



LE915Ax-P AT Commands Reference Guide

80671ST11047A Rev. 0 – 2020-09-17

TELIT
TECHNICAL
DOCUMENTATION

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

NOTICE

While reasonable efforts have been made to assure the accuracy of this document, Telit assumes no liability resulting from any inaccuracies or omissions in this document, or from use of the information obtained herein. The information in this document has been carefully checked and is believed to be reliable. However, no responsibility is assumed for inaccuracies or omissions. Telit reserves the right to make changes to any products described herein and reserves the right to revise this document and to make changes from time to time in content hereof with no obligation to notify any person of revisions or changes. Telit does not assume any liability arising out of 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.

It is possible that this publication may contain references to, or information about Telit products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that Telit intends to announce such Telit products, programming, or services in your country.

COPYRIGHTS

This instruction manual and the Telit products described in this instruction manual may be, include or describe copyrighted Telit material, such as computer programs stored in semiconductor memories or other media. Laws in the Italy and other countries preserve for 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 copyrighted material of Telit and its licensors contained herein or in the Telit products described in this instruction manual may not be copied, reproduced, distributed, merged or modified in any manner without the express written permission of Telit. Furthermore, the purchase of Telit products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Telit, as arises by operation of law in the sale of a product.

COMPUTER SOFTWARE COPYRIGHTS

The Telit and 3rd Party supplied Software (SW) products described in this instruction manual may include copyrighted Telit and other 3rd Party supplied computer programs stored in semiconductor memories or other media. Laws in the Italy and other countries preserve for Telit and other 3rd Party supplied SW certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form the copyrighted computer program. Accordingly, any copyrighted Telit or other 3rd Party supplied SW computer programs contained in the Telit products described in this instruction manual may not be copied (reverse engineered) or reproduced in any manner without the express written permission of Telit or the 3rd Party SW supplier. Furthermore, the purchase of Telit products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Telit or other 3rd Party supplied SW, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

USAGE AND DISCLOSURE RESTRICTIONS

I. License Agreements

The software described in this document is the property of Telit and its licensors. It is furnished by express license agreement only and may be used only in accordance with the terms of such an agreement.

II. Copyrighted Materials

Software and documentation are copyrighted materials. Making unauthorized copies is prohibited by law. No part of the software or documentation may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without prior written permission of Telit

III. High Risk Materials

Components, units, or third-party products used in 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: the operation 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 for such High Risk Activities.

IV. Trademarks

TELIT and the Stylized T Logo are registered in Trademark Office. All other product or service names are the property of their respective owners.

V. Third Party Rights


The software may include Third Party Right software. In this case you agree to comply with all terms and conditions imposed on you in respect of such separate software. In addition to Third Party Terms, the disclaimer of warranty and limitation of liability provisions in this License shall apply to the Third Party Right software.

TELIT HEREBY DISCLAIMS ANY AND ALL WARRANTIES EXPRESS OR IMPLIED FROM ANY THIRD PARTIES REGARDING ANY SEPARATE FILES, ANY THIRD PARTY MATERIALS INCLUDED IN THE SOFTWARE, ANY THIRD PARTY MATERIALS FROM WHICH THE SOFTWARE IS DERIVED (COLLECTIVELY "OTHER CODE"), AND THE USE OF ANY OR ALL THE OTHER CODE 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 CODE SHALL HAVE ANY LIABILITY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING WITHOUT LIMITATION LOST 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 CODE 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.

APPLICABILITY TABLE

  LE915Ax-P

 LR4.2.2.0-50209

CONTENTS

NOTICE	2
COPYRIGHTS	2
COMPUTER SOFTWARE COPYRIGHTS	2
USAGE AND DISCLOSURE RESTRICTIONS	3
APPLICABILITY TABLE	4
CONTENTS	5
1. INTRODUCTION	9
1.1. Scope	9
1.2. Audience	9
1.3. Contact Information, Support	9
1.4. Icons and Text Conventions	10
2. AT COMMANDS	11
2.1. Definitions	11
2.2. AT Command Syntax	11
2.2.1. String Type Parameters	12
2.2.2. Command Lines	12
2.2.2.1. ME Error Result Code - +CME ERROR: <err>	13
2.2.2.2. Message Service Failure Result Code - +CMS ERROR: <err>	15
2.2.3. Information Responses and Result Codes	15
2.2.4. Command Response Time-Out	16
2.2.5. Command Issuing Timing	16
3. AT COMMANDS REFERENCES	17
3.1. Cloud Connector Commands	18
3.1.1. AT+SQNHTTPCFG - HTTP Configure	18
3.1.2. AT+SQNHTTPQRY - HTTP Query	20
3.1.3. AT+SQNHTTPRCV – HTTP Receive	21
3.1.4. AT+SQNHTTPRING - HTTP Response URC:	22
3.1.5. AT+SQNHTTPSEND - HTTP SEND	23
3.1.6. AT+SQNSA - Socket Accept	25
3.1.7. AT+SQNSCFG - Socket Configuration	27
3.1.8. AT+SQNSCFGEXT - Socket Configuration Extended	29
3.1.9. AT+SQNSD - Socket Dial	31
3.1.10. AT+SQNSH - Socket Shutdown	33
3.1.11. AT+SQNSI - Socket Information	34
3.1.12. AT+SQNSL - Socket Listening	36
3.1.13. AT+SQNSLUDP - Socket Listen UDP	38
3.1.14. AT+SQNSO - Socket Restore	39
3.1.15. AT+SQNSRECV - Receive Data in Command ModeSend	40
3.1.16. AT+SQNSRING - Socket Activity Notification	41
3.1.17. AT+SQNSS - Socket Status	42

3.1.18.	AT+SQNSSEND - Send Data in Command Mode	44
3.1.19.	AT+SQNSSENDEXT - Extended Send Data In Command	46
3.2.	Device Configuration Commands	48
3.2.1.	AT^RESET - Hard Reset	48
3.2.2.	AT+CCLK – Clock Management	49
3.2.3.	AT+CFUN - Set Phone Functionality	51
3.2.4.	AT+CLAC - Available AT Commands	52
3.2.5.	AT+IPR - UART DCE Interface Data Rate Speed	53
3.2.6.	AT+SCPWD – Change PIN with <aid>	55
3.2.7.	AT+SMDTH – RF Thermistor Measurement	56
3.2.8.	AT+SQNAUTOCONNECT – Auto-Connect	57
3.2.9.	AT+SQNAUTOINTERNET – Internet Auto-Connect	58
3.2.10.	AT+SQNCFGDPR – Configure Dynamic Power Reduction parameters	59
3.2.11.	AT+SQNCLI – Send CLI to sequansd	60
3.2.12.	AT+SQNCTM – Conformance Test Mode:	61
3.2.13.	AT+SQNDPRMODE – Set Dynamic Power Reduction:	62
3.2.14.	AT+SQNSFACTORYRESET – Device Reset to Factory State:	63
3.2.15.	AT+SQNSNVR – Read Data in NVM:	64
3.2.16.	AT+SQNSNVW – Write Data in NVM:	66
3.2.17.	AT+SQNSSHDN – Device Shutdown:	68
3.2.18.	ATE - Command Echo	69
3.2.19.	ATV - Response Format	70
3.3.	Device Identification Commands	71
3.3.1.	AT+CGMI - Request Manufacturer Identification	71
3.3.2.	AT+CGMM - Subscriber Number	72
3.3.3.	AT+CGMR - Request Revision Identification	73
3.3.4.	AT+CGSN - Request Product Serial Number Identification	74
3.3.5.	AT+CIMI - Request International Mobile Subscriber Identity	76
3.4.	Device Upgrade Commands	77
3.4.1.	AT+SQNSUPGRADE - Device Upgrade	77
3.4.2.	AT+SQNSUPGRADECFG - Device Upgrade Configuration	79
3.5.	Network Services Commands	80
3.5.1.	AT+BGLTEPLMN - Background Search for LTE PLMNs	80
3.5.2.	AT+CEER - Extended Error Report	82
3.5.3.	AT+CEREG - EPS Network Registration Status	83
3.5.4.	AT+CESQ - Extended Signal Quality	86
3.5.5.	AT+CIND - Indicator Control	89
3.5.6.	AT+CMEC - Mobile Termination Control Mode:	91
3.5.7.	AT+CMEE - Report Mobile Termination Error	93
3.5.8.	AT+CMER - Mobile Termination Event Reporting	94
3.5.9.	AT+COPN - Read Operator Names	98
3.5.10.	AT+COPS - PLMN Selection	99
3.5.11.	AT+CPAS - Phone Activity Status	102
3.5.12.	AT+CPLS - Selection of Preferred PLMN List	103
3.5.13.	AT+CSQ - Signal Quality	104

3.5.14.	AT+CTZR - Time Zone Reporting	105
3.5.15.	AT+CTZU - Automatic Time Zone Update	107
3.5.16.	AT+SQNHPLMN - Read the Home PLMN	108
3.5.17.	AT+WS46 - PCCA STD 101 [17] Select Wireless Network.....	109
3.6.	Packet Domain Commands.....	111
3.6.1.	AT+CEMODE - UE Modes of Operation for EPS	111
3.6.2.	AT+CGACT - PDP Context Activate or Deactivate	112
3.6.3.	AT+CGATT - PS Attach or Detach.....	113
3.6.4.	AT+CGAUTH - PDP Context Authentication Parameters	114
3.6.5.	AT+CGCMOD - PDP Context Modify.....	115
3.6.6.	AT+CGCONTRDP - PDP Context Read Dynamic Parameters.....	116
3.6.7.	AT+CGDCONT - Define PDP Context	118
3.6.8.	AT+CGDSCONT - Define Secondary PDP Context.....	123
3.6.9.	AT+CGEQOS - Define EPS Quality of Service	125
3.6.10.	AT+CGEQOSRDP - EPS Quality of Service Read Dynamic Parameters	127
3.6.11.	AT+CGEREP - Packet Domain Event Reporting	129
3.6.12.	AT+CGPADDR - Show PDP Address	135
3.6.13.	AT+CGPIAF - Printing IP Address Format	136
3.6.14.	AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters	138
3.6.15.	AT+CGSMS - Select Service for MO SMS Messages	139
3.6.16.	AT+CGTFT - Traffic Flow Template	140
3.6.17.	AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters.....	143
3.7.	Phonebook Commands.....	145
3.7.1.	AT+CNUM - Subscriber Number.....	145
3.8.	SMS Commands	147
3.8.1.	AT+CMGC – Send Command.....	147
3.8.2.	AT+CMGD - Delete Message.....	148
3.8.3.	AT+CMGF - Message Format	149
3.8.4.	AT+CMGL - List Messages	150
3.8.5.	AT+CMGR - Read Message	152
3.8.6.	AT+CMGS - Send Short Message	153
3.8.7.	AT+CMGW - Write Message to Memory	155
3.8.8.	AT+CMMS - More Message to Send	156
3.8.9.	AT+CMSS - Send Message from Storage	157
3.8.10.	AT+CNMA - New Message Acknowledgement to ME/TA	158
3.8.11.	AT+CNMI - New Message Indications to Terminal Equipment	160
3.8.12.	AT+CPMS - Preferred Message Storage	163
3.8.13.	AT+CREG - Restore Settings.....	164
3.8.15.	AT+CSAS - Save Settings	165
3.8.17.	AT+CSCA - Service Center Address.....	166
3.8.17.1.	AT+CSCS - Select TE Character Set.....	167
3.8.18.	AT+CSDH - Show Text Mode Parameters	169
3.8.19.	AT+CSMP - Set Text Mode Parameters	170
3.8.20.	AT+CSMS - Select Message Service.....	171
3.9.	USAT Related Commands	173

3.9.1.	AT+CUSATE – Send USAT Envelope Command.....	173
3.9.2.	AT+CUSATR - Read USAT Profile	174
3.9.3.	AT+CUSATT - Send USAT Terminal Response	175
3.9.4.	AT+CUSATW - Write USAT Profile.....	176
3.9.5.	AT+SQNSTKAPNE- Change STK APN Configuration:.....	177
3.10.	USIM Related Commands.....	178
3.10.1.	AT+CLCK - Facility Lock/Unlock	178
3.10.2.	AT+CPIN - Enter the PIN	181
3.10.3.	AT+CPINR - Remaining PIN Retries.....	183
3.10.4.	AT+CPIN2 - Enter PIN2	185
3.10.5.	AT+CPOL - Preferred PLMN List	186
3.10.6.	AT+CPWD - Change Facility Password	188
3.10.7.	AT+CRSM - Restricted SIM access	189
3.10.8.	AT+CSIM - Generic SIM Access.....	191
3.10.9.	AT+SRSM - Restricted SIM Access with Application ID.....	192
4.	LIST OF ACRONYMS.....	194
5.	DOCUMENT HISTORY	195

1. INTRODUCTION

1.1. Scope

This document is aimed in providing a detailed specification and a comprehensive listing as a reference for the whole set of AT command.

