGEXT2=1,1
OK
AT#SCFGEXT2=2,1
OK
AT#SCFGEXT2?
#SCFGEXT2: 1,1,0,0,0,0
#SCFGEXT2: 2,1,0,0,0,0
#SCFGEXT2: 3,0,0,0,0,0
#SCFGEXT2: 4,0,0,0,0,0
#SCFGEXT2: 5,0,0,0,0,0
#SCFGEXT2: 6,0,0,0,0,0
OK
AT#SCFG?
#SCFG: 1,1,300,90,600,50
#SCFG: 2,1,300,90,600,50
#SCFG: 3,1,300,90,600,50
#SCFG: 4,2,300,90,600,50
#SCFG: 5,2,300,90,600,50
#SCFG: 6,2,300,90,600,50
OK
AT#SCFG=1,1,300,90,600,30
OK
```

Current configuration: socket with connId 1 and 2 are configured with new transmission timer behaviour.


<txTo> corresponding value has been changed (**#SCFG**) for connId 1, for connId 2 has been left to default value.



3.14.6. 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÷6 : socket connection identifier value
<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. 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 - 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
<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.

- If we set **<connMode>** to online mode connection and the command is successful we enter in online data mode and we see the intermediate result code **CONNECT**. After the **CONNECT** we can open additional online mode connection only after suspending the first socket connection (socket stays open) using the escape sequence (**+++**).

? 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

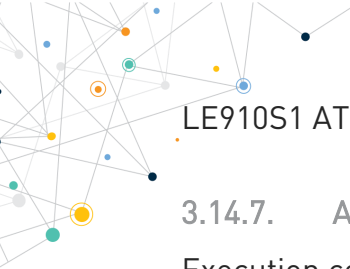
...

...

Open socket 1 in command mode

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

OK



3.14.7. 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

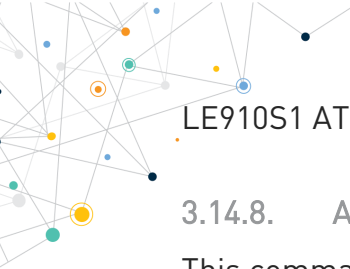
Value:

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



AT#SO=?

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



3.14.8. AT#SH - Socket Shutdown

This command is used to close 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

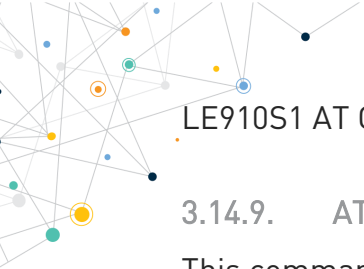
Value:

1÷6 : socket connection identifier

- A socket connection can be closed only when it is in suspended mode (with pending data too). Trying to close an active socket connection will produce an error.

AT#SH=?

Test command reports the range for parameter <connId>



3.14.9. AT#SL - Socket Listen

This 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 (see **#FRWL**), an URC is received:

+SRING : <connId>

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

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

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

#SKTL: ABORTED



AT#SL?

Read command returns all the actual listening TCP sockets.



AT#SL=?

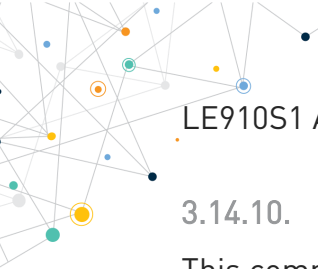
Test command returns the range of supported values of the parameters.



Open a socket listening for TCP on port 3500.

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

```
OK
```



3.14.10. 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÷6 : socket connection identifier			
<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			

-  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 (see **#FRWL**), 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 (see command **#FRWL**), the connection is automatically accepted: the **CONNECT** indication is given and the modem goes into online data mode.

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

#SLUDP: ABORTED

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



AT#SLUDP?

Read command returns all the actual listening UDP sockets.



AT#SLUDP=?

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



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

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





3.14.11. 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>

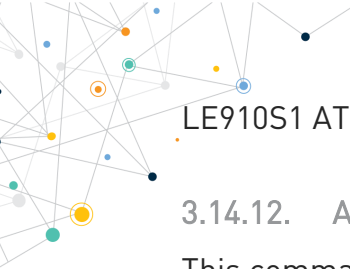
Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	Socket connection identifier.
Value:			
1÷6 : Socket connection identifier value			
<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.

AT#SA=?

Test command reports the range of values for all the parameters.



3.14.12. 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>

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.

Parameter:


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

<connId>	integer	N/A	Selection on which Socket connection identifier send data.
-----------------------	---------	-----	--

Value:


1÷6 : Socket connection identifier supported

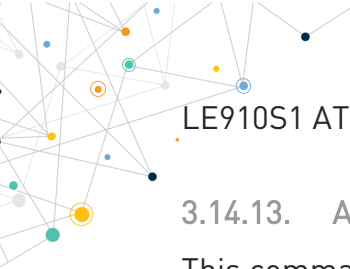
- i** The maximum number of bytes to send is 1500 bytes
- i** It is possible to use **#SSEND** only if the connection was opened by **#SD**, else the ME is raising an error.

-
-  A byte corresponding to BS char (0x08) is treated with its corresponding meaning; therefore previous byte will be cancelled (and BS char itself will not be sent).
-

AT#SSEND=?

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

 Send data through socket number 2
AT#SSEND=2
>Test<CTRL-Z>
OK



3.14.13. 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>

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÷6 : 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

- i** It's possible to use **#SSENDEXT** only if the connection was opened by **#SD**, else the modem returns an error.
- i** All special characters are sent like a generic byte.

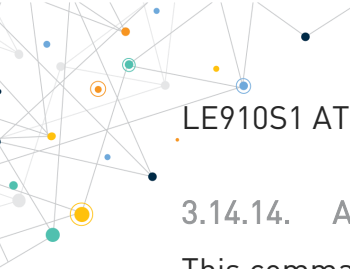
?  AT#SSENDEXT=?

Test command returns the range of supported values for parameters <conId> and <bytesToSend>.

</> 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.



3.14.14. AT#SRECV - Socket Receive Data in Command Mode

This 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	N/A	socket connection identifier
Value:			
1÷6 : socket connection identifier.			
<maxByte>	integer	N/A	max number of bytes to read
Value:			
1÷1500 : max number of bytes to read			
<UDPInfo>	integer	0	enables/disables the visualization of UDP datagram information.
Values:			
0 : UDP information disabled			
1 : UDP information enabled, see Additional info section.			

Additional info:



- If `<UDPIInfo>` is set to 1 (`AT#SRECV=<connId>,<maxBytes>,1`), the command returns a message having the following format:

`#SRECV: <remoteIP>,<remotePort><connId>,<recData>,<dataLeft>`

Name	Type	Default	Description
<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.

- i** Issuing `#SRECV` when there is no buffered data raises an error.



AT#SRECV=?

Test command returns the range of supported values for parameters `<connId>` `<maxByte>` and `<UDPIInfo>`.



SRING URC

(<srMode> be 0, <dataMode> be 0) telling data have just come through connected socket identified by <connId>=1 and are now buffered

SRING: 1

Read in text format the buffered data

AT#SRECV=1,15

#SRECV: 1,15

test string

OK

Or:

if the received datagram, received from <IPaddr> and <IPport> is of 60 bytes

AT#SRECV=1,15,1

#SRECV: <IPaddr>,<IPport>,1,15,45

test string

OK

SRING URC

(<srMode> be 1, <dataMode> be 1) telling 15 bytes data have just come through connected socket identified by <connId>=2 and are now buffered

SRING: 2,15

Read in hexadecimal format the buffered data

AT#SRECV=2,15

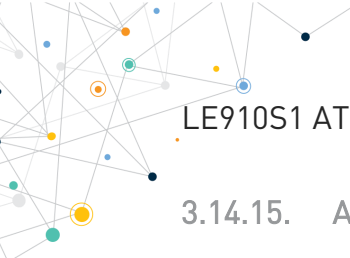
#SRECV: 2,15 737472696e67612064692074657374

OK

SRING URC

(<srMode> be 2, <dataMode> be 0) displaying (in text format) 15 bytes data that have just come through connected socket identified by <connId>=3; there is no need to issue **#SRECV** to read the data; no data remain in the buffer after this URC

SRING: 3,15, test string



3.14.15. 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>

This command allows, while the module is in command mode, to send data over UDP to a specific remote host. UDP connection has to be previously completed with a first remote host through **#SLUDP / #SA**. Then, if module receives data from this or another host, it is able to send data to it. Like command **#SSEND**, the device responds with ">" prompt and waits for the data to send.

Parameters:

Name	Type	Default	Description
<connId>	integer	1	socket connection identifier
	Value:	1÷6	: 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

-  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).

-
- i** If successive resume of the socket to online mode is performed (**#SO**), connection with first remote host is restored as it was before.
 - i** The maximum number of bytes to send is 1500.
-

?  AT#SSENDUDP=?

Test command reports the supported range of values for parameters **<connId>**, **<remoteIP>** and **<remotePort>**.



- 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



3.14.16. 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[=<connId>]

Set command reports the current socket status for the selected socket in the format::

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort>

If optional parameter <connId> is not present, execution command reports the current socket status for all the sockets in the format:

#SS: <connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>
[<connId>,<state>,<locIP>,<locPort>,<remIP>,<remPort><CR><LF>[...]]

Parameter:

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

Value:

1÷6 : socket connection identifier

Additional info:

- ▶▶ Other parameters meaning.

Name	Type	Default	Description
<state>	integer	N/A	actual state of the socket

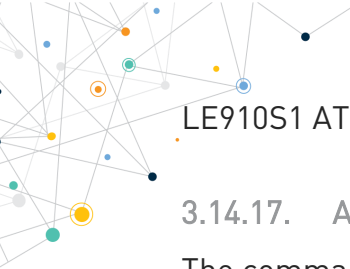
Values:

- 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 returns the **OK** result code.



3.14.17. AT#NTP - Calculate and Update Date and Time with NTP

The command handles the date and time update using NTP protocol.

SIM Presence	Setting saved	Can be aborted	MAX timeout	SELINT
Required	No	No	10 s	2

AT#NTP=<NTPAddr>,<NTPPort>,<updModClock>,<timeout>[,<timeZone>]

Execution command permits to calculate and update date and time through NTP protocol sending a request to a NTP server. The command returns an intermediate response having the following format:

Execution command permits to calculate and update date and time through NTP protocol sending a request to a NTP server. By default, #NTP uses the PDP context identifier <cid>=1, see +CGDCON command. Make sure that <cid>=1 is not used, otherwise the command returns an **ERROR**.

#NTP: <time><CR><LF>OK<CR><LF>

or

<CR><LF>ERROR<CR><LF>

The <time> parameter is described in Additional info section.

Parameters:

Name	Type	Default	Description
<NTPAddr>	string	-	address of the NTP server. This parameter can be either: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query
<NTPPort>	integer	N/A	NTP server port to contact

Value:



1÷65535 : port

<updModClock> integer N/A update mode

Values:

0 : no update module clock

1 : update module clock

<timeout> integer N/A waiting timeout for server response in seconds

Value:

1÷10 : waiting timeout for server response in seconds

<timeZone> string 0 Time Zone: indicates the difference, expressed in quarter of an hour, between the local time and GMT.

Value:

-47÷48 : Time Zone

Additional info:

- ▶▶ Intermediate response parameter.

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

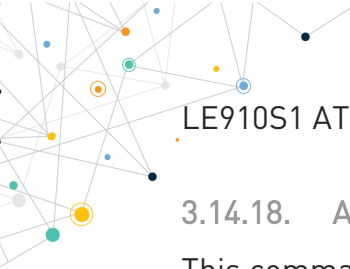
- i** The Time Zone is applied directly in the Date and Time received by the NTP Server, that is, by definition, GMT+0.

AT#NTP=?



Test command returns the maximum length for **<NTPAddr>** string, and supported range of values of parameters: **<NTPPort>**, **<updModClock>**, **<timeout>** and **<timeZone>**.


```
</> AT#NTP="ntp1.inrim.it",123,1,2,4
#NTP: 12/01/27,14:42:38+04
OK
AT+CCLK?
+CCLK: "12/01/27,14:42:39+04"
OK
```

3.14.18. AT#SCFGEXT3 - Socket Configuration Extended 3

This command sets the socket configuration extended parameters for features not included in **#SCFGEXT** command nor in **#SCFGEXT2** command.

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

 **AT#SCFGEXT3=<connId>,<immRsp>[,<closureTypeCmdModeEnabling>[,<fastSRING>[,<lingerTime>[,<UDPSocketMode>]]]]**

Parameters:

Name	Type	Default	Description
<connId>	integer	N/A	socket connection identifier
	Value:		
	1÷6	:	socket connection identifier value
<immRsp>	integer	0	enables #SD command mode immediate response
	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
		Values:	
		0	: disabled
		1	: enabled
<fastSRING>	integer	0	it has no effect and is included only for backward compatibility
		Values:	
		0	: disabled
		1	: enabled
<lingerTime>	integer	1	Defines the time (in seconds) that the connection will not return until all queued messages for the socket have been successfully sent or the linger timeout has been reached.
		Value:	
		1÷120	: linger time in seconds
<UDPSocketMode>	integer	1	Defines the socket mode of operation WRT the remote socket. Parameter is saved in NVM
		Values:	

- 1 : DL will accept any remote IP and PORT, UL for specified IP and port only.
- 2 : DL will accept any remote IP and PORT, UL changes the remote IP and PORT to the last used (received/ sent) IP and port.
- 3 : Connected mode– DL and UL for specified IP and port only.

AT#SCFGEXT3?

Read command returns the current socket extended configuration parameters values for all the six sockets, in the format:

```
#SCFGEXT3: <connId1>, <immRsp1>, <closureTypeCmdModeEnabling1>,
<fastsring1>, <lingerTime1>, <UDPSocketMode1> <CR> <LF>
```

...

```
#SCFGEXT3: <connId6>, <immRsp6>, <closureTypeCmdModeEnabling6>,
<fastsring6>, <lingerTime6>, <UDPSocketMode6> <CR> <LF>
```

AT#SCFGEXT3=?

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



3.15. FTPEasy

3.15.1. 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



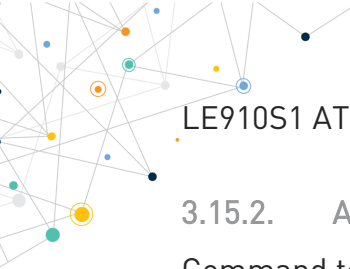
AT#FTPCLOSE

Execution command closes an FTP connection.



AT#FTPCLOSE=?

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



3.15.2. 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.

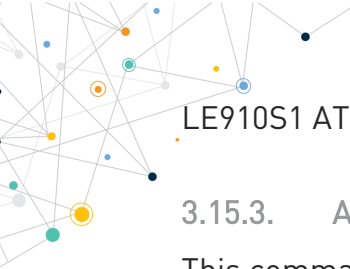
Parameter:

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.



3.15.3. AT#FTPFSIZE - Get File Size from FTP Server

This command returns the size of a file located on a FTP server.

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

AT#FTPFSIZE=<filename>

Execution command, issued during an FTP connection, permits to get the size of a file located on a FTP server. The response format is:

#FTPFSIZE: <size>

Parameter:

Name	Type	Default	Description
<filename>	string	-	the name of the file that you want to know the size

Additional info:

▶▶ Parameter:

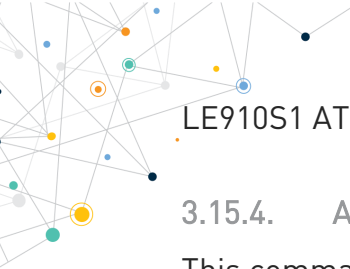
Name	Type	Default	Description
<size>	integer	-	dimension in bytes of the file located on the FTP server

i AT#FTPTYPE=0 command must be issued before #FTPFSIZE command, to set file transfer type to binary mode.

AT#FTPFSIZE=?



Test command returns **OK** result code.



3.15.4. 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.



3.15.5. 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:

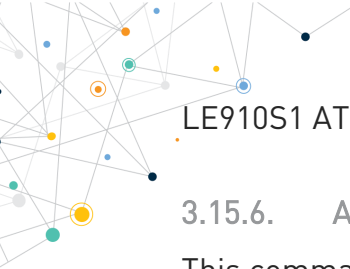
0 : file currently being transferred

1 : complete file has been transferred to FTP client



AT#FTPGETPKT=?

Test command returns **OK** result code.



3.15.6. 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

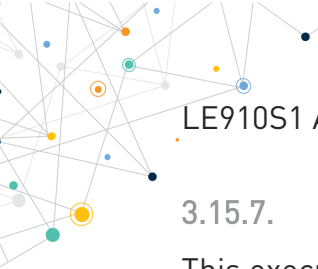
Parameter:

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.



3.15.7. 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)
<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

- Before opening an FTP connection the PDP context (or GSM context) must have been activated by **AT#SGACT=x,1** command. The context identifier "x" is the one used by FTP, as specified in **#PROTOCOLCFG** command.

AT#FTPOPEN=?



Test command returns the **OK** result code

3.15.8. 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 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.

Value:

0 : online 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=?

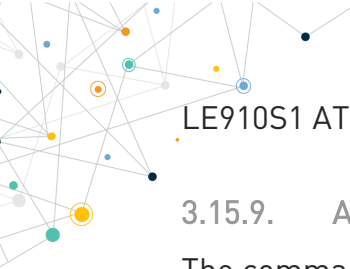
Test command reports the maximum length of <filename> and the supported range of values of <connMode>.



Additional info:

- ▶▶ The format is:
#FTPPUT: <length>, (list of supported <connMode>s)

Name	Type	Default	Description
<length>	integer	-	maximum length of <filename>



3.15.9. 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 * BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB *
```

```
Text row number 12 * CCCCCCCCCCCCCCCCCC
```

```
OK
```

To check when you have received complete file it is possible to use

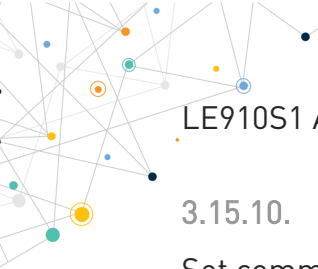
#FTPGETPKT read command:

```
AT#FTPGETPKT?
```

```
#FTPGETPKT:sample.txt,0,1
```

```
OK
```

(you will get **<eof>** set to 1)



3.15.10. 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?

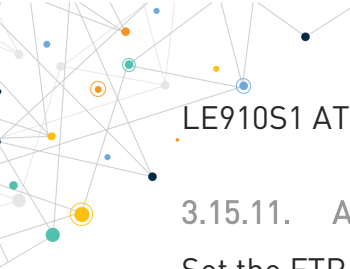
Read command returns the current <restartPosition>:

#FTPREST:<restartPosition>



 **AT#FTPREST=?**

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



3.15.11. 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:

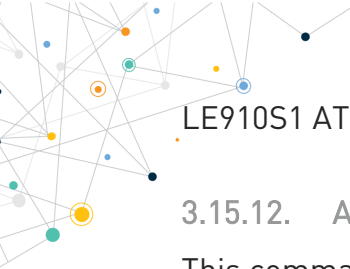
100÷5000 : hundreds of milliseconds

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>.



3.15.12. 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:

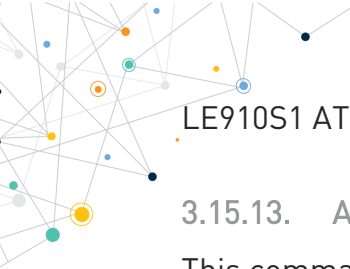
#FTPTYPE: <type>

AT#FTPTYPE=?

Test command returns the range of available values for parameter <type>:

#FTPTYPE: (0,1)





3.15.13. 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
----------	---------	---	-----------------------

Value:


0 : disable FTPS security: all FTP commands will perform plain FTP connections.

<FTPext>	integer	1	PORT/PASV and EPRT/EPSV commands. Option added to pass-through firewall that is unaware of the extended FTP commands for #FTPPUT , #FTPLIST , #FTPAPP , #FTPGET .
-----------------------	---------	---	--

Values:

0 : always use EPRT and EPSV commands

1 : if both module and server ipv4 use PORT and PASV commands

-
-  If parameter **<tout>** is omitted the behavior of set command is the same as read command.