1.2. Audience

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

1.3. Contact Information, Support

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

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

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

<http://www.telit.com>

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

Telit appreciates feedback from the users of our information.

1.4. Icons and Text Conventions



SET section – This section provides all information related to SET functionality of involved AT command. If it has got strictly and relevant SET information, these are located at section end.



READ section – This section provides all information related to READ functionality of involved AT command. If it has got strictly and relevant READ information, these are located at section end.



TEST section – This section provides all information related to TEST functionality of involved AT command. If it has got strictly and relevant TEST information, these are located at section end.



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



EXAMPLE section – This section provides useful examples related to involved AT command.



NOTE section – This section provides all information related to involved AT commands. Each note can provide a different level of information: danger, caution/warning and tip/information.



Danger – This information **MUST** be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

2. AT COMMANDS

The Telit wireless module family can be controlled via the serial interface using the standard AT commands.¹ The Telit wireless module family is compliant 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, Telit wireless module family supports also Telit proprietary AT commands for special purposes. The following is a description of how to use the AT commands with the Telit wireless module family.

2.1. Definitions

The following syntactical definitions apply:

- <CR>** **Carriage return character**, is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255, is specified within 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 carriage return character if verbose 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 syntactical element. They do not appear in the command line.
- [...]** Optional sub parameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When sub parameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their sub parameters, and so have not a Read command, which are called *action type* commands, action should be done based on the recommended default setting of the sub parameter.

2.2. AT Command Syntax

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

There are two types of extended command:

- **Parameter type commands.** This type of commands may be "set" (to store a value or values for later use), "read" (to determine the current value or values stored), or "tested" (to determine ranges of values supported). Each of them has a test command (trailing =?) to give information about the type of its sub parameters; they also have a Read command (trailing?) to check the current values of sub parameters.
 - **Action type commands.** This type of command may be "executed" or "tested".
 - "executed" to invoke a function of the equipment, which generally involves more than the simple storage of a value for later use
 - "tested" to determine:
 - if sub parameters are associated with the action, the ranges of sub parameters values that are supported; if the command has no sub parameters, issuing the correspondent Test command (trailing =?) raises the result code "**ERROR**".
- Note: issuing the Read command (trailing?) causes the command to be executed.

¹ 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.

- whether or not the equipment implements the Action Command (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 don't store the values of any of their possible sub parameters.

Moreover:

The response to the Test Command (trailing =?) may be changed in the future by Telit to allow 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 **OK** result code to be returned 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 has to 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 requires always to write the input string parameters within 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**".

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

The basic structures of the command line are:

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

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

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

anyway, it is always preferable to separate into different command lines the basic commands and the extended commands; furthermore, it is suggested to avoid placing several action commands in the same command line,

² The set of proprietary AT commands differentiates 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

because if one of them fails, then an error message is received but it is not possible to argue which one of them has failed the execution.

If command **V1** is enabled (verbose responses codes) and all commands in a command line has been performed successfully, 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 command itself is invalid, or command cannot be performed 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 performed successfully, 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 command itself is invalid, or command cannot be performed 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>**.



The command line buffer accepts a maximum of 560 characters. If this number is exceeded none of the commands will be executed and TA returns **ERROR**.

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

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

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

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

Numeric Format ³	Verbose Format ⁴
0	phone failure
1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency calls only

³ Not all modules support the error codes shown in the table.

⁴ There could be small variations in the message depending on the module in use.

Numeric Format ³	Verbose Format ⁴
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
48	hidden key required (See NOTE 2)
49	EAP method not supported
50	Incorrect parameters
60	System failure
100	unknown
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
126	Operation temporarily not allowed
132	service option not supported (#32)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
151	VBS/VGCS not supported by the network
152	No service subscription on SIM
153	No subscription for group ID
154	Group Id not activated on SIM
155	No matching notification
156	VBS/VGCS call already present
157	Congestion
158	Network failure
159	Uplink busy
160	No access rights for SIM file
161	No subscription for priority
162	operation not applicable or not possible
163	Group Id prefixes not supported
164	Group Id prefixes not usable for VBS
165	Group Id prefix value invalid
171	Last PDN disconnection not allowed (#49)
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number
261	unknown subscriber
262	service not available
263	unknown class
264	unknown network message
273	Minimum TFT per PDP address error
274	Duplicate TFT eval prec index
275	Invalid TFT param combination
277	Invalid number of parameters
278	Invalid Parameter
320	Call index error
321	Call state error
322	Sys state error
323	Parameters error
528	failed: General error
529	failed: Corrupted image.
530	failed: Invalid signature
531	failed: Network error

Numeric Format ³	Verbose Format ⁴
532	failed: Upgrade already in progress
533	cancel failed: No upgrade in progress
540	configuration failed: General error
541	configuration failed: Invalid function
542	configuration failed: Invalid function parameter
543	configuration failed: pin(s) already assigned to another function

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
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	(U)SIM not inserted
311	(U)SIM PIN required
312	PH-(U)SIM PIN required
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required
318	(U)SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
500	unknown error
...510	other values in range 256...511 are reserved
<err> 512 and on are manufacturer specific	
512...	

2.2.3. Information Responses and Result Codes

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

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

- result code `<CR><LF>OK<CR><LF>`

Moreover, there are other two types of result codes:

- *result codes* that inform about progress of TA operation (e.g. connection establishment **CONNECT**)
- *result codes* that indicate occurrence of an event not directly associated with 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>3F3F5
2	RING
3	NO CARRIER
4	ERROR
6	NO DIALTONE
7	BUSY
8	NO ANSWER
10	CONNECT 24004
11	CONNECT 48004
12	CONNECT 96004
15	CONNECT 144004
23	CONNECT 1200/754

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 needed to process the given command and return the response varies, depending on the command type. Commands that do not interact with the SIM or the network, and only involve internal setups or readings, have an immediate response. Commands that interact with the SIM or the network could take many seconds to send a response, depending on SIM configuration (e.g., 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 shall always be respected, and a new command must not be issued before the module has terminated all the sending of its response result code (whatever it may be).

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.

It is advisable anyway 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 be respected.

⁵ <text> can be "300", "1200", "2400", "4800", "9600", "14400" or "1200/75"

3. AT COMMANDS REFERENCES

3.1. Cloud Connector Commands

3.1.1. AT+SQNHTTPCFG - HTTP Configure

This command sets the parameters needed to the HTTP connection.

Parameters of +SQNHTTPCFG are automatically saved to NVM. They are persistent after reboot.



AT++SQNHTTPCFG=<prof_id>[,<server_address>[,<server_port>[,<auth_type>[,<username>[,<password>[,<ssl_enabled>[,<timeout>[,<cid>[,<spid>]]]]]]]]]

Parameter:

Name	Type	Default	Description
<prof_id>	integer		Numeric parameter indicating the profile identifier.
<server_address>	string		IP address of the HTTP server. This parameter can be either <ul style="list-style-type: none"> • Any valid IP address in the format: "xxx.xxx.xxx.xxx" • Any host name to be solved with a DNS query
<server_port>	integer	80	Numeric parameter indicating the TCP remote port of the HTTP server to connect to. Default values are 80 for the first, second and third profiles.
<auth_type>	integer	0	Integer in range [0-1]. Numeric parameter indicating the HTTP authentication type.
Values:			
0 : No authentication			
1 : Basic authentication			
<username>	string	empty	Authentication user identification string for HTTP
<password>	string	empty	Authentication password for HTTP
<ssl_enabled>	Integer	0	Indicates if the SSL encryption is enabled
Values:			
0 : SSL encryption disabled			
1 : SSL encryption enabled			
<timeout>	Integer	120	Time interval in seconds to wait for receiving data from HTTP server. [1-120]
<cid>	integer	3	PDN Context Identifier. [1-8]
<spID>	Integer	1	Security Profile identifier to be used for HTTPS request if <ssl_enabled>=1
<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+SQNHTTPCFG?

+SQNHTTPCFG:

<prof_id1>,<server_address1>,<server_port1>,<auth_type1>,<username1>,<password1>,<ssl_enabled1>,<timeout1>,<cid1>,<spld1>

...

+SQNHTTPCFG:

<prof_idN>,<server_addressN>,<server_portN>,<auth_typeN>,<usernameN>,<passwordN>,<ssl_enabledN>,<timeoutN>,<cidN>,<spldN>

OK



AT+SQNHTTPCFG=?

+SQNHTTPCFG:<prof_id>,<s_length>,<server_port>,<auth_type>,<u_length>,<p_length>,<ssl_enabled>,<timeout>,<cid>,<spld>

OK



A special form of the Set command, +SQNHTTPCFG=<prof_id>, causes the values for profile number <prof_id> to reset to default values.

3.1.2. AT+SQNHTTPQRY - HTTP Query

This command performs HTTP GET, HEAD or DELETE request to server.

AT+SQNHTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]

Parameter:

Name	Type	Default	Description
<prof_id>	integer	[0-2]	Numeric parameter indicating the profile identifier
<command>	integer	[0-2]	Command requested to HTTP server
Values:			
	0	:	GET
	1	:	HEAD
	2	:	DELETE
<resource>	string		HTTP resource(URI), object of the request
<extra_header_line>	string		Optional HTTP header line (see <Note_1>)

AT+SQNHTTPQRY=?

+SQNHTTPQRY=<prof_id>,<command>,<resource>[,<extra_header_line>]

ok

Test command returns the range of supported values/lengths for all the subparameters. When an answer from HTTP server is received, the +SQNHTTPRING URC is shown.

Parameter:

Name	Type	Default	Description
<prof_id>	integer	[0-2]	Numeric parameter indicating the profile identifier
<command>	integer	[0-2]	Command requested to HTTP server
Values:			
	0	:	GET
	1	:	HEAD
	2	:	DELETE
<r_length>	integer		This value is used only in test command AT+SQNHTTPQRY=?. Maximum length of of parameter <resource>
<m_length>	integer		This value is used only in test command AT+SQNHTTPQRY=?. Maximum length of of parameter <extra_header_line>

3.1.3. AT+SQNHTTPRCV – HTTP Receive

This command is used to read the body of HTTP response. It can be used after receiving of HTTP Response URC: +SQNHTTPRING



AT+SQNHTTPRCV=<prof_id>,<maxbytes>

Set command permits the user to read data from HTTP server in response to a previous HTTP module request. The module is notified of these data by the +SQNHTTPRING URC. The device shall prompt a three character sequence <<< (<less_than><less_than><less_than> (IRA 60, 60, 60)) followed by the data. If reading ends successfully, the response is OK; otherwise an error code is reported.

Parameter:

Name	Type	Default	Description
<prof_id>	Integer		Integer in range [0-2]. Numeric parameter indicating the profile identifier.
<max_bytes>	Integer	0	Max number of bytes to read at a time, range is [0,64-1500]., which means infinite size.
<http_status_code>	Integer		Status code, as received from the server (see RFC2616)



AT+SQNHTTPRCV=?

Test command returns values supported as a compound value.

+SQNHTTPQRY=<prof_id>,<max_bytes>

ok



If <max_byte> is unspecified, server data will be transferred all in once. If the data are not present or if the +SQNHTTPRING <http_status_code> parameter has value 0, then an error code is reported.



- Setting www.w3.org as remote server.

AT+SQNHTTPCFG=1,"www.w3.org"

OK

- Perform HTTP GET request to "/Summary.html" page.

AT+SQNHTTPQRY=1,0,"/Summary.html"

OK

- +SQNHTTPRING URC is shown. Status code is 200 (OK), content type has an extension and content-length is 5223 bytes.

+SQNHTTPRING: 1,200,"text/html; charset=iso-8859-1",5223

- Perform infinite reading of server's response.

AT+SQNHTTPRCV=1

<<<<HTML> <HEAD>

... output omitted ...

</ADDRESS></BODY></HTML>

OK

3.1.4. AT+SQNHTTPRING - HTTP Response URC:

This URC is shown when an answer from HTTP server is received.



AT+SQNHTTPRING=?

+SQNHTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>

Parameters:

Name	Type	Default	Description
<prof_id>	integer		HTTP profile identifier [0-2]
<index>	integer		3-digit HTTP status code, as received from the server
<content_type>	string		"Content-Type" header line, as received from the server
<data_size>			"Content-Length:" header line, as received from the server



If server doesn't answer within the time interval specified in <timeout> parameter of +SQNHTTPCFG command, then the <http_status_code> parameter has value 0, <content_type> parameter is empty and <data_size> parameter has value 0. If "Content-Length" header line is absent in the response from server, then <data_size> parameter has value 0.

3.1.5. AT+SQNHTTPSND - HTTP SEND

AT+SQNHTTPSND=<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]

Set command performs a POST or PUT request to HTTP server and starts sending data to the server. The device shall prompt a three character sequence >>> (<greater_than><greater_than><greater_than> (IRA 62, 62, 62)) after command line is terminated with <CR>; after that the data can be entered from TE, sized <data_len> bytes. When the HTTP server answer is received, then the following URC (when supported) is put on the serial port:
+SQNHTTPRING: <prof_id>,<http_status_code>,<content_type>,<data_size>.

Parameter:

Name	Type	Default	Description
<prof_id>	integer	[0-2]	Numeric parameter indicating the profile identifier
<command>	integer	[0-1]	Command requested to HTTP server 0 : POST 1 : PUT
<resource>	string		HTTP resource(URI), object of the request
<data_len>	Integer		Lenth of input data in bytes
<post_param>	String		HTTP Content-Type identifier. Used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier. Other content-free string corresponding to other content type and possible sub-types.

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
4	“application/json”

<extra_header_line>	string	Optional HTTP header line
---------------------	--------	---------------------------

- If sending ends successfully, the response is OK; otherwise an error code is reported. The HTTP request header sent with +SQNHTTPQRY always contains the “Connection: close” line which can’t beremoved.

AT+SQNHTTPSND=?

Test command returns values supported as a compound value.

Parameter:

Name	Type	Default	Description
<content_type>	string		“Content-Type” header line, as received from the server (see RFC2616)

<data_size>	integer	Amount of data (in byte) received from the server. If the server doesn't report the "Content-Length:" header line, the parameter value is 0.
<p>i If sending ends successfully, the response is OK; otherwise an error code is reported. The HTTP request header sent with +SQNHTTPQRY always contains the "Connection: close" line which can't be removed</p>		
<r_length>	integer	Maximum length of parameter <resource>
<p_length>	integer	Maximum length of parameter <post_param>
<m_length>	integer	Maximum length of parameter <extra_header_line>



- Post 100 byte without "Content-type" header
AT+SQNHTTPSND=0,0,"/"/,100
 >>>
- Post 100 byte with "application/x-www-form-urlencoded"
AT+SQNHTTPSND=0,0,"/"/,100,0
 >>>
- Post 100 byte with "multipart/form-data" and extension
AT+SQNHTTPSND=0,0,"/"/,100,"3:boundary=----FormBoundary"
 >>>

3.1.6. AT+SQNSA - Socket Accept

See also Mobile Termination Error Result Code: +CME ERROR for <err> values.



AT+SQNSA=<connId>[,<conMode>]

Execution command accepts an incoming socket connection after an unsolicited result code +SQNSRING: <connId>. Note that this +SQNSRING URC is the consequence of the creation of a socket listen (+SQNSL).

Setting the command before having received a +SQNSRING URC will result in an ERROR indication, with information that a connection request has not yet been received.

Use +SQNSH command to reject the connection.

Possible intermediate response:

CONNECT

OK

ERROR

NO CARRIER

+CME ERROR: <err>

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<connMode>	integer	0	Connection mode, optional, [0-1]

Values:

0 : Online data mode

1 : Command mode



AT+SQNSA=?

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

+SQNSA: (1-6) [, (0-1)]



• General syntax:

at+sqnsa=?

+SQNSA: (1-6)[, (0-1)]

OK

at+sqnsa=1

CONNECT

at+sqnsa=2,1

OK

• Opening listening TCP socket on port 1234.

AT+SQNSL=1,1,1234

OK

• +SQNSRING URC indicates here that there is incoming connection on **socket #1**.

+SQNSRING: 1

- Accept connection in command mode.

AT+SQNSA=1,1

OK

- Check socket status. There is a connection with remote host on 192.168.15.135:41829.

AT+SQNSS

+SQNSS: 1,2,192.168.15.1,1234,192.168.15.135,41829

+SQNSS: 2,0

+SQNSS: 3,0

+SQNSS: 4,0

+SQNSS: 5,0

+SQNSS: 6,0

OK

Table 1-6: connMode

Value Description

0 Default. Online data mode

1 Command mode CLOUD CONNECTOR COMMANDS

SOCKET ACCEPT: +SQNSA

14 PROPRIETARY AT COMMANDS REFERENCE MANUAL - LR 4.2.2.0

SEQUANS Communications

- **+SQNSRING URC indicates that some data is received on socket #1.**

+SQNSRING: 1

- **Receive up to 10 bytes from 1st socket. 6 bytes are actually received.**

AT+SQNSRECV=1,10

+SQNSRECV: 1,6

Test!

OK

- **Send some text to socket. Note the final <Ctrl+Z> before <CR>.**

AT+SQNSSEND=1

> Some text <Ctrl+Z>

OK

- **Shutdown connection.**

AT+SQNSH=1

OK

3.1.7. AT+SQNSCFG - Socket Configuration

This command sets the socket configuration parameters.



These values are automatically saved in the device's NVRAM.



AT+SQNSCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>


Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<cid>	integer		PDP context identifier
<pktSz>	integer	300	Packet size to be used by the TCP/UDP/IP stack for data sending. Used for online data mode only
Values:			
0	:		Automatically chosen by the device
1-1500	:		Packet size in bytes
<maxTo>	integer	90s	Exchange timeout. If there is no data exchange within this timeout period, then the connection is closed. Note : The value is ignored if the socket is in listening state
Values:			
0	:		No timeout
1-65535	:		Timeout value in seconds
<connTo>	Integer	600	Connection timeout. If a connection to the remote can't be established within this timeout period, then an error is raised.
Values:			
0	:		No timeout
10-1200	:		Timeout value in hundreds of milliseconds
<txTo>	Integer	50	Data sending timeout. Data is sent even if less than max packet size, after this period. Used for online data mode only.
Values:			
0	:		No timeout
1-255	:		Timeout value in hundreds of milliseconds



AT+SQNSCFG?

```
+SQNSCFG:<connId1>,<cid1>,<pktSz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF>
...
+SQNSCFG:<connId6>,<cid6>,<pktSz6>,<maxTo6>,<connTo1>,<txTo6>
OK
```

?  AT+SQNSCFG=?
+SQNSCFG:(1-6),(0-6),(0-1500),(0-65535),(0,10-1200),(0-255)
OK

</> at+sqnscfg=?
+SQNSCFG: (1-6),(0-5),(0-1500),(0-65535),(0,10-1200),(0-255)
OK
at+sqnscfg?
+SQNSCFG: 1,1,300,90,600,50
+SQNSCFG: 2,1,300,90,600,50
+SQNSCFG: 3,1,300,90,600,50
+SQNSCFG: 4,1,300,90,600,50
+SQNSCFG: 5,1,300,90,600,50
+SQNSCFG: 6,1,300,90,600,50
OK
at+sqnscfg=1,3,0,90,600,50
OK

3.1.8. AT+SQNSCFGEXT - Socket Configuration Extended

This command sets the socket configuration extended parameters.



These values are automatically saved in the device's NVRAM.



AT+SQNSCFGEXT=<connId>,<srMode>,<recvDataMode>,<keepalive>,[<listenAutoRsp>],[<sendDataMode>[,<unused_A> [,<unused_B>]]]]

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<srMode>	integer	0	SQNSRING URC mode
		Values:	
		0	Normal mode (default), SQNRING: <connId>
		1	Data about mode, SQNSRING: <connId>,<recvData>
		2	Data view mode, SQNSRING: <connId>,<recvData>,<data>
<recvData Mode>	integer	0	"Received data view mode" presentation format
		Values:	
		0	Data represented as text
		1	Data represented as sequence of hexadecimal numbers(from 00 to FF). Note : that this parameter changes the presentation of SQNSRING URC but not SQNSSEND.No conversion is done on the data before sending on the network
<keepalive>	integer		Currently unused. [0-240]
<listen AutoRsp>	Integer	0	"Listen auto-response mode", that affects AT+SQNSL command
		Values:	
		0	Deactivated. Call AT+SQNSA to accept incoming TCP connectio
		1	Activated. Incoming TCP connection is automatically accepted. Modem remains in command mode.
<sendData Mode>	Integer	0	"Sent data view mode" presentation format.
		Values:	
		0	Data represented as text.
		1	Data represented as sequence of hexadecimal numbers (from 00 to FF)



AT+SQNSCFGEXT?

Read command returns current value of the parameter

+SQNSCFGEXT:<connId1>,<srMode1>,<recvDataMode1>,<keepalive1>,<listenAutoRsp1>,<sendDataMode1>,<unused_A1>,<unused_B1><CR><LF>

...

+SQNSCFGEXT:<connId6>,<srMode6>,<recvDataMode6>,<keepalive6>,<listenAutoRsp6>,<sendDataMode6>,<unused_A6>,<unused_B6><CR><LF>

<listenAutoRsp6>, <sendDataMode6>, <unused_A6>, <unused_B6>
OK



AT+SQNSCFGEXT=?

Test command returns supported values of the parameter

+SQNSCFGEXT:(1-6),(0-2),(0-1),(0-240)[,(0-1)[,(0-1)[,(0)[,(0)]]]]
OK



at+sqnscfgext=?

+SQNSCFGEXT: (1-6),(0-2),(0-1),(0-240),(0-1),(0-1),(0),(0)

OK

at+sqnscfgext?

+SQNSCFGEXT: 1,0,0,0,0,0,0,0

+SQNSCFGEXT: 2,0,0,0,0,0,0,0

+SQNSCFGEXT: 3,0,0,0,0,0,0,0

+SQNSCFGEXT: 4,0,0,0,0,0,0,0

+SQNSCFGEXT: 5,0,0,0,0,0,0,0

+SQNSCFGEXT: 6,0,0,0,0,0,0,0

OK

at+sqnscfgext=1,0,0,0

OK

3.1.9. AT+SQNSD - Socket Dial

This command opens a remote connection via socket.

Important: The +++ string will be processed as escape sequence if it is issued after a 1 second delay without transmission or reception.



1. If <connMode> is set to online mode connection and the command is successful, then we enter the 'online data mode' and we see the intermediate result code CONNECT. After the CONNECT, we can suspend the direct interface to the socket connection (the socket remains 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 at any moment (unless the socket inactivity timer timeouts, see Socket Configuration: +SQNSCFG) by using the Socket Restore: +SQNSO command with the corresponding <connId>.

2. 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.

3. If some data comes in through a connected socket and is not read because the module entered 'command mode' before reading it (after an escape sequence or after +SQNSD has been issued with <connMode> set to 'command mode' connection), this data is buffered and we receive the SQNSRING URC (SQNSRING presentation format depends on the last +SQNSCFGEXT setting). It is possible to read this data later with +SQNSRECV. Under the same hypothesis, it is possible to send data while in 'command mode' by issuing +SQNSSEND.



AT+SQNSD=<connId>,<txProt>,<rPort>,<IPAddr>[,<closureType>[,<IPort>[,<connMode>[,<acceptAnyRemote>]]]]]

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<txProt>	integer		Transmission protocol
Values:			
	0	:	TCP
	1	:	UDP
<rPort>	integer		Remote host port to contact. [0-65535]
<IPAddr>	string		Address of the remote host. Any valid IP address in the format "xxx.xxx.xxx.xxx" or any host name solved with a DNS query.
<closureType>	integer	0	Integer type. Socket closure behaviour for TCP, has no effect for UDP connections. Important : The +++ string will be processed as escape sequence if it is issued after a 1 second delay without transmission or reception.
Values:			
	0	:	Local host closes immediately when remote host hasclosed
	1	:	Local host closes after an escape sequence (+++)
<IPort>	integer	0	UDP connection local port, has no effect for TCP connections.
<connMode>	Integer	0	Connection mode

Values:

- 0 : Online mode connection
- 1 : Command mode connection

Name	Type	Default	Description
<acceptAny Remote>	integer	0	Determines whether receive/send datagrams from/to any another remote than <IPAddr>:<rPort> or not. [0-2]

Values:

- 0 : Disabled (default)
- 1 : Enables receive data from any other remote than <IPAddr>:<rPort>
- 2 : Enables receive data from any other remote than <IPAddr>:<rPort> and enables send data to anyother remote than <IPAddr>:<rPort> within the same socket family using +SQNSSEND command.