AT#FTPCFG?

Read command reports the currently selected parameters in the format:

#FTPCFG: <tout>,<IPPIgnoring>,<FTPSEn>,<FTPext>



AT#FTPCFG=?

Test command reports the supported range of values for parameter(s): **<tout>**, **<IPPIgnoring>**, **<FTPSEn>**, and **<FTPext>**.



3.16. HTTP

3.16.1. AT#HTTPCFG - Configure HTTP Parameters

This command sets the parameters needed to the HTTP connection.

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

```
➔ AT#HTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout>[,<cid>[,<UNUSED_1>[,<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: - any valid IP address in the format: "xxx.xxx.xxx.xxx" - any host name to be solved with a DNS query. Default: "" for first and second profile "m2mlocate.telit.com" for third profile
<server_port>	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	N/A	PDP context identifier.
	Value:		
		1÷max	: the value of max is returned by the Test Command
<UNUSED_1>	integer	-	parameter for future use. For Modem, an ERROR is issued if <UNUSED_1> and <UNUSED_2> parameters are set with a value different from 0. For WLAN, <UNUSED_1> is considered as <ssl_verify> , to



			enable or disable CA certificate validation. <UNUSED_1> parameter can be set to 0 or 1. <UNUSED_2> parameter can be set only to 0.
<UNUSED_2>	integer	-	parameter for future use. For Modem, an ERROR is issued if <UNUSED_1> and <UNUSED_2> parameters are set with a value different from 0. For WLAN, <UNUSED_1> is considered as <ssl_verify>, to enable or disable CA certificate validation. <UNUSED_1> parameter can be set to 0 or 1. <UNUSED_2> parameter can be set only to 0.

- 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.
- i** For VZW products, default <cid> will be 3. The others will have 1 as default.
- i** HTTP AT command supports the connection for IPv6 Server

AT#HTTPCFG?

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

```
#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,0,0<CR><LF>[<CR><LF>
```

```
#HTTPCFG:<prof_id>,<server_address>,<server_port>,<auth_type>,<username>,<password>,<ssl_enabled>,<timeout>,<cid>,0,0<CR><LF>[...]]
```



? AT#HTTPCFG=?

Test command returns the supported range of parameters **<prof_id>**, **<server_port>**, **<auth_type>**, **<ssl_enabled>**, **<timeout>**, and **<cid>** and the maximum length of **<server_address>**, **<username>** and **<password>** parameters in the format:

HTTPCFG: (list of supported **<prof_id>s**),**<s_length>**,(list of supported **<server_port>s**), (list of supported **<auth_type>s**),**<u_length>**,**<p_length>**,(list of supported **<ssl_enabled>s**),(list of supported **<timeout>s**),(list of supported **<cid>s**)

Additional info:

- ▶▶ Meaning of the **<..._length>** parameters:

Name	Type	Default	Description
<s_length>	integer	-	maximum length of parameter <server_address>
<u_length>	integer	-	maximum length of parameter <username> .
<p_length>	integer	-	maximum length of parameter <password> .

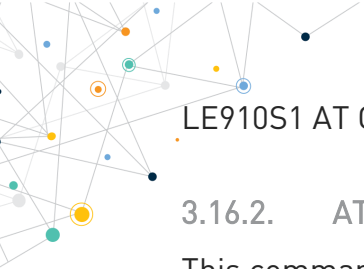


```
AT#HTTPCFG=?  
#HTTPCFG: (0-2),128,(1,65535),(0,1), 128, 128,(0,1),(1-65535),(1-15),(0),(0)
```

OK

```
AT#HTTPCFG=0,47.111.28.211,80,0,123,123,0,125,1  
OK
```

```
AT#HTTPCFG?  
#HTTPCFG: 0,47.111.28.211,80,0,123,123,0,125,1,0,0  
#HTTPCFG: 1,,80,0,,,0,120,1,0,0  
#HTTPCFG: 2,m2mlcate.telit.com,9978,0,,,0,120,1,0,0  
OK
```



3.16.2. 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.
<extra_header_line>	string	-	is the optional HTTP header line.

Additional info:

- When the HTTP server answer is received, then the following URC is put on the serial port:

#HTTPRING:

<prof_id>,<http_status_code>,<content_type>,<data_size>

If there are no data from server or the server does not answer within the time interval specified in **<timeout>** parameter of **#HTTPCFG** command, then the URC **#HTTPRING** **<http_status_code>** parameter has value 0.

Name	Type	Default	Description
<http_status_code>	string	-	is the status code, as received from the server, see RFC 2616
<content_type>	string	-	reports the "Content-Type" header line, as received from the server, see RFC 2616. This field is empty if <http_status_code> has a value out of range (200-206).
<data_size>	string	-	is the byte amount of data received from the server. If the server does not report the "Content-Length:" header line, or <http_status_code> has a value out of range (200-206), the parameter value is 0.

- 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:

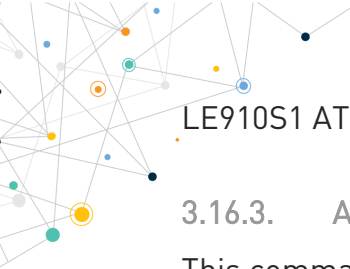
- ▶▶ Meaning of **<..._length>** parameters:

Name	Type	Default	Description
<r_length>	integer	-	maximum length of parameter <resource> .
<m_length>	integer	-	maximum length of parameter <extra_header_line> .

</> **AT#HTTPCFG=0,www.gsctest.top,80,0,123,123,0,125,0,0**
OK

AT#HTTPQRY=0,0,/static/GM510/KFKJ_GM510L1B1_99/update.zip
OK

#HTTPRING: 0,200," application/zip",246496



3.16.3. 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>[,<extra HeaderLine>]]**

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 content	:	free string corresponding to other content type and possible sub-types

<extraHeaderLine>	string	-	optional HTTP header line
--------------------------------	--------	---	---------------------------

Unsolicited fields:

Name	Type	Description
<httpStatusCode>	integer	status code, as received from the server (see RFC 2616)
<contentType>	string	"Content-Type" header line, as received from the server (see RFC 2616). This field is empty if <httpStatusCode> has a value out of range (200-206)



<dataSize>	integer	byte amount of data received from the server. If the server does not report the "Content-Length:" header line or <httpStatusCode> has a value out of range (200-206), the parameter value is 0
-------------------------	---------	---

- 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 <httpStatusCode>** parameter will have value 0.
- i** If sending ends successfully, the response is **OK**; otherwise an error code is reported.

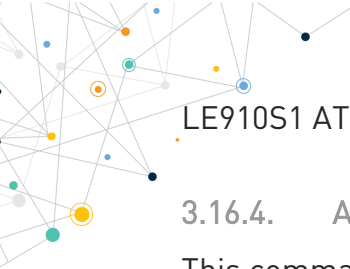
```
</> AT#HTTPCFG=0,www.gsctest.top,80,0,123,123,0,125,0,0
OK

AT#HTTPSEND=0,0,"/",15

>>>(123456789012345)

OK

#HTTPRING: 0,403," text/html",1354
```



3.16.4. AT#HTTTPRCV - 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#HTTTPRCV=<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#HTTPCV=?**

Test command reports the supported range of values for **<proflid>** parameter in the format:

HTTPRCV: (list of supported **<proflid>s**)

```
</> AT#HTTPCFG=0,www.gsctest.top,80,0,123,123,0,125,0,0
OK
AT#HTTPQRY=0,0,/static/GM193/2020_1111.txt
OK
```

#HTTPRING: 0,200," text/plain",17

```
AT#HTTPCV=0
<<<123489641687641
```

3.17. SSL

3.17.1. AT#SSLCFG - Configure General Parameters of a SSL Socket

This command configures SSL connection parameters.

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

➔ **AT#SSLCFG=<SSId>,<cid>,<pktSz>,<maxTo>,<defTo>,<txTo>[,<sslSRingMode>[,<noCarrierMode>[,<skipHostMismatch>[,<UNUSED_4>]]]]**

Set command allows configuring SSL connection parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : Until now SSL block manages only one socket			
<cid>	integer	-	PDP context identifier, see +CGDCONT command.
<pktSz>	integer	0	packet size to be used by the SSL/TCP/IP stack for data sending
Values:			
0 : select automatically default value (300)			
1÷1500 : number of bytes			
<maxTo>	integer	90	exchange timeout or socket inactivity timeout. In online mode, if there is no data exchange within this timeout



period, the connection is closed.

Values:

0 : no timeout

1÷65535 : timeout in seconds

<defTo>

integer 100 timeout that will be used by default whenever the corresponding parameter of each command is not set.

Value:

10÷5000 : timeout in tenth of seconds

<txTo>

integer 50 data sending timeout. In online mode, after this period data are sent also if they are less than max packet size.

Values:

0 : no timeout

1÷255 : timeout value in hundreds of milliseconds

<sslSRingMode>

integer 0 sslSRING unsolicited mode

Values:

0 : SSLSRING disabled

1 : SSLSRING enabled in the format

2 : SSLSRING enabled in the format

<noCarrierMode>

integer 0 permits to choose **NO CARRIER** indication format when the secure socket is closed.

Values:



- 0 : NO CARRIER (Indication is sent as usual, without additional information)
- 1 : NO CARRIER:SSL,<SSId> (Indication of current <SSId> secure socket connection is added. The fixed "SSL" string allows the user to distinguish secure sockets from TCP sockets)
- 2 : NO CARRIER:SSL,<SSId>,<cause> (refer to additional info)

<skipHostMismatch>	integer	1	ignores Host Mismatch alert
---------------------------------	---------	---	-----------------------------

Values:

- 0 : Do not ignore
- 1 : Ignore

<UNUSED_4>	integer	-	Reserved 4
-------------------------	---------	---	------------

Additional info:

►► **<sslSRingMode>** - sslSRing unsolicited mode:

1 - SSLSRING enabled in the format

SSLSRING: <SSId>,<recData>

where <SSId> is the secure socket identifier and <recData> is the amount of data received and decoded by the SSL socket.

A new unsolicited is sent whenever the amount of data ready to be read changes. Only a record is decoded at once so, any further record is received and decoded only after the first have been read by the user by means of the **#SSLRCV** command.

2 - SSLSRING enabled in the format

SSLSRING: <SSId>,<dataLen>,<data>

where <SSId> is the secure socket identifier, <dataLen> is the length of the current chunk of data (the minimum value between the available bytes and 1300) and <data> is data received (<dataLen> bytes) displayed in ASCII format.

- **<noCarrierMode>** - this parameter permits to choose NO CARRIER indication format when the secure socket is closed as follows:

NO CARRIER:SSL,<SSId>,<cause>

Indication of current <SSId> secure socket connection and closure <cause> are added.

Following the possible <cause> values are listed:

0 - not available (secure socket has not yet been closed)

1 - the remote TCP connection has been closed (RST, or any fatal error in send/receive are all included within this case)

2 - socket inactivity timeout

3 - network deactivation (PDP context deactivation from network)

4 - SSL "Close Notify Alert" message has been received

5 - the remote TCP connection has been closed (FIN) after all data have been retrieved from socket

6 - Closure due to any other SSL alert different from the previous ones.

- i** These parameters cannot be changed if the secure socket is connected.

AT#SSLCFG?

Read command reports the parameters current values in the format:

#SSLCFG:

<SSId>,<cid>,<pktSz>,<maxTo>,<defTo><txTo>,<sslSRingMode>,<noCarrierMode>,<skipHostMismatch>,0

AT#SSLCFG=?

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

#SSLCFG: (1),(1-16),(0-1500),(0-65535),(10-5000),(0-255),(0-2),(0-2),(0-1),(0)



3.17.2. AT#SSLSECCFG - Configure Security Parameters of a SSL Socket

Configure security parameters of a SSL socket

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

AT#SSLSECCFG=<SSId>,<CipherSuite>,<auth_mode>[,<cert_format>]

This command allows configuring SSL connection parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : Until now only one SSL socket is available			

<CipherSuite> integer 0 Cipher Suite.

Values:

- 0 : Cipher Suite is chosen by remote Server.
- 1 : TLS_RSA_WITH_AES_128_CBC_SHA
- 2 : TLS_RSA_WITH_AES_256_CBC_SHA
- 3 : TLS_RSA_WITH_AES_128_CBC_SHA256
- 4 : TLS_RSA_WITH_AES_256_CBC_SHA256
- 5 : TLS_RSA_WITH_3DES_EDE_CBC_SHA
- 6 : TLS_RSA_WITH_AES_128_GCM_SHA256
- 7 : TLS_RSA_WITH_AES_256_GCM_SHA384
- 8 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA



-
- 9 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA
 - 10 : TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA
 - 11 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
 - 12 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
 - 13 : TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
 - 14 : TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
-

<auth_mode> integer 0 authentication mode

Values:

- 0 : SSL Verify None
 - 1 : Manage server authentication
 - 2 : Manage server and client authentication if requested by the remote server
-



<cert_format> integer 1 Selects the format of the certificate to be stored via **#SSLSECDATA** command

Values:

- 0 : DER format
 - 1 : PEM format
-

i Assume that the module is just powered on and the **#SSLSECCFG** command is entered without **<cert_format>** parameter, the default format is PEM. In this case the **#SSLSECCFG?** read command does not return the setting of the format in order to meet backward compatibility with other families. Now, let's assume that **#SSLSECCFG** command is entered again, but using the **<cert_format>** parameter for the first time: if the read command is entered, it reports the parameter value just used. If subsequently the **<cert_format>** is omitted, the **#SSLSECCFG?** read command reports the parameter value entered the last time.

⚠ Server CA certificate must be stored through **#SSLSECDATA**.

-  If secure socket is not enabled using **#SSLEN** command, only test command can be used. Read command can be issued if at least a **<SSId>** is enabled.
-  If **<auth_mode>** is different from 0, the module uses its internal time and date to validate the certificate validity period.
If time and date are incorrectly set, the certificate validation may fail.
For additional information refer to **AT+CCLK**, **AT#NITZ** or **AT#NTP**.



AT#SSLSECCFG?

Read command reports the currently selected parameters in the format:

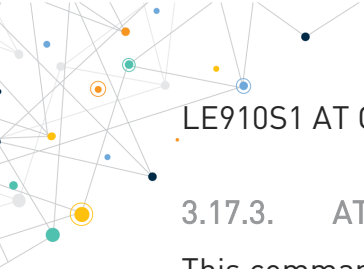
#SSLSECCFG: <SSId>,<CipherSuite>,<auth_mode>[,<cert_format>]



AT#SSLSECCFG=?

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

#SSLSECCFG: (1),(0-10),(0-2),(0,1)



3.17.3. AT#SSLEN - Enable a SSL Socket



This command activates/deactivates a socket secured by SSL.

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

AT#SSLEN=<SSId>,<Enable>

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : only one socket is available			
<Enable>	integer	0	activate/deactivate secure socket
Values:			
0 : deactivate			
1 : activate			

-  If the unique available secure socket is not activated, all the commands - belonging to the SSL set (example: **#SSLSECDATA**, **#SSL...**, etc.) and different from test commands - return an error message. **#SSLS** command is an exception, it can be issued also if the socket is deactivated.
-  If the unique available secure socket is connected, it cannot be deactivated issuing **AT#SSLEN=1,0**.

AT#SSLEN?

Read command reports the current status of secure socket in the format:



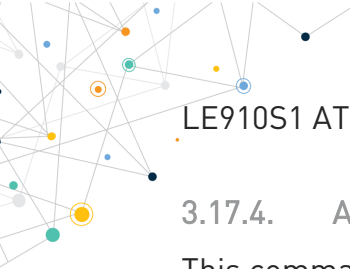
#SSLEN: <SSId>,<Enable>
OK



AT#SSLEN=?

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

#SSLEN: (1),(0,1)



3.17.4. AT#SSLD - Open a SSL Socket to a Remote Server

This command opens a remote connection via socket secured through SSL.

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

 **AT#SSLD=<SSId>,<rPort>,<IPAddress>,<ClosureType>[,<connMode>[,<Timeout>]]**

Execution command opens a remote connection via socket secured through SSL. Both command and online modes can be used.

In the first case 'OK' is printed on success, and data exchange can be performed by means of **#SSLSEND** and **#SSLRECV** commands.

In online mode 'CONNECT' message is printed, and data can be sent/received directly to/by the serial port. Communication can be suspended by issuing the escape sequence (by default **+++**) and restored with **#SSLO** command.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
		Value:	
		1	: Until now only one SSL socket is available
<rPort>	integer	1	Remote TCP port to contact
		Value:	
		1÷65535	: TCP port number
<IPAddress>	string	-	address of SSL server.
			This parameter can be either:
			- 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.xx
x.xxx.xxx.xxx"

<ClosureType> integer 0 Closure type

Value:

0 : Until now only closure type 0 is supported

<connMode> integer 1 connection mode

Values:

0 : online mode connection

1 : command mode connection

<Timeout> integer 100 time-out in 100 ms units. It represents the maximum allowed TCP inter-packet delay. It means that, when more data is expected during the handshake, the module awaits <Timeout> * 100 msec for the next packet.

If no more data can be read, the module gives up the handshake and raises an **ERROR** response

Value:

10÷5000 : hundreds of ms

- i** If secure socket is not enabled using **#SSLEN** only test requests can be made.
 - i** If timeout is not set for SSL connection the default timeout value, set by **#SSLCFG**, is used.
 - i** In online mode the socket is closed after an inactivity period (configurable with **#SSLCFG**, with a default value of 90 seconds), and the **NO CARRIER** message is printed.
-

- i** In online mode data are transmitted as soon as the data packet size is reached or as after a transmission timeout. Both these parameters are configurable by using **#SSLCFG**.
- 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 **#SSLD** has been issued with **<connMode>** set to command mode connection), these data are buffered and we receive the **SSLSRING** URC (if any of its presentation formats have been enabled by means the **#SSLCFG** command); it is possible to read these data afterwards issuing **#SSLRECV**. Under the same hypotheses it is possible to send data while in command mode issuing **#SLSSEND**.
- i** Before opening a SSL connection, the PDP context must have been activated by **#SGACT=x,1**
- i** Before opening a SSL connection, make sure to have stored the needed secure data (CA certificate), using **AT#SSLSECDATA**.
- i** This module can be supported from at least 2048 bits of Server certificate for Public key length.

? AT#SSLD=?

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

#SSLD: (1),(1-65535),,(0),(0,1),(10-5000)

3.17.5. AT#SSLO - Restore a SSL Socket after a +++

This command restores a SSL connection (online mode) suspended by an escape sequence (+++).

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



AT#SSLO=<SSId>




This command restores a SSL connection (online mode) suspended by an escape sequence (+++). After the connection restore, the **CONNECT** message is printed. Please note that this is possible even if the connection has been started in command mode (**#SSLD** with **<connMode>=1**).

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier

Value:

1 : only one socket is available.

-  If secure socket has not be enabled through **#SSLEN** command, only test command can be used.
-  Before opening a SSL connection, the PDP context must have been activated by **AT#SGACT=X,1**.
-  If an error occurs during reconnection the socket cannot be reconnected, then a new connection has to be done.



AT#SSLO=?

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



#SSLO: (1)

3.17.6. AT#SSLH - Close a SSL Socket

This command allows closing the SSL connection.

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


AT#SSLH=<SSId>[,<ClosureType>]

Parameters:

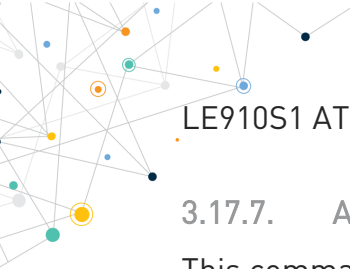
Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : only one socket is available			
<ClosureType>	integer	0	type of socket closure.
Value:			
0 : only value 0 is supported			

- ⚠ If secure socket has not be enabled through **#SSLEN** command, only test command can be used.


AT#SSLH=?

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

#SSLH: (1),(0)



3.17.7. AT#SSLSEND - Send Data through a SSL Socket

This command allows sending data through a secure socket.

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

AT#SSLSEND=<SSId>[,<Timeout>]

The device responds to the command with the prompt '>' and waits for the data to send.




To complete the operation send **Ctrl-Z** char (0x1A hex); to exit without writing the message send **ESC** char (0x1B hex).


If data are successfully sent, then the response is **OK**.

If data sending fails for some reason, an error code is reported.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : only one socket is available			
<Timeout>	integer	100	Socket send timeout
Value:			
10÷5000 : timeout in 100 ms units			

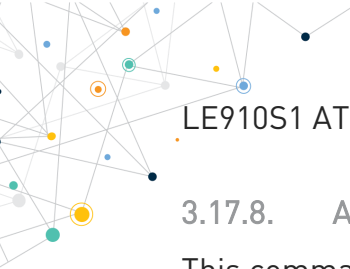
-  The maximum number of bytes to send is 1023; trying to send more data will cause the surplus to be discarded and lost
-  If secure socket is not enabled using **AT#SSLEN** only test requests can be made.
-  If timeout is not set for SSL connection the default timeout value, set by **AT#SSLCFG**, is used.

-
-  Before sending data through the SSL connection it has to be established using **AT#SSLD**
-

AT#SSLSEND=?

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

#SSLSEND: (1),(10-5000)



3.17.8. AT#SSLRECV - Read Data from a SSL Socket

This command reads data from a SSL socket.

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

AT#SSLRECV=<SSId>,<MaxNumByte>[,<Timeout>]

Set command allows to receive data, arrived through a connected secure socket. Data has been buffered and not read yet.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	secure socket identifier
Value:			
1 : until now only one SSL socket is supported			
<MaxNumByte>	integer	N/A	maximum number of bytes to read
Value:			
1÷1000 : maximum number of bytes to read			
<Timeout>	integer	100	time-out in 100 ms units
Value:			
1÷5000 : hundreds of ms			

Additional info:

- ▶▶ If data are received, the device responds:

```
#SSLRECV: NumByteRead
...(Data read)...
OK
```




- ▶▶ If no data are received, the device responds:

```
#SSLRCV: 0  
TIMEOUT  
OK
```

- ▶▶ If the remote host closes the connection, the device responds:

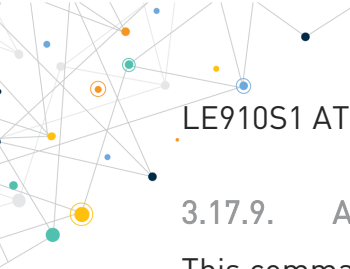
```
#SSLRCV: 0  
DISCONNECTED  
OK
```

- ❗ If secure socket is not enabled using **AT#SSLEN**, only test requests can be made.
- ❗ If timeout is not set for SSL connection, the default timeout value, set through **AT#SSLCFG**, is used.
- ❗ Before receiving data from the SSL connection, it has to be established using **AT#SSLD**.

AT#SSLRCV=?

The test command returns the ranges of the parameters values in the form:

```
#SSLRCV: (1),(1-1000),(1-5000)
```



3.17.9. AT#SSLS - Report the Status of a SSL Socket

This command reports the status of secure sockets.

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

AT#SSLS=<SSId>

The command reports the status of secure sockets. The response message of the command can have the following formats:

if secure socket is connected, the format is:

#SSLS: <SSId>,<ConnectionStatus>,<CipherSuite>

otherwise:

#SSLS: <SSId>,<ConnectionStatus>

The response messages parameters are described in the Additional info section.

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier.

Value:

1 : only one SSL socket is supported

Additional info:

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

Name	Type	Default	Description
<CipherSuite>	integer	0	Cipher Suite identifier



Values:

- 0 : Chipper Suite is chosen by remote Server
- 1 : TLS_RSA_WITH_3DES_EDE_CBC_SHA
- 2 : TLS_RSA_WITH_AES_128_CBC_SHA
- 3 : TLS_RSA_WITH_AES_128_CBC_SHA256
- 4 : TLS_RSA_WITH_AES_256_CBC_SHA
- 5 : TLS_RSA_WITH_AES_256_CBC_SHA256
- 6 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA
- 7 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA
- 8 : TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA
- 9 : TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
- 10 : TLS_DHE_RSA_WITH_AES_256_CBC_SHA256

<ConnectionStatus>	integer	N/A	Connection Status identifier
---------------------------------	---------	-----	------------------------------

Values:

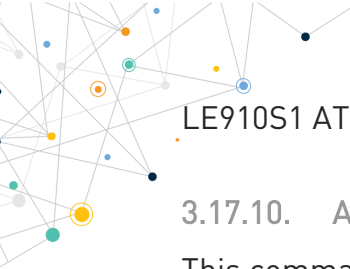
- 0 : socket disabled
- 1 : connection closed
- 2 : connection open

 This command can be issued even if the **<SSId>** is not enabled.

AT#SSLS=?

Test command returns the ranges of the parameters values in format:

#SSLS: {1}



3.17.10. AT#SSLI - Secure Socket Info

This command is used to get information about secure socket data traffic.

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

AT#SSLI[=<SSId>]

Execution command is used to get information about secure socket data traffic.

The response is in the format:

#SSLI:

<SSId>,<DataSent>,<DataRecv>,<PendingData>,<TCPConnWaitingAck>

Parameter:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier

Value:

1 : only one SSL socket is available

Additional info:

- ▶▶ Parameters returned by the response message and not described in the previous sections.

Name	Type	Default	Description
<DataSent>	integer	-	total amount (in bytes) of data sent to the TLS/SSL connection since the beginning of the connection itself (obviously: not yet



			encoded into TLS/SSL record)
<DataRecv>	integer	-	total number of bytes received from the TLS/SSL connection since the beginning of the connection itself (obviously: already decoded from TLS/SSL record)
<PendingData>	integer	-	number of bytes available to be read from the TLS/SSL record that is currently being processed (obviously: already decoded from TLS/SSL record)
<TCPConnWaitingAck>	integer	N/A	indication of the underlying TCP socket condition, if there are TCP/IP packets sent but not yet acknowledged or not

Values:

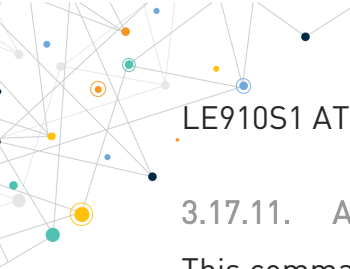
- 0 : no TCP/IP packets sent waiting for ack
- 1 : TCP/IP packets sent waiting for ack



AT#SSLI=?

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

#SSLI: (1)



3.17.11. AT#SSLSENDEXT - Send Data through a SSL Socket in Command Mode

This command sends data through a secure socket.

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

AT#SSLSENDEXT=<SSId>,<bytestosend>[,<Timeout>]

This command allows sending data through a secure socket.

The device responds to the command with the prompt '>'

<greater_than><space> and waits for the data to send.

When <bytestosend> bytes have been sent, operation is automatically completed.

If data are successfully sent, then the response is **OK**.

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

Parameters:

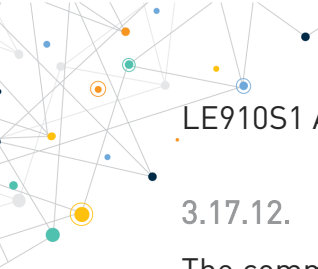
Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier
Value:			
1 : only one SSL socket is available.			
<bytestosend>	string	-	number of bytes to be sent. Refer to test command for range
<Timeout>	integer	100	time-out in 100 ms units.
Value:			
10÷1500 : hundreds of ms.			

- If secure socket has not be enabled through **#SSLEN** command, only test command can be used.

- i** If timeout is not set for SSL connection, is used the timeout value set by **#SSLCFG**.
- i** Before sending data through the SSL connection, it must be established using **#SSLD**.
- i** All special characters are sent like a generic byte. (For instance: 0x08 is simply sent through the socket and does not behave like a BackSpace, i.e. previous character is not deleted)

?  AT#SSLSENDEXT=?

Test command returns the range of supported values for parameters
#SSLSENDEXT: (1),(1-1024),(10-5000)



3.17.12. AT#SSLSECDATA - Manage the Security Data

The command stores, reads, and deletes security data (Certificate, CA certificate, private key) in / from NVM.

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



AT#SSLSECDATA=<SSId>,<Action>,<DataType>[,<Size>[,<Password>]]

This command allows to store, delete and read security data.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
Value:			
1 : Until now SSL block manages only one socket			
<Action>	integer	N/A	Action to do
Values:			
0 : delete data from NVM			
1 : store data in NVM			
2 : read data from NVM			
<DataType>	integer	N/A	security data type
Values:			
0 : certificate			
1 : CA certificate			
2 : RSA Private key			
<Size>	integer	N/A	Size of security data to be stored



Values:

1÷4096 : for Certificate and RSA Private key

1÷12228 : for CA certificate

<Password>	string	-	it allows to read RSA key when validated. The max length of this value is 10. Only 1..9 / a..z / A..Z characters are allowed. Default is the empty string "".
-------------------------	--------	---	--

Additional info:

- ▶▶ If the **<Action>** parameter is 1 (store data into NVM) the device responds to the command with the prompt '>' and waits for the data to store.

- i** Secured data have to be in PEM or in DER format, depending on `<cert_format>` chosen with `#SSLSECCFG`.

If no `<cert_format>` has been specified with `#SSLSECCFG`, PEM format is assumed.

PEM format (see `#SSLSECCFG` command): To complete the operation send **Ctrl-Z** char (0x1A hex); to exit without writing the message send **ESC** char (0x1B hex).

DER format (see `#SSLSECCFG` command): When `<size>` bytes are entered, the certificate is automatically stored.

ESC or **Ctrl-Z** don't take effect, because they are considered as possible octets contained in the certificate.

If data are successfully stored, then the response is **OK**; if it fails for some reason, an error code is reported.



If the `<Action>` parameter is 2 (read data from NVM), data specified by `<DataType>` parameter is shown in the following format:

```
#SSLSECDATA: <connId>,<DataType>  
<DATA>  
OK
```

If `<DataType>` data has not been stored (or it has been deleted) the response has the following format:

```
#SSLSECDATA: <connId>,<DataType>  
No data stored  
OK
```

- i** `<size>` parameter is mandatory if the `<write>` action is issued, but it has to be omitted if `<delete>` or `<read>` actions are issued.
- i** If secure socket is not enabled using `AT#SSLEN` only test requests can be made.
- i** If socket is connected an error code is reported.
- i** Once the `<Password>` saved, changing password is not allowed. To reset `<Password>`, it can be used `AT#SSLSECDATA=1,0,2`.

-  Maximum **<size>** for Certificate/ RSA Private key is 4096 bytes. Only CA Certificate can support up to 12228 bytes in case of PEM format.
If CA Certificate has a format to DER, it can be limited as 4096 bytes too.
The CA certificate chain can store 1 Root CA and up to 2 Intermediate CA and it is saved in NVM memory.
-  This module can support PKCS 1 type of RSA Private key.



AT#SSLSECDATA?

Read command reports what security data are stored in the format:

#SSLSECDATA: <CertId>,<CertIsSet>,<CACertIsSet>,<PrivKeysSet>

<CertIsSet>, **<CACertIsSet>**, **<PrivKeysSet>** are 1 if related data are stored into NVM otherwise 0.



AT#SSLSECDATA=?

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

#SSLSECDATA: (1),(0-2),(0,2),(1-4096),(10)

#SSLSECDATA: (1),(0-2),(1),(1-12228),(10)



3.17.13. AT#SSLSECDATAEXT - Manage the security data extended

Manage the security data extended

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

 **AT#SSLSECDATAEXT=<SSId>,<Action>,<DataType>,<Index>[,<Size>]**

This command allows to store, delete , read and select security data (CA certificate) into NVM.

Parameters:

Name	Type	Default	Description
<SSId>	integer	1	Secure Socket Identifier
		Value:	
		1	: Until now SSL block manages only one socket
<Action>	integer	N/A	Action to do
		Values:	
		0	: Delete data from NVM
		1	: Store data into NVM
		2	: Read data from NVM
		3	: Select data from NVM
<DataType>	integer	N/A	Type of Data
		Value:	
		1	: CA Certificate
<Index>	integer	N/A	Order to be saved



Value:

1÷3 : Supported index range

<Size>	integer	N/A	Size of security data to be stored
---------------------	---------	-----	------------------------------------

Value:

1÷4096 : Supported data length

- i** If the **<Action>** parameter is 1 (store data into NVM) the device responds to the command with the prompt '**>**' and waits for the data to store.

- i** Secured data have to be in PEM or in DER format, depending on **<cert_format>** chosen with **#SSLSECCFG**.
 If no **<cert_format>** has been specified with **#SSLSECCFG**, PEM format is assumed.
 PEM format (see **#SSLSECCFG** command): to complete the operation send **Ctrl-Z** char (0x1A hex); to exit without writing the message send **ESC** char (0x1B hex).
 DER format (see **#SSLSECCFG** command): when **<Size>** bytes are entered, the certificate is automatically stored. **ESC** or **Ctrl-Z** do not take effect, because they are considered as possible octets contained in the certificate.

If data are successfully stored, then the response is **OK**; if it fails for some reason, an error code is reported.

If the **<Action>** parameter is 2 (read data from NVM), data specified by **<DataType>**, **<Index>** parameters is shown in the following format:

```
#SSLSECDATAEXT: <connId>,<DataType>,<Index>
<DATA>
OK
```

If **<DataType>**, **<Index>** data has not been stored (or it has been deleted) the response has the following format:

#SSLSECDATAEXT: <connId>,<DataType>,<Index>

No data stored

OK

- i** <Size> parameter is mandatory if the <write> action is issued, but it has to be omitted when <delete> or <read> or <select> actions are issued.
- i** If secure socket is not enabled using **AT#SSLEN** only test requests can be made.
- i** If socket is connected an error code is reported.
- i** Maximum supported number of CA certificate is up to 3.
- i** To use for H/S procedure, you need to choose <Action> to 3 ("Select data from NVM").
- i** No chained CA certificates are supported.



AT#SSLSECDATAEXT?

Read command reports what security data are stored in the format:

#SSLSECDATAEXT:

<SSId>,<SelectedIndex>,<CAcert1Set>,<CAcert2Set>,<CAcert3Set>

where

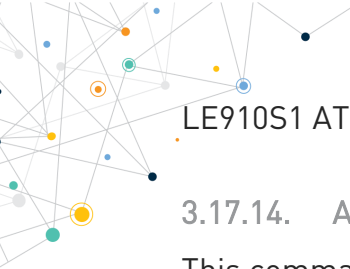
<SelectedIndex>,<CAcert1Set>,<CAcert2Set> and **<CAcert3Set>** are 1 if related data are stored into NVM, 0 otherwise.



AT#SSLSECDATAEXT=?

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


#SSLSECDATAEXT: (1),(0-3),(1),(1-3),(1-4096)



3.17.14. AT#SSLSECCFG2 - Configure Additional Parameters of a SSL Socket

This command allows configuring additional SSL security parameters.


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

 **AT#SSLSECCFG2=<SSId>,<version>[,<unused_A>[,<unused_B>[,<unused_C>[,<unused_D>]]]]**

This command allows configuring additional SSL security parameters.

Parameters:

Name	Type	Default	Description
<SSId>	integer	N/A	Secure Socket Identifier
Value:			
1 : only one SSL socket is available			
<version>	integer	2	SSL/TLS protocol version
Values:			
0 : protocol version TLSv1.0			
1 : protocol version TLSv1.1			
2 : protocol version TLSv1.2			
<unused_A>	integer	-	reserved for future implementations
<unused_B>	integer	-	reserved for future implementations
<unused_C>	integer	-	reserved for future implementations
<unused_D>	integer	-	reserved for future implementations

-  If secure socket has not be enabled through **#SSLEN** command, only test command can be used.

 **AT#SSLSECCFG2?**

Read command reports the currently selected parameters in the format:

```
#SSLSECCFG2: <SSId>,<version>,0,0,0,0
```

 **AT#SSLSECCFG2=?**

Test command reports the range of supported values for all the parameters

```
#SSLSECCFG2: (1),(0-2),(0),(0),(0),(0)
```




3.18. FOTA & OMA

3.18.1. FOTA Legacy

3.18.1.1. AT#OTAUPW - OTA Delta Write

Execution command starts injection of a delta file into the device.



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



AT#OTAUPW=<size>

Parameter:

Name	Type	Default	Description
<size>	integer	-	size in bytes of data to be injected

-  Send escape sequence +++ to end data transmission (which will result in **OK** response).
-  If <size> parameter value was specified, the command will report **OK** once all size is received.



AT#OTAUPW=?

Test command returns **OK** result code.



```
// Send the command #OTAUPW to start the injection of the Delta  
// FW into module's flash memory
```

AT#OTAUPW CONNECT

```
// Send the Delta FW to the module via user's USB / SERIAL  
// interface.
```

```
// remind to use hardware flow control while sending the file  
// Once the sending of the file has been terminated, close the  
// connection through the escape sequence (+++).
```

```
+++
```

```
OK
```



3.19. GNSS

3.19.1. GNSS Configuration

3.19.1.1. AT\$GPSCFG - Set GNSS Configuration Parameters

This command sets the GNSS constellation

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

AT\$GPSCFG=<parameter>,<value>

Parameters:

Name	Type	Default	Description
<parameter>	integer	N/A	selects the configuration parameter to be set

Values:

- 0 : reserved
- 1 : reserved
- 2 : set constellation
- 3 : reserved
- 4 : reserved

<value>	integer	-	value depends on the first parameter. See Additional info section.
---------	---------	---	--

Additional info:

- ▶▶ <parameter>=2, in this case the <value> assumes the meaning of <constellation>.

Name	Type	Default	Description
<constellation>	integer	5	selects the constellation

Values:

- 0 : reserved
- 1 : reserved
- 2 : reserved
- 3 : reserved
- 4 : GPS+QZSS
- 5 : GPS+GLONASS+GALILEO+QZSS
- 6 : GPS+BDS+GALILEO+QZSS



AT\$GPSCFG?

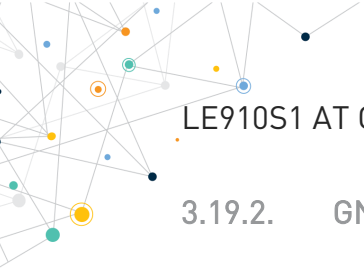
Read command returns current values of <reserved>, <reserved>, <constellation>, <reserved> and <reserved> in format:

\$GPSCFG: <reserved>,<reserved>,<constellation>,<reserved>, <reserved>



AT\$GPSCFG=?

Test command returns supported values range of <parameter>,<reserved>, <reserved>, <constellation>, <reserved> and <reserved>



3.19.2. GNSS Receiver

3.19.2.1. AT\$GPSP - GNSS Controller Power Management

This command powers on/off GNSS controller .

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



AT\$GPSP=<status>

The set command manages the power-up/power-down of the GNSS controller.

Parameter:

Name	Type	Default	Description
<status>	string	0	indicates the power status that has to be set.

Values:

- 0 : GNSS controller is powered down
- 1 : GNSS controller is powered up

- i** Power up clears GPS memory and then starts the GPS receiver. GPS data cleaning is performed on the base of the current value of the <reset_type> parameter (see \$GPSR).
- i** GPS operation mode is performed on the base of the current values of \$GPSSLR configuration (see \$GPSSLR).
- i** <status> value is stored through \$GPSSAV command.



AT\$GPSP?




The read command reports the current value of the **<status>** parameter, in the format:

\$GPSP: <status>

 **AT\$GPSP=?**

The test command reports the supported values range for parameter **<status>**.

 GNSS controller is powered down
AT\$GPSP=0
OK

3.19.3. GNSS General Management

3.19.3.1. AT\$GPSSW - GNSS Software Version


This command provides the GNSS module software version.

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

AT\$GPSSW

Execution command returns the GNSS module software version in the format:

\$GPSSW: <swVersion>

-  The command is available in "controlled mode" only, see **\$GPSPD** command.

GNSS module software version is available in few seconds at first GNSS module startup

AT\$GPSSW?

Read command has the same behavior as the execution command.

AT\$GPSSW=?

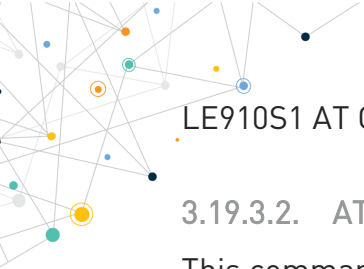
Test command returns the **OK** result code



AT\$GPSSW

\$GPSSW: R3.4.0.0Build7258

OK



3.19.3.2. AT\$GPSR - Reset the GPS Controller

This command resets the GNSS controller.

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

AT\$GPSR=<resetType>

Execution command allows to reset the GNSS controller.




Parameter:

Name	Type	Default	Description
<resetType>	integer	3	set the type of GNSS controller reset.

Values:

- 0 : Factory Reset: this option clears all the GNSS memory including Clock Drift.
- 1 : Coldstart (No Almanac, No Ephemeris): this option clears all data that is currently stored in the internal memory of the GNSS receiver including Position, Almanac, Ephemeris and Time. The stored Clock Drift is retained.
- 2 : Warmstart (No ephemeris): this option clears all initialization data in the GNSS receiver and subsequently reloads the data that is currently displayed in the Receiver Initialization Setup screen. The Almanac is retained but the Ephemeris is cleared.
- 3 : Hotstart (with stored Almanac and Ephemeris): the GNSS receiver restarts by using all data that is currently stored in the internal memory of the

GNSS receiver: validated Ephemeris and Almanac.

-  **Factory Reset** performs the same operation as **Coldstart**.
-  `<reset_type>` sets the kind of start when GNSS is activated through `$GPSP` or `$GPSSLR` commands.
-  The current setting is stored through `$GPSSAV` command.



AT\$GPSR?

Read command displays the current `<reset_type>` value.



AT\$GPSR=?

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