AT+SQNSD=?

Test command returns the supported range of parameter values.

+SQNSD:

(1-6),(0-1),(0-65535),<IPAddr>[, (0,255)[, (0-65535)[, (0-1)[, (0-2)]]]]

OK



at+sqnsd=?

+SQNSD:

(1-6),(0-1),(0-65535),<IPAddr>[, (0,255)[, (0-65535)[, (0-1)[, (0-2)]]]]

OK

at+sqnsd=1,0,7,"10.10.10.4",0,0,0

CONNECT

at+sqnsd=1,0,80,"www.example.com",0,0,1

OK

3.1.10. AT+SQNSH - Socket Shutdown

This command closes a socket connection.



A socket connection can be closed only when it is in suspended mode (even if data is pending). Trying to close an active socket connection will produce an error.



AT+SQNSH=<connId>

Parameter:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier.



AT+SQNSH=?

Test command reports the range of supported values for parameter

+SQNSH: (1-6)

OK



at+sqnsh=?

+SQNSH: (1-6)

OK

at+sqnsh=1

OK

3.1.11. AT+SQNSI - Socket Information



AT+SQNSI=<connId>

Execution command is used to get information about socket data traffic.

+SQNSI:<connId>,<sent>,<received>,<buff_in>,<ack_waiting>

OK

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<sent>	integer	0	Total amount (in bytes) of sent data since the last time the socket connection identified by <connId> has been opened.
<received>	integer	0	Total amount (in bytes) of received data since the last time the socket connection identified by <connId> has been opened.
<buff_in>	integer		Total amount (in bytes) of data just arrived through the socket connection identified by <connId> and currently buffered, not yet read.
<ack_waiting>	Integer	0	Total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by <connId> has been opened. Note: Data not yet acknowledged is available only for TCP connections. The value <ack_waiting> is always 0 for UDP connections.



AT+SQNSI

Read command returns current value of the parameter

+SQNSI:<connId1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1><CR><LF>

...

+SQNSI:<connId6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6>

OK



AT+SQNSI=?

Test command reports the range for parameter <connId>.

+SQNSI:(1-6)

OK

Important : On encrypted connection, the returned data traffic information takes into account the encryption overhead (information is taken at TCP layer).



• Test Command

AT+SQNSI=?

+SQNSI: (1-6)

OK

• Read Command

AT+SQNSI

+SQNSI: 1,32,75,8,0

+SQNSI: 2,0,0,0,0

+SQNSI: 3,0,0,0,0

+SQNSI: 4,0,0,0,0

+SQNSI: 5,0,0,0,0

+SQNSI: 6,0,0,0,0

OK

• Set connection 1

AT+SQNSI=1

+SQNSI: 1,0,0,0,0

OK

3.1.12. AT+SQNSL - Socket Listening

This command opens/closes a socket listening for an incoming TCP connection on a specified port. If successful, the command returns a final result code OK. Then, when there is an incoming connection on the local port, an unsolicited result code +SQNSRING: <connId> is received.

Afterwards, the user can use Socket Accept: +SQNSA to accept the connection or Socket Shutdown: +SQNSH to reject that incoming connection. <listenPort> is optional when closing the socket. If the ListenAutoRsp flag from +SQNSCFGEXT command has been set, then, when a TCP connection request comes on the input port, 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, then the following URC is received: +SQNSH: <connId>.



AT+SQNSL=<connId>,<listenState>,<listenPort>[,<lingerT>]

Parameters:

Name	Type	Default	Description
<connId>	integer		Sockets connection identifier [1-6]
<listenState>	Integer		Open or close the listening socket
Values:			
0	:		Close listening socket
1	:		Open listening socket
<listenPort>	integer		Local listening TCP port [0-65535]
<linger>	integer	0	Closure type, optional [0-255]
Values:			
0	:		Immediate closure after remote closure
255	:		Socket is closed after an escape sequence(+++) or after remote closure



AT+SQNSL?

Read command returns all the actual listening TCP sockets:

```
+SQNSL:<connId1><CR><LF>
...
[+SQNSL:<connIdN>]
```



AT+SQNSL=?

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

```
+SQNSL: (1-6),(0-1),(0-65535),(0,255)
```



at+sqnsl=?

```
+SQNSL: (1-6),(0-1),(0-65535)[,(0,255)]
```

```
OK
```

```
at+sqnsl?
```

```
OK
```

```
at+sqnsl=1,1,99
```

```
OK
```

```
at+sqnsl=2,1,555
```

```
OK
```

at+sqnsl?
+SQNSL: 1
+SQNSL: 2
OK

3.1.13. AT+SQNSLUDP - Socket Listen UDP

This command opens/closes a socket listening for an incoming UDP connection on a specified port. If successful, commands return a final result code OK. Then, when there is an incoming connection on the local port, unsolicited result code +SQNSRING: <connId> is received.

Afterwards user can use +SQNSA to accept the connection or +SQNSH to refuse it. <listenPort> is optional when closing the socket. If the socket is closed by the network the following unsolicited result code is received +SQNSLUDP: ABORTED.



AT+SQNSLUDP=<connId>,<listenState>,[<listenPort>]

Parameters:

Name	Type	Default	Description
<connId>	integer		Sockets connection identifier [1-6]
<listenState>	integer		Open of close the listening socket
Values:			
	0	:	Close listening socket
	1	:	Open listening socket
<listenPort>	integer		Local listening TCP port [0-65535]



AT+SQNSLUDP?

Read command returns all the actual listening sockets:

```
+SQNSL:<connId1>
...
+SQNSL:<connIdN>
OK
```



AT+SQNSLUDP=?

Test command returns values supported as a compound value.

```
+SQNSLUDP: (1-6),(0-1),(0-65535)
```



```
at+sqnsludp=?
+SQNSLUDP: (1-6),(0-1),(0-65535)
OK
at+sqnsludp?
OK
at+sqnsludp=1,1,456
OK
at+sqnsludp?
+SQNSLUDP: 1
OK
```

3.1.14. AT+SQNSO - Socket Restore

This command resumes the socket connection which has been suspended by the escape sequence. Important: The +++ string will be processed as escape sequence if it is issued after a 1 second delay without transmission or reception.



After the CONNECT, you can suspend the socket connection (the socket remaining open) using the escape sequence (+++). The device re-enters 'command mode' and you will receive the final result code OK after the suspension.



AT+SQNSO=<connId>

Possible intermediate response: **CONNECT**

OK

ERROR

NO CARRIER

+CME ERROR:<err>

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier



AT+SQNSO=?

Test command returns <connId> and **OK**.

+SQNSO: (1-6)

OK



at+sqnso=?

+SQNSO: (1-6)

OK

at+sqnso=1

CONNECT

3.1.15. AT+SQNSRECV - Receive Data in Command ModeSend

This command reads data arrived through a connected socket, buffered and not yet read because the module entered 'command mode' before reading them. The module is notified of these data by a SQNSRING URC, whose presentation format depends on the last +SQNSCFGEXT setting.



1. Issuing AT+SQNSRECV when there's no buffered data raises an error.
2. <IPAddr> and <rPort> are showed only if <acceptAnyRemote>=2.



AT+SQNSRECV=<connId>,<maxByte>

+SQNSRECV:<connId>,<maxByte>[,<IPAddr>,<rPort>]<CR><LF><data>

OK

ERROR

+CME ERROR:<err>

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<cid>	integer		Maximum number of bytes to read [1-1500]



AT+ +SQNSRECV=?

Test command returns values supported as a compound value.

+SQNSRECV:(1-6), (1-1500)

OK



at+sqnsrecv=?

+SQNSRECV: (1-6),(1-1500)

OK

at+sqnsrecv=1,5

+SQNSRECV: 1,5

hello+OK

3.1.16. AT+SQNSRING - Socket Activity Notification

Unsolicited response that can be received while being in 'command mode' only. It can notify of data arrival, more or less detailed (see syntax), and of an incoming TCP connection if a listening socket has been started before with +SQNSL command.



- After data arrival notification, received bytes are flushed only by explicit read through +SQNSRECV command.
- Internal buffering is limited and +SQNSRING notification will stop until host starts reading data through +SQNSRECV command. URC will be sent again if enough data has been read and if there are still new data arrival to notify.



AT+SQNSRING

- When AT+SQNSCFGEXT parameter <srMode> is set to 0 (default), or for an incoming TCP connection:

+SQNSRING:<connId>

- When AT+SQNSCFGEXT parameter <srMode> is set to 1:

+SQNSRING:<connId>,<recData>

- When AT+SQNSCFGEXT parameter <srMode> is set to 2:

+SQNSRING:<connId>,<recData>,<data>

Parameter:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<connMode>	integer		Maximum number of bytes to
<data>			Data to read

Example

3.1.17. AT+SQNSS - Socket Status

This command reports the current status of the sockets.



AT+SQNSSOK

```
+SQNSS:<connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1><CR><LF>
...
+SQNSS:<connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6><CR><LF>
OK
```

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<state>	integer		Current state of the socket [0-6]

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>	IP address associated by the context activation to the socket
<locPort>	One of the following: <ul style="list-style-type: none"> • The listening port if the socket is in listen mode. • The local port for the connection if the socket is connected to a remote machine.
<remIP>	Remote IP address when the device is connected to a remote machine
<remPort>	Connected port on the remote machine



AT +SQNSS?

Read command returns all socket status:

```
+SQNSS:<connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1><CR><LF>
...
+SQNSS:<connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6><CR><LF>
OK
```



AT+SQNSS=?

Test command returns OK.

OK



at+sqnss

+SQNSS: 1,2,192.168.6.8,36419,65.52.116.180,80

+SQNSS: 2,4,0.0.0.0,888,,0

+SQNSS: 3,0

+SQNSS: 4,5,192.168.9.2,999,10.10.10.6,45133

+SQNSS: 5,3,192.168.6.2,57037,10.10.10.4,7

+SQNSS: 6,0

at+sqnss?

+SQNSS: 1,0

+SQNSS: 2,0

+SQNSS: 3,0

+SQNSS: 4,0

+SQNSS: 5,0

+SQNSS: 6,0

OK

at+sqnss=?

OK

3.1.18. AT+SQNSSEND - Send Data in Command Mode

This command, while the module is in command mode, sends data through a connected socket. To complete the operation, send Ctrl-Z char (0x1A in hexadecimal). To exit without sending the message, send ESC char (0x1B in hexadecimal). If data is successfully sent, then the response is OK. If data sending fails for some reason, then an error code is reported.



1. The maximum number of bytes to send is 1500.
2. It is possible to use +SQNSSEND only if the connection was opened by +SQNSD, else the UE will raise an error.
3. A byte corresponding to BS character (0x08) is processed with its corresponding meaning (back space). Therefore, the previous byte will be cancelled and the BS character itself will not be sent.
4. If <IPAddr> and <rPort> parameters are not passed, these values are taken from +SQNSD command.



AT+SQNSSEND=<connId>[,<IPAddr>,<rPort>,<RAI>]

Intermediate result code: >

OK

ERROR

NO CARRIER

+CME ERROR:<err>

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<IPAddr>	string		Address of the remote host. It can be any valid IP address or any host name to be solved with a DNS query. If <IPAddr> parameter is not passed, this value is taken from +SQNSD command. Note: <acceptAnyRemote> must be equal to 2 to allow this parameter
<rPort>	integer		Remote host port to contact. If <rPort> parameter is not passed, this value is taken from +SQNSD command. [0-65535] Note: <acceptAnyRemote> must be equal to 2 to allow this parameter.
<RAI>	Integer		Note: This parameter applies only for NB-IoT applications. RAI field (Release Assistance Information) allows the UE to notify the MME if no further uplink or downlink data transmissions are expected (RAI=1), or only a single downlink data transmission subsequent to this uplink data transmission is expected (RAI=2) [0-2]

Values:

- 0 : No information
- 1 : No further uplink or downlink data transmissions are expected Socket suspended
- 2 : Only a single downlink data transmission subsequent to this uplink data transmission is expected

**AT+SQNSSEND=?**

Test command returns supported values of the parameter

```
+SQNSSEND:(1-6),[(0-65535),<IPaddr>,(0-2)]
```

```
OK
```



```
at+sqnssend=?
```

```
+SQNSSEND:(1-6),[(0-65535),<IPaddr>,(0-2)]
```

```
OK
```

```
at+sqnssend=1
```

```
>hello
```

```
OK
```

3.1.19. AT+SQNSSENDEXT - Extended Send Data In Command

This command allows, while the module is in command mode, to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

The device responds to the command with the prompt '>' (<greater_than> sign and <space> character) and waits for the data to send.