```
Factory reset
AT$GPSR=0
OK
```

3.19.4. GNSS Positioning Information

3.19.4.1. AT\$GPSNMUN - Unsolicited NMEA Data Configuration

Unsolicited NMEA Data Configuration



[1] NMEA 0183 Standard

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


AT\$GPSNMUN=<enable>[,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG>]

Set command permits to activate an Unsolicited streaming of GPS data (in NMEA format) through the standard GSM serial port and defines which NMEA sentences will be available.

Parameters:

Name	Type	Default	Description
<enable>	integer	0	Enables unsolicited GNSS data stream and selects one of the available GNSS data stream format display. See Additional info section to have information on GNSS data stream formats.

Values:

- 0 : NMEA data stream de-activated
- 1 : enable the first GNSS data stream format
- 2 : enable the second GNSS data stream format
- 3 : Dedicated NMEA data stream



<GGA>	integer	0	enables/disables the presence of the Global Positioning System Fix Data NMEA sentence (GGA) in the GNSS data stream.
Values:			
0 : disable			
1 : enable			
<hr/>			
<GLL>	integer	0	enable/disable the presence of the Geographic Position - Latitude/Longitude NMEA sentence (GLL) in the GNSS data stream.
Values:			
0 : disable			
1 : enable			
<hr/>			
<GSA>	integer	0	enable/disable the presence of the GNSS DOP and Active Satellites NMEA sentence (GSA) in the GNSS data stream.
Values:			
0 : disable			
1 : enable			
<hr/>			
<GSV>	integer	0	enable/disable the presence of the Satellites in View NMEA sentence (GSV) in the GNSS data stream.
Values:			
0 : disable			
1 : enable			
<hr/>			
<RMC>	integer	0	enable/disable the presence of the Recommended Minimum Specific GNSS Data NMEA sentence (RMC) in the GNSS data stream.
Values:			



0 : disable

1 : enable

<VTG>	integer	0	enable/disable the presence of the GNSS Course Over Ground and Ground Speed NMEA sentence (VTG) in the GNSS data stream.
--------------------	---------	---	--

Values:

0 : disable

1 : enable

Additional info:

▶▶ **<enable>=1**, GNSS data stream format:

\$GPGSNMUN: <NMEA SENTENCE 1><CR><LF>

...

\$GPGSNMUN: <NMEA SENTENCE N><CR><LF>

...

▶▶ **<enable>=2**, GNSS data stream format:

<NMEA SENTENCE 1><CR><LF>

...

<NMEA SENTENCE N><CR><LF>

...

▶▶ **<enable>=3**, in this case, the AT interface port is dedicated to NMEA sentences, it is not possible to send AT commands. Use the escape sequence "+++" to return in command mode. GNSS data stream format:

<NMEA SENTENCE 1><CR><LF>

...

<NMEA SENTENCE N><CR><LF>

...

The NMEA data stream format is the same as the one selected by `<enable>=2`.



AT\$GPSNMUN?

Read command returns whether the unsolicited GPS NMEA data streaming is currently enabled or not, along with the NMEA sentences availability status, in the format:

`$GPSNMUN:<enable>,<GGA>,<GLL>,<GSA>,<GSV>,<RMC>,<VTG >`



AT\$GPSNMUN=?

Test command returns the supported range of values for parameters: `<enable>`, `<GGA>`, `<GLL>`, `<GSA>`, `<GSV>`, `<RMC>`, `<VTG>`.



All NMEA data stream is aligned with NMEA 0183 v4.10.



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "No"



`AT$GPSNMUN=1,0,0,1,0,0,0 OK`

These sets the GSA as available sentence in the unsolicited message

`AT$GPSNMUN=0 OK`

Turn-off the unsolicited mode

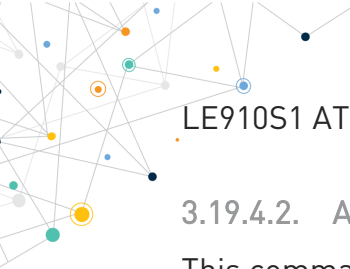
`AT$GPSNMUN?`

`$GPSNMUN: 1,0,0,1,0,0,0 OK`

Give the current frame selected (GSA) The unsolicited message will be:

`$GPSNMUN:`

`$GPGSA,A,3,23,20,24,07,13,04,02,,,,,2.4,1.6,1.8°3C`



3.19.4.2. AT\$GPSACP - Get Acquired Position

This command returns information about the last GPS position.



[1] NMEA 0183 Standard

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



AT\$GPSACP

Execution command returns information about the last GPS position in the format:

\$GPSACP:

<UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat_gps>,<nsat_glonass>

Additional info:

- ▶▶ Meanings of the parameters returned by the command.

Name	Type	Default	Description
<UTC>	string	-	UTC time (hhmmss.sss) referred to GGA sentence
<latitude>	string	-	latitude in the format ddmm.mmmm N/S (referred to GGA sentence) where: dd: 00..90, degrees mm.mmmm: 00.0000..59.9999, minutes N/S: North/South



<longitude>	string	-	longitude in the format dddmm.mmmm E/W (referred to GGA sentence) where: ddd: 000..180, degrees mm.mmmm: 00.0000..59.9999, minutes E/W: East/West
<hdop>	string	-	Horizontal Dilution of Precision (referred to GGA sentence)
<altitude>	string	-	altitude - mean-sea-level (geoid) in meters (referred to GGA sentence)
<fix>	integer	N/A	fix type Values: 0 : invalid fix 1 : invalid fix 2 : 2D fix 3 : 3D fix
<cog>	string	-	Course over Ground (degrees, True) (referred to VTG sentence) in the format ddd.mm where: ddd: 000..360, degrees mm: 00..59, minutes
<spkm>	string	-	speed over ground (Km/hr) (referred to VTG sentence)
<spkn>	string	-	speed over ground (knots) (referred to VTG sentence)
<date>	string	-	date of fix (referred to RMC sentence) in the format ddmmyy



			where: dd: 01..31, day mm: 01..12, month yy: 00..99, year 2000 to 2099
<nsat_gps>	integer	N/A	total number of GPS satellites in use (referred to GGA sentence)
	Value:		
	0÷12 : total number of GPS satellites in use		
<nsat_glonass>	integer	N/A	total number of GLONASS satellites in use
	Value:		
	0÷12 : total number of GLONASS satellites in use		



AT\$GPSACP?

Read command has the same behavior as the Execution command.



AT\$GPSACP=?

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



```
AT$GPSP?  
$GPSP: 0
```

After module is power-up there no aquired position

```
AT$GPSACP  
$GPSACP:  
OK
```

```
AT$GPSP=1 OK
```

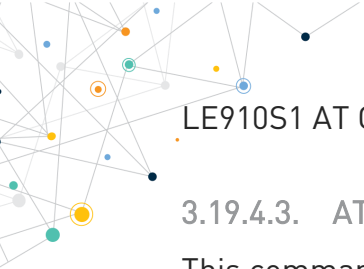
Until first fix is received, the command will display no fix GPS position

```
AT$GPSACP  
$GPSACP: ,,,,1,,,,,
```

Once fix has been received the command will display actual GPS position

```
OK  
AT$GPSACP  
$GPSACP: 3206.4020N,03450.2678E,1.1,3.3,0,0.0,0.0,0.0,030613,06,03
```


```
OK
```



3.19.4.3. AT\$GPSNMUNEX - Unsolicited NMEA Extended Data Configuration

This command permits to activate an unsolicited streaming of GNSS data.

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

 **AT\$GPSNMUNEX=<GNGNS>[,<GNGSA>[,<GLGSV>[,<GPGRS>[,<BDGSA>[,<BDGSV>[,<GAGSA>[,<GAGSV>[,<GPDTM>]]]]]]]]]**

Set command permits to activate an unsolicited streaming of GNSS data (in NMEA extended format) through the NMEA port and defines which NMEA extended sentences will be available.

Parameters:

Name	Type	Default	Description
<GNGNS>	integer	0	Fix data of GNSS receivers
	Value:		
	0	:	disable
<GNGSA>	integer	0	DOP and active satellites of GNSS
	Values:		
	0	:	disable
	1	:	enable
<GLGSV>	integer	0	GLONASS satellites in view
	Values:		
	0	:	disable
	1	:	enable
<GPGRS>	integer	0	GPS Range Residuals
	Value:		



		0	: disable
<BDGSA>	integer	0	Beidou DOP and Active Satellites
	Value:		
		0	: disable

<BDGSV>	integer	0	Beidou Satellites in View
	Values:		
		0	: disable
		1	: enable

<GAGSA>	integer	0	Galileo DOP and Active Satellites
	Value:		
		0	: disable

<GAGSV>	integer	0	Galileo Satellites in View
	Values:		
		0	: disable
		1	: enable

<GPDTM>	integer	0	Datum reference information
	Value:		
		0	: disable

- i** NMEA extended data is displayed on NMEA port depending on **\$GPSNMUN** **<enable>** parameter setting.

AT\$GPSNMUNEX?

Read command returns the NMEA extended sentences availability status, in the format:

\$GPSNMUNEX:

<GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<BDGSA>,<BDGSV>,<GAGSA>,<GAGSV>,<GPDTM>

? AT\$GPSNMUNEX=?

Test command returns the supported range of values for parameters <GNGNS>,<GNGSA>,<GLGSV>,<GPGRS>,<BDGSA>,<BDGSV>,<GAGSA>,<GAGSV> and <GPDTM>.



- i** When GNSS data is being received, there are four consecutive GNGSA sentences. The sentences are arranged at the following order: gps, galileo, glonass, and beidou
- i** All NMEA data stream is aligned with NMEA0183 v4.10.
\$BD--- NMEA data stream (for Beidou)
\$GA--- NMEA data stream (for Galileo)
- i** Galileo satellites are identified by their PRN numbers, ranging 1 to 36
- i** Beidou satellites are identified by their PRN numbers, ranging 1 to 37
- i** GNSS System ID (the last field of \$--GSA) are identified as GPS: 1, GLONASS: 2, GALILEO: 3, BEIDOU: 4.