When <bytetosend> bytes have been sent, then the operation is automatically completed.

If data is successfully received by the modem, then the response is OK. If data reception by the modem fails for some reason, then an error code is reported. Note that this response does not reflect any processing at network/eNB level.



Input data format is raw binary by default. It is configurable using AT+SQNSCFGEXT command.

1. The maximum number of bytes to send is 1500.
2. It is possible to use +SQNSSENDEXT only if the connection was opened by +SQNSD, else the UE will raise an error.
3. All special characters are sent like generic bytes. A byte corresponding to BS character (0x08) is sent through the socket and doesn't behave like a back space. Therefore, the previous byte will not be deleted



AT+SQNSSENDEXT=<connId>,<bytesToSend>[,<RAI>]

Intermediate result code: >

OK

ERROR

NO CARRIER

+CME ERROR:<err>

Parameters:

Name	Type	Default	Description
<connId>	integer		Socket connection identifier [1-6]
<bytesToSend>	integer		Number of bytes to send [1-1500]
<RAI>	Integer		RAI field (Release Assistance Information) allows the UE to notify the MME if no further uplink or downlink data transmissions are expected (RAI=1), or only a single downlink data transmission subsequent to this uplink data transmission is expected (RAI=2) [0-2] Note: This parameter applies only for NB-IoT applications.

Values:

- 0 : No information
- 1 : No further uplink or downlink data transmissions are expected
- 2 : Only a single downlink data transmission subsequent to this uplink data transmission is expected



AT+SQNSSENDEXT=?

Test command returns supported values of the parameter

+SQNSSENDEXT:(1-6),[(0-1500),<IPAddr>,(0-2)]

OK

```
</> at+sqnssendext=?  
+SQNSSENEXT: (1-6),(1-1500)[,(0-2)]  
OK  
at+sqnssendext=1,11  
>hello again
```

3.2. Device Configuration Commands

3.2.1. AT^RESET - Hard Reset

Immediate module reboot.



AT^RESET

Execution command reboots immediately the unit.

3.2.2. AT+CCLK - Clock Management

The command is related to real time clock management.



3GPP TS 27.007



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
- ±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>

- i** The three last characters of <time>, i.e. the time zone information, are returned by AT+CCLK? only if the #NITZ URC 'extended' format has been enabled (see #NITZ).



AT+CCLK=?

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



```
Set date and time:  
AT+CCLK="02/09/07,22:30:00+00"  
OK  
Read date and time:  
AT+CCLK?  
+CCLK: "02/09/07,22:30:25"  
OK
```

3.2.3. AT+CFUN - Set Phone Functionality

This command selects the level of functionality in the ME.



3GPP TS 27.007



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

Set command selects the level of functionality in the ME.

Parameters:

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

Values:

- 0 : minimum functionality (low power mode)
- 1 : mobile full functionality
- 2 : disable both TX
- 3 : disable both RX
- 4 : disable phone both transmit and receive RF circuits
- 5..127 : Reserved for manufacturers as intermediate states between full and minimum functionality

<rst>	integer	0	reset flag
-------	---------	---	------------

Values:

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



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



AT+CFUN?

Read command reports the current setting of <fun>.



AT+CFUN=?

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

3.2.4. AT+CLAC - Available AT Commands

This command shows the available AT commands list.



3GPP TS 27.007



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.

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

The command sets the speed of the DTE serial port.



- [1] Hardware User's Guide of the used module
- [2] ITU-T Recommendation V25 ter



AT+IPR=<rate>

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

Parameter:

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

Values:

- 300 : bps
- 600 : bps
- 1200 : bps
- 2400 : bps
- 4800 : bps
- 9600 : bps
- 19200 : bps
- 38400 : bps
- 57600 : bps
- 115200 : bps
- 230400 : bps
- 921600 : bps
- 2900000 : bps
- 3000000 : bps
- 3200000 : bps
- 4000000 : bps



AT+IPR?

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



AT+IPR=?

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

+IPR:(list of supported auto detectable <rate> values), (list of fixed-only <rate> values)



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



- Read syntax

+IPR?

The DCE shall transmit a string of information text to the DTE, consisting of +IPR:<rate>.

- **+IPR:0** if set for automatic rate detection.
- **+IPR:9600** if set to 9600 bit/s.

- Test syntax

+IPR=?

The DCE shall transmit one or two strings of information text to the DTE, consisting of +IPR:(list of supported autodetectable <rate>values)[,(list of fixed-only <rate> values)]

+IPR:(0,300,1200,2400,4800,9600),(19200,38400,57600) if the DCE can autodetect up to 9600 bit/s and can support three additional higher fixed rates.

3.2.6. AT+SCPWD - Change PIN with <aid>

This command allows changing PIN with aid.



AT+SCPWD=<pin>,<newPin>[,<aid>]<fac>,<pin>,<newPin>[,<aid>]

Set command sends to the device a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN required is SIM PUK or SIM PUK2, the <newpin> is required. The <newpin> will replace the old pin in the SIM.

Parameters:

Name	Type	Default	Description
<fac>	string	-	Facility type. Only the facility "SC" is supported
<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
<aid>	string	-	Application ID, if omitted USIM application is used



AT+SCPWD="SC", 1234,5678,A0000000871004010203040506070809
OK

3.2.7. AT+SMDTH - RF Thermistor Measurement



AT+SMDTH=[*crnti*][,*txPsd*,*txMode*]

The command provides thermistor measurement block which gives an absolute value of the temperature.

+SMDTH:temperature

+SMT ERROR: err

Parameters:

Name	Type	Default	Description
< temperature >	string	-	Measured temperature in degrees Celsius. -1 error code otherwise.
< err >	string	-	NA : Temperature service is not available for this RFIC chip. ONGOING: Measurement is on-going



AT+SMDTH=?

3.2.8. AT+SQNAUTOCONNECT - Auto-Connect



AT+SQNAUTOCONNECT=<autoconnect>[,forceautoconnect]

The set command changes the autoconnect mode of the device. When enabled, the device will automatically set the UE to its maximal functionality (equivalent to AT_CFUN=1) after each reboot. This setting is persistent across reboot.

Parameters:

Name	Type	Default	Description
< autoconnect >	Integer	-	Autoconnect is disabled or enabled
< forceautoconnect >	integer	-	ForceAutoconnect if disabled, the Autoconnect is overridden to 0 in case of "3gpp-conformance", "Verizon-conformance" or ForceAutoconnect is enabled



AT+SQNAUTOCONNECT?

Read command returns the current autoconnect mode.

```
+SQNAUTOINTERNET: <autointernet>
OK
```



AT+SQNAUTOCONNECT=?

The test command returns the possible autoconnect values.

```
+SQNAUTOCONNECT: (0,1),(0,1)
OK
```



AT+SQNAUTOCONNECT=1

```
OK
Enable autoconnect.
```

```
AT+SQNAUTOCONNECT?
+SQNAUTOCONNECT: 1
OK
Read the current autoconnect setting.
```

3.2.9. AT+SQNAUTOINTERNET - Internet Auto-Connect



AT+SQNAUTOINTERNET=<autointernet>

The set command changes the autointernet mode of the device. When enabled, the device will automatically try to connect internet PDN provisioned into /etc/config/sqnm after each attach to the network.

This setting is persistent across reboot.

Parameters:

Name	Type	Default	Description
< autointernet >	Integer	-	Autointernet is disabled or enabled

AT+SQNAUTOINTERNET?

The read command returns the current autointernet mode.

+SQNAUTOINTERNET: <autointernet>

OK

AT+SQNAUTOINTERNET=?

The test command returns the possible autointernet values.

+SQNAUTOINTERNET:(0,1)

OK

3.2.10. AT+SQNCFGDPR - Configure Dynamic Power Reduction parameters



AT+SQNCFGDPR=<band>,<backoff>

The set command configures the parameters associated to the Dynamic Power Reduction for body SAR algorithm.

Parameters:

Name	Type	Default	Description
< band >	Integer	-	Represents the band to which the Dynamic Power Reduction for body SAR algorithm will be applied, Any of the bands supported by the device can be selected.
< backoff >	integer	-	Represents the backoff to be applied to this band. The backoff unit is 1/100 dB.



AT+SQNCFGDPR?

The read command gets the list of configured band/backoff couples.

```
+SQNCFGDPR=<band1,backoff1>,...,<band_n,backoff_n>
OK
```



AT+SQNCFGDPR=?

The test command provides the list of supported bands along with the maximum backoff that can be set.

```
+SQNCFGDPR=<band1,...,band_n>, <maximum backoff>
OK
```



AT+SQNCFGDPR=4,100

OK

Set 1dB backoff to the LTE Band 4.

AT+SQNCFGDPR?

```
+SQNCFGDPR: 4,100
```

OK

Read Dynamic Power Reduction for body SAR parameters.

3.2.11. AT+SQNCLI - Send CLI to sequansd



AT+SQNCLI="<cli>"

This command send a CLI command to sequansd through an AT command.



This command line interface (CLI) is a set of commands that allows access to certain UE LTE firmware functions. Refer to the CLI Reference Manual for a list of CLI commands.

3.2.12. AT+SQNCTM - Conformance Test Mode:



AT+SQNCTM=<ctm>

The set command changes the conformance test mode of the device.

Parameters: <ctm>

Value	Description
"standard"	Standard 3GPP mode
"3gpp-conformance"	Standard 3GPP mode to pass GCF tests
"operator_name"	Test mode related to a specific supported operator Note: Please use AT_SQNCTM=? To confirm the list of the operators supported in the current software release.
Other values	Reserved



AT+SQNCTM?

Read command returns the current conformance test mode.

```
+SQNCTM: <ctm>
OK
```



AT+SQNCTM=?

Test command returns the supported conformance test modes.

```
+SQNCTM: ("standard", "3gpp-conformance", list of supported operators)
OK
```



Change the conformance test mode to "3gpp-conformance" to run PS tests:

```
AT+SQNCTM="3gpp-conformance"
```

```
OK
```

```
AT^RESET
```

Read the current conformance test mode:

```
AT+SQNCTM?
```

```
+SQNCTM: "3gpp-conformance"
```

```
OK
```

3.2.13. AT+SQNDPRMODE - Set Dynamic Power Reduction:



AT+SQNDPRMODE=<mode>

The set command defines the enabling mode of the Dynamic Power Reduction for Body SAR algorithm.

Parameters: <mode>

Value	Description
0	Dynamic Power Reduction for Body SAR is driven by a hardware GPIO (defined in PSI configuration). Please check the Hardware Platform User Guide for further information.
1	Dynamic Power Reduction for Body SAR is enabled by default
2	Dynamic Power Reduction for Body SAR is disabled by default



AT+SQNDPRMODE?

Read command provides the enabling mode of the Dynamic Power Reduction for Body SAR algorithm.

+SQNDPRMODE=<mode>

OK



AT+SQNDPRMODE=?

The test command provides all possible enabling modes of the Dynamic Power Reduction for Body SAR algorithm

+SQNDPRMODE=0, 1, 2

OK

3.2.14. AT+SQNSFACTORYRESET - Device Reset to Factory State:



AT+SQNSFACTORYRESET

+CME ERROR : <err>

Set command causes device to reset to factory state. A device reboot is necessary to finalize the reset to factory state.



AT+ SQNSFACTORYRESET =?

OK



The manufacturing command AT+PSISAVECURRENT must be used during the manufacturing process to define the restoration point for the AT+SQNSFACTORYRESET. Please refer to mTools Reference Manual for more details.

3.2.15. AT+SQNSNVR - Read Data in NVM:



AT+SQNSNVR="certificate",<index>,<size><CR><LF><data>

+SQNSNVR:<type>...<type>... [...]]<CR><LF>+SQNSNVR: <type>...[...]]
OK

AT+SQNSNVR="privatekey"[,<index>]
+SQNSNVR:<index>,
"-----BEGIN RSA PRIVATE KEY-----<CR><LF>
"<8 first bytes> [...] <8 last bytes>"
"-----END RSA PRIVATE KEY-----
[<CR><LF>
+SQNSNVR:<index>,
"-----BEGIN RSA PRIVATE KEY-----<CR><LF>"<8 first bytes>
[...] <8 last bytes>"
"-----END RSA PRIVATE KEY-----[...]]
OK

This command allows to read data (certificate, private key) stored in the non-volatile (NV) memory or the Flash File System.

Parameters:

Name	Type	Default	Description
<type>	string	-	Type of data. "certificate": Certificate data. "privatekey": Private key.
<index>	integer	-	Certificate index. [0-19]
<issuer>	string		Certificate issuer (Entity that verified the information and issued the certificate)
<serial-number>	string		Certificate serial number (used to uniquely identify the certificate)
<subject>	string		Certificate subject (person or entity identified)
<valid-from>	string		Certificate validity period start
<valid-to>	string		Certificate expiration date
<signature-algorithm>	string		Certificate signature algorithm (Algorithm used to create the signature)
<signature>	string		Certificate signature (Actual signature to verify that it came from the issuer)
<thumbprint-algorithm>	string		Certificate thumbprint algorithm (algorithm used to hash the public key certificate)
<thumbprint>	string		Certificate thumbprint (The hash itself, used as an abbreviated form of the public key certificate)



The commands +SQNSNVR and +SQNSNVW allow reading and writing data (certificate, private key) from/to the non-volatile (NV) memory or from/to the Flash File System. Data stores in Non-Volatile Memory will be persistent against device reboot and software upgrade.



AT+SQNSNVR?

Read command usage and syntax vary depending on the type of stored data.



AT+SQNSNVR="certificate"[,<index>]

This command with "certificate" type should be used to dump all certificate stored in the system. If <index> is provided, only certificate with given <index> is displayed. An ERROR is reported in case this entry is empty. If <index> is not provided, then all available certificates are displayed, one per line.

AT+SQNSNVR="privatekey"

This command with "privatekey" type should be used to dump all the **private keys stored in the system. Only the first 8 bytes and the last 8**



- Read certificate @ index 5

```
AT+SQNSNVR="certificate",5
```

```
+SQNSNVR:
```

```
"certificate",5,<issuer>,<serial-number>,<subject>,<valid-from>,<valid-to>,<signature-algorithm>,<signature>,<thumbprint-algorithm>,<thumbprint>
```

```
OK
```

- Read all certificates:

Note: All certificate data is not displayed in the example below.

Shortened sections are identified by "(...)".

```
AT+SQNSNVR="certificate"
```

```
+SQNSNVR: "certificate",0,"/C=US/O=VeriSign, Inc./OU=VeriSign
```

```
Trust Network/OU=(c) 2006 VeriSign, Inc. - For authorized use only/CN=VeriSign Class 3 Public Primary Certification Authority -
```

```
G5","0000(...)00000","/C=US/O=VeriSign, Inc./OU=VeriSign Trust
```

```
Network/OU=(c) 2006 VeriSign, Inc. - For authorized use
```

```
only/CN=VeriSign Class 3 Public Primary Certification Authority -
```

```
G5","06/11/08 00:00:00","36/07/16
```

```
23:59:59","sha1RSA","0000(...)0000","sha1","b054ec81256dc47f1f036
```

```
0e38fe30d6ccba35424"
```

```
+SQNSNVR: "certificate",1,"/OU=Amazon Web Services O=Amazon.com
```

```
Inc. L=Seattle ST=Washington
```

```
C=US","0000000(...)0000000000","/CN=AWS IoT
```

```
Certificate","18/01/03 07:06:00","49/12/31
```

```
23:59:59","sha256RSA","000000(...)0000","sha1","f6bb69bdc40afedb8
```

```
40e6854749db37c74501e6b"
```

```
OK
```

- read a single private key:

```
AT+SQNSNVR="privatekey",2
```

```
+SQNSNVR: 1,"-----BEGIN RSA PRIVATE KEY-----
```

```
MIIFQTCC [...] 4PsJYGw=
```

```
-----END RSA PRIVATE KEY-----
```

3.2.16. AT+SQNSNVW - Write Data in NVM:

This command allows to write/delete data (Certificate, etc.) to/from the non-volatile (NV) memory.

Write command usage & syntax may change depending on the type of data to store.

`AT+SQNSNVW="certificate",<index>,<size><CR><LF><data>`

This write command with "certificate" type should be used to write certificate in non volatile memory. After upload, public certificates are immediately available for all client secured IP connection (+SQNSUPGRADE, Secured socket). For secured socket in server mode, certificate <index> should be used to assign private certificate to secure server. An <index> should be provided and will be used by the system to identify in a unique way the certificate for future operations (delete, etc.)

<size> parameter corresponds to the exact number of bytes of the certificate to upload: after AT+SQNSNVW write command issued, user should send certificate bytes in PEM (Privacy-enhanced Electronic Mail) format. As soon as <size> bytes have been received, operation is automatically completed. If certificate is successfully uploaded and verified, then the response is OK. If certification upload fails for some reason, then an error code is reported.

To delete a certificate, one should simply write a 0 byte certificate using certification ID as <index>.

`AT+SQNSNVW="privatekey",<index>,<size><CR><LF><data>`

This write command with "privatekey" type will write a private key in PEM format to the non-volatile memory.



AT+SQNSNVW=<type>,...
OK

AT+SQNSNVW="certificate",<index>,<size><CR><LF><data>
OK

AT+SQNSNVW="privatekey",<index>,<size><CR><LF><data>
OK

Parameters:

Name	Type	Default	Description
<type>	string	-	Type of data. "certificate": Certificate data. "privatekey": Private key.
<index>	integer	-	Certificate index. [0-19]
<size>	integer		Size in bytes of certificate file to upload or `0` to remove.



The commands +SQNSNVR and +SQNSNVW allow reading and writing data (Certificate, etc.) from/to the non-volatile (NV) memory or from/to the Flash File System. Data stores in Non-Volatile Memory will be persistent against device reboot and software upgrade.



Private RSA keys with password are not supported.



The MQTT broker may provide certificates and private keys files with CRLF (carriage return and line feed) line-ending. But the <size> of the certificate or the private key must be a size of the appropriate file after removing CR (carriage return) from it. To remove CR (carriage return) use the following command on

Linux:
`tr -d \015 < file_with_cr > no_cr_file`

**AT+SQNSNVW?**

OK

**AT+SQNSNVW=?****+SQNSNVW: "certificate",(list of supported <index>),(list of supported <size>)**

OK



• Certificate upload @ index 5:

AT+SQNSNVW="certificate",5,1346**-----BEGIN CERTIFICATE-----****MIIDXTCCAkWgAwIBAgIJAJC1HiIAZaiIMA0GCSqGSIb3DfBAYTAKFVMRMwEQYDVQQ****IDApTb21ILVN0YXRIMSEwHwYDVx[...]C3Fayua4DRHyZOLmlvQ6tlChY0CIXXuefbm****VSDeUHwc8YuB7xt8BVc69rLeHV15A0qyx77CLSj3tCx2IUXVqRs5mISbvA==****-----END CERTIFICATE-----**

OK

• Remove certificate @ index 5:

AT+SQNSNVW="certificate",5,0

OK

• Upload client private key with keyid 2:

\$ at+sqnsnvw="privatekey",2,1675**> -----BEGIN RSA PRIVATE KEY-----**

...

-----END RSA PRIVATE KEY-----

OK

3.2.17. AT+SQNSSHDN - Device Shutdown:



AT+SQNSSHDN
+CME ERROR : <err>

Set command causes device detach from the network and shutdown. Before definitive shutdown an OK response is returned. After the issuing of this command, any previous activity is terminated and the device will not respond to any further command.



AT+SQNSSHDN=?
OK

3.2.18. ATE - Command Echo

This command allows to enable or disable the command echo.



ITU-T Recommendation V.25 ter



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**

3.2.19. ATV - Response Format

This command allows to set format of information responses and result codes.



[1] ITU-T Recommendation V.25 ter



ATV[<n>]

Set command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines if result codes are transmitted in a numeric form or an alphanumeric form (according to [1]).

Parameter:

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

Values:

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

Additional info:

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

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

3.3. Device Identification Commands

3.3.1. AT+CGMI - Request Manufacturer Identification

This command is described in 3GPP TS 27.007. See Section References. See also +GMI command



3GPP TS 27.007

Execution command causes the TA to return one or more lines of information text <manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.



AT+CGMI <manufacturer>

+CME ERROR: <err>

Execution command causes the TA to return one or more lines of information text <manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to.

Parameters:

Name	Type	Default	Description
<manufacturer>	string		The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>



AT+CGMI=?

3.3.2. AT+CGMM - Subscriber Number

This command is described in 3GPP TS 27.007. See Section References. See also +GMM command



3GPP TS 27.007

Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.



AT+CGMM <model>

+CME ERROR: <err>T+CGMM

Execution command causes the TA to return one or more lines of information text <model>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to.

Parameters:

Name	Type	Default	Description
<model>	string		The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>



AT+CGMM=?

3.3.3. AT+CGMR - Request Revision Identification

This command is described in 3GPP TS 27.007. See Section References. See also +GMR command



3GPP TS 27.007

Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired.



AT+CGMR <revision>

+CME ERROR: <err>T+CGMM

Execution command causes the TA to return one or more lines of information text <revision>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected to.

Parameters:

Name	Type	Default	Description
<revision>	string		The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>



AT+CGMR=?

3.3.4. AT+CGSN - Request Product Serial Number Identification

This command is described in 3GPP TS 27.007. See Section References. See also +GSN command



3GPP TS 27.007

See also 5.8 Mobile Termination Error Result Code: +CME ERROR on page 109 for <err> values.



AT+CGSN [=<snt>]

+CME ERROR: <err>T+CGMM

Execution 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.

Parameters:

Name	Type	Default	Description
<snt>	integer		Indicating the 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)	
<sn>	string		one or more lines of information text determined by the MT manufacturer. Typically, the text will consist of a single line containing the IMEI number of the MT, but manufacturers may choose to provide more information if desired. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>
<IMEI>	string		String type in decimal format indicating the IMEI; refer 3GPP TS 23.003 [7], subclause 6.2.1. IMEI is composed of Type Allocation Code (TAC) (8digits), 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; refer 3GPP TS 23.003 [7], subclause 6.2.2. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) ETSI 3GPP TS 27.007 version 12.10.0 Release 12 23 ETSI TS 127 007 V12.10.0 (2015-10) 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; refer 3GPP TS 23.003 [7], subclause 6.2.2. This allows identifying different software versions of a given mobile. Character set used in <svn> is as specified by command Select TE Character Set: +CSCS. Note: The default value <snt>=0 returns the information text <sn> with no command name prefixed. This has been done to retain backward compatibility. All other values of <snt> return the information text including command name prefix.



AT+CGSN=? (when TE supports <snt> and command successful:)

+CGSN:

OK



• To get <sn> which returns IMEI of the MT

AT+CGSN

490154203237518

OK

• To get <imei> which returns IMEI of the MT

AT+CGSN=1

+CGSN: "490154203237518"

OK

3.3.5. AT+CIMI - Request International Mobile Subscriber Identity

This command is described in 3GPP TS 27.007. See Section References.



3GPP TS 27.007

See also 5.8 Mobile Termination Error Result Code: +CME ERROR on page 109 for <err> values.



AT+CIMI <IMSI>

+CME ERROR: <err>

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT.

Parameters:

Name	Type	Default	Description
<IMSI>	string		String (without double quotes). International Mobile Subscriber Identity




AT+CGMR=?

3.4. Device Upgrade Commands

3.4.1. AT+SQNSUPGRADE - Device Upgrade

The write command used to trigger device upgrade with a firmware located either in the device filesystem or fetched from an external server. The parameters <reboot>, <report_progress> and <command> are optional. A device reboot is necessary to finalize the system upgrade. Any kind of reboot is acceptable (AT^RESET, AT+SQNSSHDN, hardware reset). <reboot> parameter controls automatic reboot after download firmware has been validated and installed. Upgrade can be launched in foreground or background as specified by <command> value. User can cancel upgrade by sending cancel <command> any time before device reboot. An unsolicited result code +SQNSUPGRADE: "installed" is generated as soon as firmware download is complete and verified, stating device is ready for reboot. <report_progress> controls presentation of unsolicited result code +SQNSUPGRADE: "downloading".

The write command is also used in case of manual network initiated firmware upgrade, to control firmware upgrade operation timings: the user calls this command to trigger the firmware upgrade and/or to cancel the operation.