```
AT$GPSNMUN=1
```

```
OK
```

```
AT$GPSNMUNEX=0,1,0,0,0,0,0,0,0
```

```
OK
```

These sets the GNGSA as available sentence in the unsolicited NMEA sentences.

```
AT$GPSNMUNEX?
```

```
$GPSNMUNEX: 0,1,0,0,0,0,0,0,0
```

```
OK
```

Give the current frame selected (GNGSA)

The unsolicited message will be:

```
$GPSNMUN: $GNGSA,A,3,05,15,23,24,10,12,,,,,,2.61,2.22,1.37,1°07
```

3.20. IMS

3.20.1. AT+CIREG - IMS registration state

This command controls the presentation of an unsolicited result code when there is a change in the MT's IMS registration information.



3GPP TS 24.229

3GPP TS 24.173

3GPP TS 24.341

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



AT+CIREG=[<mode>]

Unsolicited result code has the following format:

+CIREGU: <reg_info>[,<ext_info>]

Parameter:

Name	Type	Default	Description
<mode>	integer	0	enables or disables reporting of changes in the MT's IMS registration information.

Values:

0 : disable reporting

1 : enable reporting (parameter <reg_info>).

2 : enable extended reporting (parameters <reg_info> and <ext_info>).

Unsolicited fields:

Name	Type	Description
<reg_info>	integer	<p>Indicates the IMS registration status. The UE is seen as registered if one or more of its public user identities are registered with any of its contact addresses, see 3GPP TS 24.229</p> <p>Values:</p> <p>0 : not registered.</p> <p>1 : registered.</p>
<ext_info>	integer	<p>hexadecimal format. The value range is from 1 to FFFFFFFF. It is a sum of hexadecimal values, each representing a particular IMS capability of the MT. The MT can have IMS capabilities not covered by the below list. This parameter is not present if the IMS registration status is "not registered".</p> <p>Values:</p> <p>1 : RTP-based transfer of voice according to MMTEL.</p> <p>2 : RTP-based transfer of text according to MMTEL.</p> <p>4 : SMS using IMS functionality.</p> <p>8 : RTP-based transfer of video according to MMTEL.</p>

i Parameter <mode> is saved in profile.

i **AT+CIREG=6**
returns **+CME ERROR: 50**



AT+CIREG?

Read command reports the current state of IMS registration in the format:

+CIREG: <mode>,<reg_info>[,<ext_info>]



AT+CIREG=?

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



ERRATA: Correct value for "Setting saved" column in table at the beginning of command description is "Common profile"

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 contained 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 without any 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.

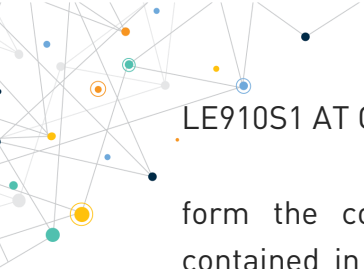
This document may contain references or information about Telit's products (machines and programs), or services that are not announced in your country. Such references or information do not necessarily mean that Telit intends to announce such Telit products, programming, or services in your country.

4.1.1. Copyrights

This instruction manual and the Telit products described herein may include or describe Telit copyrighted material, such as computer programs stored in semiconductor memories or other media. The 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 way without the express written permission of the owner. Furthermore, the purchase of Telit 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 Third-Party supplied Software (SW) products, described in this instruction manual may include Telit's and other Third-Party's copyrighted computer programs stored in semiconductor memories or other media. The laws in Italy and in other countries reserve to Telit and other Third-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 Third-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 Third-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. Third-Party Rights

The software may include Third-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 Third-Party Terms, the disclaimer of warranty and limitation of liability provisions in this License, shall apply to the Third-Party Rights software as well.

TELIT HEREBY DISCLAIMS ANY AND ALL WARRANTIES EXPRESSED OR IMPLIED FROM ANY THIRD-PARTY REGARDING ANY SEPARATE FILES, ANY THIRD-PARTY MATERIALS INCLUDED IN THE SOFTWARE, ANY THIRD-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 THIRD-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

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
13	2022-09-14	<p>Updated commands:</p> <p>AT#CMUXMODE, AT#E2SMSRI, AT#SCFGEXT, AT\$GPSNMUNEX, AT\$GPSSW, AT+CESQ, AT+CFUN, AT+CGDCONT, AT+CPBS, ATD</p>
12	2022-05-31	<p>Updated commands:</p> <p>AT&V, AT+CFUN, AT+CREG, AT+IFC, AT#SSLSECCFG</p>
11	2022-04-11	<p>Added commands:</p> <p>AT#E2SMSRI, AT#FTPCWD, AT#FTPGETPKT, AT#FTPLIST, AT#FTPRECV, AT#JDRENH2, AT#JDR4GCFG, AT#MSCLASS, AT#NITZ, AT#PDPAUTH, AT#RFSTS, AT#SGACTCFG, AT#SSLCFG, AT#SSLD, AT#SSLEN, AT#SSLH, AT#SSLI, AT#SSLO, AT#SSLRECV, AT#SSLS, AT#SSLSECCFG, AT#SSLSECCFG2, AT#SSLSECDATA, AT#SSLSECDATAEXT, AT#SSLSEND, AT#SSLSENDEXT, AT#STGI, AT#STIA, AT#STSR, AT#TXCAL4GD, AT#TXCALD, AT#V24, AT#V24CFG, AT\$GPSNMUNEX, AT&C, AT&P, AT&V, AT&W, AT&Y, AT+CIND</p> <p>Updated commands:</p> <p>AT#CAP, AT#E2SMSRI, AT#HTTPQRY, AT#HTTPSND, AT#NITZ, AT#SIMDET, AT#SS, AT#STIA, AT\$GPSNMUN, AT&D, AT&K, AT+CAOC, AT+CCWA, AT+CCWE, AT+CEMODE, AT+CREG, AT+CFUN, AT+CGDSCONT, AT+CGEQSRDP, AT+CGEREP, AT+CGREG, AT+CIREG, AT+CLIP, AT+CLIR, AT+CLVL, AT+CMEE, AT+CMGF, AT+CMUT, AT+CNMI, AT+COLP, AT+COPS, AT+CPBS, AT+CRC, AT+CREG, AT+CRLP, AT+CSCB, AT+CSCS, AT+CSDH, AT+CSSN, AT+CSTA, AT+CTZR, AT+CTZU, AT+CUSD, AT+FCLASS, AT+IFC, AT+IPR, AT+SWITCHSIM, AT+VTD, ATE, ATQ, ATS0, ATS2, ATS3, ATS4, ATS5, ATV, ATX</p>
10	2021-12-01	<p>Added commands: AT#SO, AT&D</p> <p>Removed commands: AT#DGEN, AT#FWSWITCH, AT#QSS, AT#STUNEANT, AT+CALA, AT+CBST, AT+CMOD, AT+CPNER, AT+DS, AT+PACSP, ATS12, ATS25, ATS30, ATS38, ATS7, ATS8</p> <p>Updated commands: AT#ADC, AT#AUTOBND, AT#CAP, AT#CCLK, AT#CCLKMODE, AT#FASTSHDN, AT#FTPCFG, AT#FTPPUT, AT#GPIO, AT#HTTPCFG, AT\$GPSCFG, AT+CCLK, AT+CEVDP, AT+CGEREP, AT+CGREG, AT+CHUP, AT+CLVL, AT+COPN, AT+COPS, AT+CPIN, AT+CREG, AT+CSCB, AT+CTZU, AT+FCLASS, AT+GCAP, AT+IPR, AT+VTD, AT+VTS, ATS2</p>



Revision	Date	Changes
9	2021-08-06	Deleted table supported commands Removed command: #JDRGNSS Added and/or updated commands: +CLAC, +FCLASS, +CREG, #MONI, +CALA, #SIMDET, #SIMINCFG, #REBOOT, #SLED, #SLEDSAV, #SGACT, \$GPSCFG
8	2021-07-14	Added and/or updated commands: #ENHRST, #FASTSHDN, #FTPCFG, #FTPCLOSE, #FTPFSIZE, #FTPGET, #FTPOPEN, #FTPPUT, #FTPREST, #FTPTO, #FTPTYPE, +CCHO, +CGCLASS, +CPOL, +CSCA, ATS4
7	2021-06-09	Added and/or updated commands: +CGMI, +CGMM, +CGMR, +CCWA, +CEMODE, +CEVDP, +CGATT, +CGCLASS, +CGEQOSRDP, +CGPIAF, +CGTFTRDP, +CHUP, +CIREG, +CLIP, +CNMA, +COPN, +COPS, +CPAS, +CPBW, +CPWD, +CSCS, ATD
6	2021-04-21	Added Applicability table Legenda
5	2021-03-30	Added commands: +SWITCHSIM
4	2021-03-18	Guide generated from ATCreator tool
3	2021-02-25	Add commands
2	2020-12-18	Add SMS related commands
1	2020-11-24	Add #NTP、#OTAUPW
0	2020-09-28	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