 **AT+SQNSUPGRADE=<firmware_url>[,<reboot>[,<report_progress>[,<command>]]]**
+CME ERROR:<err>

Parameter:

Name	Type	Default	Description
<firmware_url>	string		URL (compliant with RFC1738) of the firmware (protocol://user:password@host:port/path). An example is: <ul style="list-style-type: none"> https://sqn:pass@www.sequans.com/private/firmware.sfp for LR4.x software releases https://sqn:pass@www.sequans.com/private/firmware.dup for LR5.x and LR6.x software releases
<reboot>	integer	1	Values: <ul style="list-style-type: none"> 0 : No reboot after the firmware is installed. The user must reboot explicitly the device to take into account the new firmware 1 : Reboot automatically after the firmware is installed
<report_progress>	integer		Values: <ul style="list-style-type: none"> 0 : Don't report download progress 1..100 : report download progress using +SQNSUPGRADE: "downloading", <percent_downloaded> URC.
<command>	integer	0	Values: <ul style="list-style-type: none"> 0 : Synchronous upgrade 1 : Start asynchronous upgrade. Launch an asynchronous upgrade. The command launches the upgrade and returns immediately - with OK if upgrade is started correctly or CME ERROR (see below for specific error codes). The command report upgrade progress with +SQNSUPGRADE URC.

- 2 : Cancel upgrade.
Cancel upgrade if any or do nothing, then returns OK. In case of Network Initiated firmware upgrade, then the network will be notified with upgrade cancel error code.

**<upgrade
_state>**

Values:

- “canceled” : The upgrade has been canceled
- “downloading” : Report the downloading progress. This state is followed with <percent_downloaded>. This information is displayed only if <report_progress> has been set different than 0
- “idle” : No upgrade is on going
- “installed” : The upgraded is installed and will be effective after the next reboot
- “available” : A new firmware is available for download (network initiated firmware upgrade use cases only)
- “rebooting” : This notification is sent just before the device reboot that finalizes the system upgrade.

**<percent_
Downloaded>** integer Percentage of image downloaded. [0-100]



AT+SQNSUPGRADE?

Read command returns the status of result code presentation corresponding to the current state of upgrade process

SQNSUPGRADE:<upgrade_state>[,...]



AT+ SQNSUPGRADE =?

SQNSUPGRADE:(max string length of <firmware_url>),(list of supported<reboot>s),(range of supported <report_progress>),(list of supported <command>s)



AT+SQNSUPGRADE?

+SQNSUPGRADE: "idle"

OK

The following error codes may be returned through +CME ERROR. They are also listed in

Table 4-5: +SQNSUPGRADE Specific Error Codes

Code	Description
528	Upgrade failed: General error
529	Upgrade failed: Corrupted image
530	Upgrade failed: Invalid signature
531	Upgrade failed: Network error
532	Upgrade failed: Upgrade already in progress
533	Upgrade cancel failed: No upgrade in progress

3.4.2. AT+SQNSUPGRADECFG - Device Upgrade Configuration

The write command is used to configure the device behavior in case of network-initiated firmware upgrade configuration. This is typically the case for OTADM FOTA. The level of interaction with the user or the external host is configured by the <mode> parameter. Two modes are defined: automatic (default) and manual. The manual mode is currently not available.

In automatic mode, the network-initiated firmware upgrade operates in background of the regular module operation. After the completion of the new firmware download, the module will automatically apply the new firmware and then reboot.

After the reboot, the module will send a status to the upgrade server, with respect to the Over-The-Air firmware upgrade protocol. The user is notified of the upgrade progress (firmware downloading, firmware installed, upgrade canceled, rebooting) by +SQNSUPGRADE unsolicited result codes, as defined by the notification level configuration (<report> and <report_progress>) parameters.

Attention: A reboot of the device is necessary to take into account <mode> configuration change. Any kind of reboot (AT^RESET, AT+SQNSSHDN, hardware reset) is acceptable.



AT +SQNSUPGRADECFG=<mode>,<report>,<report_progress>
+CME ERROR:<err>

Parameter:

Name	Type	Default	Description
<mode>	integer	0	
	Values:		
	0	:	Automatic mode. Network initiated firmware upgrade is fully transparent for the user. Note that an unsolicited reboot can happen anytime to complete the upgrade procedure.
	1	:	Manual mode. This mode is currently not supported.
<report>	integer	0	
	Values:		
	0	:	Do not report any upgrade status
	1	:	Activate upgrade status main step reporting (see <upgrade_state> values of +SQNSUPGRADE URC).
<report_progress>	integer	0	
	Values:		
	0	:	Do not report download progress
	1..100	:	report download progress using +SQNSUPGRADE: "downloading",<percent_downloaded> URC.



AT+SQNSUPGRADECFG?

Read command returns the current configuration.

SQNSUPGRADECFG:<mode>,<report>,<report_progress>



AT+ SQNSUPGRADE =?

SQNSUPGRADECFG:(list of supported <mode>s),(list of supported <report>s),(range of supported <report_progress>)

3.5. Network Services Commands

3.5.1. AT+BGLTEPLMN - Background Search for LTE PLMNs

This instruction is similar to the AT+COPS=? command. The key difference is that only RSRP (a measurement of the signal strength of an LTE cell) is used to search LTE networks and report applicable networks. Another difference between the commands is that AT+BGLTEPLMN=? can be used even when no SIM card is present.

AT+BGLTEPLMN=?

Additional info:

►► **+BGLTEPLMN: [list of supported (stat, long_oper, short_oper, num_oper[,act,rsrp]) [, list of supported (format)]**

Name	Type	Default	Description
<stat>	integer	N/A	Status.
	Values:		
	0	:	Unknown
	1	:	Available
	2	:	Current
	3	:	Forbidden
<long_oper>	string	-	Long alphanumeric format of the operator name: up to 16 characters.
<short_oper>	string	-	Short alphanumeric format of the operator name: up to 8 characters (refer to GSM MoU SE.13).
<num_oper>	integer	-	Numeric format: the GSM Location Area Identification number (refer to 3GPP TS 24.008 subclause 10.5.1.3). Country code with three BCD digits coded as in ITU-T Recommendation E.212 Annex A, plus a two BCD digit network code, which is administration specific. The returned num_oper value is not in BCD format, but in IRA characters converted from BCD, so the number has the following format: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 1)
<act>	integer	-	describing the selected Access Technology (AcT):
	Values:		
	0	:	GSM
	1	:	GSM Compact
	2	:	UTRAN
	3	:	GSM with EGPRS
	4	:	UTRAN with HSDPA
	5	:	UTRAN with HSUPA
	6	:	UTRAN with HSDPA and HSUPA
	7	:	E-UTRAN
<rsrp>	integer	-	RSRP value, in hundredths of dBm.
<format>	integer	-	describing a supported format of network operator identifier:
	Values:		
	0	:	Long alphanumeric string
	1	:	Short alphanumeric string
	2	:	Numeric identifier

3.5.2. AT+CEER - Extended Error Report



3GPP TS 27.007



AT+CEER

Execution command causes the TA to return one or more lines of information text <report>, determined by the MT manufacturer, which should offer the user of the TA an extended report of the reason for:

- the failure in the last unsuccessful call setup (originating or answering) or in call modification;
- the last call release;
- the last unsuccessful GPRS attach or unsuccessful PDP context activation;
- the last GPRS detach or PDP context deactivation.

Typically, the text will consist of a single line containing the cause information given by GSM/UMTS network in textual format.

+CEER: <report>

Additional info:

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

Name	Type	Default	Description
<report>	integer	-	The total number of characters, including line terminators, in the information text shall not exceed 2041 characters. Text shall not contain the sequence 0<CR> or OK<CR>.



AT+CEER=?

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

3.5.3. AT+CEREG - EPS Network Registration Status



[1] 3GPP TS 24.007



AT+CEREG=<n>

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN, or unsolicited result code +CEREG: <stat>,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in E-UTRAN. The parameters <AcT>, <tac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [<cause_type>,<reject_cause>], when available, when the value of <stat> changes.

Parameter:

Name	Type	Default	Description
<n>	integer	0	

Values:

- 0 : disable the network registration unsolicited result code
- 1 : enable network registration unsolicited result code +CEREG: <stat>
- 2 : enable network registration and location information unsolicited result code +CEREG: <stat>,[<tac>],[<ci>],[<AcT>]]
- 3 : enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>,[<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]]
- 4 : For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>,[<tac>],[<ci>],[<AcT>],[<Active-Time>],[<Periodic-TAU>]]]]
- 5 : For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG:<stat>,[<tac>],[<ci>],[<AcT>],[<cause_type>],[<reject_cause>],[<Active-Time>],[<Periodic-TAU>]]]]

Unsolicited fields:

Name	Type	Description
<stat>	integer	Indicates the EPS registration status.

Values:

- 0 : not registered, MT is not currently searching an operator to register to
- 1 : registered, home network
- 2 : not registered, but MT is currently trying to attach or searching an operator to register to
- 3 : registration denied
- 4 : unknown (e.g. out of E-UTRAN coverage)
- 5 : registered, roaming
- 6 : registered for "SMS only", home network (not applicable)

		7 : registered for "SMS only", roaming (not applicable)
		8 : attached for emergency bearer services only (See NOTE 2)
		9 : registered for "CSFB not preferred", home network (not applicable)
		10 : registered for "CSFB not preferred", roaming (not applicable)
<tac>	string	two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).
<ci>	string	four byte E-UTRAN cell ID in hexadecimal format
<AcT>	integer	The parameter sets/shows the access technology of the serving cell. Values: 0 : GSM (not applicable) 1 : GSM Compact (not applicable) 2 : UTRAN (not applicable) 3 : GSM w/EGPRS (see NOTE 3) (not applicable) 4 : UTRAN w/HSDPA (see NOTE 4) (not applicable) 5 : UTRAN w/HSUPA (see NOTE 4) (not applicable) 6 : UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) 7 : E-UTRAN
<cause_type>	integer	Indicates the type of<reject_cause>. Values: 0 : Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A. 1 : Indicates that <reject_cause> contains a manufacturer-specific cause.
<reject_cause>	integer	contains the cause of the failed registration. The value is of type as defined by <cause_type>.
<Active-Time>	string	one byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].
<Periodic-TAU>	string	one byte in an 8 bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].



If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

NOTE 2: 3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services.

NOTE 3: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

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



AT+CREG?

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>, <ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3.

When <n>=0, 1, 2 or 3 and command successful:

+CREG: <n>,<stat>[,<tac>],[<ci>],[<AcT>[,<cause_type>,<reject_cause>]]]

When <n>=4 or 5 and command successful:

+CREG: <n>,<stat>[,<lac>],[<ci>],[<AcT>],[<rac>][, [,<cause_type>],[<reject_cause>][, [,<Active-Time>],[<Periodic-TAU>]]]]]



AT+CREG=?

Test command returns values supported as a compound value.

+CREG: (list of supported <n>s)

3.5.4. AT+CESQ - Extended Signal Quality



[1] 3GPP TS 27.007



AT+CESQ

Execution command returns received signal quality parameters. If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> is set to 255. If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255.

If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.

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

Additional info:



Name	Type	Default	Description
<rxlev>	integer	N/A	Received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).
Values:			
0	:	rsi < -110 dBm	
1	:	-110 dBm ≤ rssi < -109 dBm	
2	:	-109 dBm ≤ rssi < -108 dBm	
...	:	...	
61	:	- 50 dBm ≤ rssi < - 49 dBm	
62	:	- 49 dBm ≤ rssi < -48 dBm	
63	:	- 48 dBm ≤ rssi	
99	:	not known or not detectable	
<ber>	integer	N/A	Channel bit error rate (in percent)
Values:			
0÷7	:	as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4	
99	:	not known or not detectable	
<rscp>	integer	N/A	Received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3).
Values:			
0	:	rscp < -120 dB	
1	:	-120 dBm ≤ rscp < -119 dBm	

- 2 : $-119 \text{ dBm} \leq \text{rscp} < -118 \text{ dBm}$
- ... : ...
- 94 : $-27 \text{ dBm} \leq \text{rscp} < -26 \text{ dBm}$
- 95 : $-26 \text{ dBm} \leq \text{rscp} < -25 \text{ dBm}$
- 96 : $-25 \text{ dBm} \leq \text{rscp}$
- 255 : not known not detectable

<ecno> integer N/A Ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause).

Values:

- 0 : $\text{Ec/lo} < -24 \text{ dBm}$
- 1 : $-24 \text{ dBm} \leq \text{Ec/lo} < -23.5 \text{ dBm}$
- 2 : $-23.5 \text{ dBm} \leq \text{Ec/lo} < -23 \text{ dBm}$
- ... : ...
- 47 : $-1 \text{ dBm} \leq \text{Ec/lo} < -0.5 \text{ dBm}$
- 48 : $-0.5 \text{ dBm} \leq \text{Ec/lo} < 0 \text{ dBm}$
- 49 : $0 \text{ dBm} \leq \text{Ec/lo}$
- 255 : not known not detectable

<rsrq> integer 0 Reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7).

Values:

- 0 : $\text{rsrq} < -19.5 \text{ dBm}$
- 1 : $-19.5 \text{ dBm} \leq \text{rsrq} < -19 \text{ dBm}$
- 2 : $-19 \text{ dBm} \leq \text{rsrq} < -18.5 \text{ dBm}$
- ... : ...
- 32 : $-4 \text{ dBm} \leq \text{rsrq} < -3.5 \text{ dBm}$
- 33 : $-3.5 \text{ dBm} \leq \text{rsrq} < -3 \text{ dBm}$
- 34 : $-3 \text{ dBm} \leq \text{rsrq}$
- 255 : not known not detectable

<rsrp> integer 0 Reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4).

Values:

- 0 : $\text{rsrp} < -140 \text{ dBm}$
- 1 : $-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$
- 2 : $-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$
- ... : ...
- 95 : $-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$
- 96 : $-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$
- 97 : $-44 \text{ dBm} \leq \text{rsrp}$

255 : not known not detectable



AT+CESQ=?

Test command returns values supported as compound values.

+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s)

3.5.5. AT+CIND - Indicator Control



3GPP TS 27.007



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

Set command is used to set the values of MT indicators. <ind> value 0 means that the indicator is off (or in state which can be identified as "off" state), 1 means that indicator is on (or in a state which is more substantial than "off" state), 2 is more substantial than 1, and so on. If the indicator is a simple on/off style element, it has values 0 and 1. The number of elements is MT specific. If MT does not allow setting of indicators or MT is not currently reachable, +CME ERROR: <err> is returned.

If certain indicator is not writable, setting of it should be ignored. If parameter is empty field, indicator shall remain in the previous value.

Parameter:

Name	Type	Default	Description
<ind>	integer	1	which shall be in range of corresponding <descr>

Additional info:



Name	Type	Default	Description
<descr>	string	N/A	reserved by the present document and their <ind> ranges.

Values:

- "battchg" : battery charge level (0 5)
- "signal" : signal quality (0 5)
- "service" : service availability (0 1)
- "sounder" : sounder activity (0 1)
- "message" : message received (0 1)
- "call" : call in progress (0 1)
- "vox" : transmit activated by voice activity (0 1)
- "roam" : roaming indicator (0 1)
- "smsfull" : a short message memory storage in the MT has become full and a short message has been rejected (2), has become full (1), or memory locations are available (0); i.e. the range is (0 2)
- "inputstatus" : keypad/touch screen status (0-1)

i MT manufacturer should offer the description of supported indicators not listed here and their value ranges and default values.

i "battchg", "sounder", "call", "vox", "inputstatus" are currently not supported.

**AT+CIND?**

Read command returns the status of MT indicators. If MT is not currently reachable, +CME ERROR: <err> is returned.

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

**AT+CIND=?**

Test command returns pairs, where string value <descr> is a maximum 16 character description of the indicator and compound value is the allowed values for the indicator. If MT is not currently reachable, +CME ERROR: <err> is returned.

+CIND: ("signal",(0-5)),("service",(0-1)),("roam",(0-1)),("messages",(0-1)),("smsfull",(0-1))

3.5.6. AT+CMEC - Mobile Termination Control Mode:



See the current implementation limitation in the parameters description.



3GPP TS 27.007



AT+CMEC=[<keyp>[,<disp>[,<ind>[,<tscrn>]]]]

Set command selects the equipment, which operates MT keypad, writes to MT display and sets MT indicators. If operation mode is not allowed by the MT, +CME ERROR: <err> is returned.

Parameter:

Name	Type	Default	Description
<keyp>	integer		
Values:			
0	:		MT can be operated only through its keypad (execute command of +CKPD cannot be used)
1	:		MT can be operated only from TE (with command +CKPD)
2	:		MT can be operated from both MT keypad and TE
<disp>	integer		
Values:			
0	:		only MT can write to its display (command +CDIS can only be used to read the display)
1	:		only TE can write to MT display (with command +CDIS)
2	:		MT display can be written by both MT and TE
<ind>	integer		
Values:			
0	:		only MT can set the status of its indicators (command +CIND can only be used to read the indicators)
1	:		only TE can set the status of MT indicators (with command +CIND)
2	:		MT indicators can be set by both MT and TE
<tscrn>	integer		
Values:			
0	:		only MT can set the status of its indicators (execute command of +CTSA cannot be used)
1	:		only TE can set the status of MT indicators (with command +CTSA)
2	:		MT indicators can be set by both MT and TE



Restriction: only the following parameters are currently supported:

- <keypd>: '0'
- <disp>: '0'
- <ind>: '0'
- <tscrn>: '0'



AT+CMEC?

+CMEC: <keyp>,<disp>,<ind>,<tscrn>



AT+CMEC=?

Test command returns the modes supported as compound values.

+CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <tscrn>s)

3.5.7. AT+CMEE - Report Mobile Termination Error



3GPP TS 27.007



AT+CMEE=<n>

Set command disables or enables the use of final result code +CME ERROR: <err> as an indication of an error relating to the functionality of the MT.

When enabled, MT related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Parameter:

Name	Type	Default	Description
<n>	integer	0	Defines the use of final result code.

Values:

- 0 : disable +CME ERROR: <err> result code and use ERROR instead
- 1 : enable+CME ERROR: <err> result code and use numeric <err> values
- 2 : enable +CME ERROR: <err> result code and use verbose <err> values



AT+CMEE?

+CMEE: <n>



AT+CMEE=?

Test command returns values supported as a compound value.

+CMEE: (list of supported <n>s)

3.5.8. AT+CMER - Mobile Termination Event Reporting



See the current implementation limitation in the parameters description.



3GPP TS 27.007



AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>[,<tscrn>][,<orientation>]]]]]]]

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes. <mode> controls the processing of unsolicited result codes specified within this command. <bfr>controls the effect on buffered codes when <mode> 1, 2 or 3 is entered. If setting is not supported by the MT, +CME ERROR: <err> is returned.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	<p>Values:</p> <ul style="list-style-type: none"> 0 : buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded 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 after reservation; otherwise forward them directly to the TE 3 : forward unsolicited result codes directly to the TE; TA TE link specific inband technique used to embed result codes and data when TA is in on line data mode
<keyp>	integer	0	<p>Value:</p> <ul style="list-style-type: none"> 0 : No keypad event reporting 1 : keypad event reporting using unsolicited result code +CKEV: <key>,<press>. <key> indicates the key (refer IRA values defined in table 67 in subclause "Keypad control +CKPD") and <press> if the key is pressed or released (1 for pressing and 0 for releasing). Only those key pressings, which are not caused by +CKPD shall be indicated by the TA to the TE. NOTE 1:When this mode is enabled, corresponding result codes of all keys currently pressed are flushed to the TA regardless of <bfr>setting. 2 : keypad event reporting using unsolicited result code +CKEV: <key>,<press>. All key pressings shall be directed from TA to TE. NOTE 2:When this mode is enabled, corresponding result codes of all keys currently pressed are flushed to the TA regardless of <bfr>setting.
<disp>	integer	0	<p>Value:</p>

- 0 : no display event reporting
- 1 : display event reporting using unsolicited result code +CDEV: <elem>,<text>. <elem> indicates the element order number (as specified for +CDIS) and <text> is the new value of text element. Only those display events, which are not caused by +CDIS shall be indicated by the TA to the TE.
Character set used in <text> is as specified by command Select TE Character Set +CSCS
- 2 : display event reporting using unsolicited result code +CDEV: <elem>,<text>. All display events shall be directed from TA to TE. Character set used in <text> is as specified by command Select TE Character Set +CSCS

<ind>	integer	0	Event indicator.
--------------------	---------	---	------------------

Values:

- 0 : no indicator event reporting
- 1 : indicator event reporting using unsolicited result code +CIEV: <ind>,<value>. <ind> (when supported) indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE
- 2 : indicator event reporting using unsolicited result code +CIEV: <ind>,<value> (when supported). All indicator events shall be directed from TA to TE

<bfr>	integer	0	
--------------------	---------	---	--

Values:

- 0 : TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered
- 1 : 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)

<tscrn>	integer	0	Touch screen event.
----------------------	---------	---	---------------------

Values:

- 0 : no touch screen event reporting
- 1 : touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>. The <x>,<y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), and <action>indicates the action performed on the screen (0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE.NOTE 3:When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
- 2 : touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>. All touch screen events shall be directed from the TA to the TE.NOTE 4:When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
- 3 : Verbose mode. Touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>. This is a special mode where intermediate depressed result codes (+CTEV: 1,<x>,<y>) are

generated for each new <x>,<y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 5: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.

- 4 : enhanced touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>,<id>[,<duration>]. The <x>,<y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), the <duration> parameter indicates the duration of the touch (as specified for +CTSA) and, the <id> identifies any simultaneous touch (as specified for +CTSA). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE. The <action> parameter indicates the action performed on the screen, if the <duration> parameter is: 0, it is valid for the <action> parameter to indicate 0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap; a positive, non-zero integer, it is valid for the <action> parameter to indicate 0 for screen released. NOTE 6: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
- 5 : enhanced touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>,<id>[,<duration>]. See description of <tscrn> set to 4 for the valid for the <action> parameter. All touch screen events shall be directed from the TA to the TE. NOTE 7: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
- 6 : Verbose mode. enhanced touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>,<id>[,<duration>]. This is a special mode where intermediate depressed result codes (+CTEV: 1,<x>,<y>,<id>[,<duration>]) are generated for each new <x>,<y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. See description of <tscrn> set to 4 for the valid for the <action> parameter. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 8: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.

<orientation>	integer	0	Parameter to enable display orientation event reporting from the TA to the TE, using unsolicited result code +COEV: <CurrentTopSide>. The <CurrentTopSide> parameter indicates the top of the ME's screen (as specified for +CSO).
----------------------------	---------	---	--

Values:

- 0 : No display orientation event reporting.
- 1 : Only those display orientation events, which are not caused by +CSO shall be indicated.
- 2 : All display orientation events shall be indicated.



Restriction: only the following parameters are currently supported:

- <mode>: '3'
- <keyp>: '0'
- <disp>: '0'
- <ind>: '0' or '1' or '2' When <ind> is set to '1' or '2', the notification +CIEV is used (when supported). Only the notifications 'SERVICE', 'SMS FULL' and 'ROAMING' are supported. 'SMS FULL' is a proprietary notification.
- <bfr>: '0'
- <tscrn>: '0'



AT+CMER?

+CMER:<mode>,<keyp>,<disp>,<ind>,<bfr>,<tscrn>,<orientation>



AT+CMER=?

Test command returns the modes supported as compound values.

+CMER: (list of supported <mode>s),(list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s),(list of supported <tscrn>s),(list of supported <orientation>s)

3.5.9. AT+COPN - Read Operator Names



3GPP TS 27.007



AT+COPN

Execute command returns the list of operator names from the MT. Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.

+COPN:<numeric1>,<alpha1>[<CR><LF>+COPN:<numeric2>,<alpha2> [...]]

The parameters are described in the Additional info section.

Additional info:

- ▶▶ List of the parameters meaning.

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



AT+COPN=?

3.5.10. AT+COPS - PLMN Selection



3GPP TS 27.007



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

Set command forces an attempt to select and register the GSM/UMTS/EPS network operator using the SIM/USIM card installed in the currently selected card slot. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper> (it shall be given in format <format>) to a certain access technology, indicated in <AcT>. If the selected operator is not available, no other operator shall be selected (except <mode>=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall apply to further read commands (+COPS?) also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, MT shall be unregistered until <mode>=0 or 1 is selected). This command should be abortable when registration/deregistration attempt is made.

It is recommended (although optional) that after the operator list TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list by two commas.

The access technology selected parameters, <AcT>, should only be used in terminals capable to register to more than one access technology. Selection of <AcT> does not limit the capability to cell reselections, even though an attempt is made to select an access technology, the phone may still re-select a cell in another access technology.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	
Values:			
0	:	automatic	(<oper> field is ignored)
1	:	manual	(<oper> field shall be present, and <AcT> optionally)
2	:	deregister from network	
3	:	set only <format>	(for read command +COPS?), do not attempt registration/deregistration (<oper> and <AcT> fields are ignored); this value is not applicable in read command response
4	:	manual/automatic	(<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered
<format>	integer	0	
Values:			
0	:	long format alphanumeric	<oper>
1	:	short format alphanumeric	<oper>
2	:	numeric	<oper>
<oper>	string	-	<format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 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 Recommendation E.212 [10] Annex A, 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 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).

<stat>	integer	N/A	
Values:			
0	:	unknown	
1	:	available	
2	:	current	
3	:	forbidden	
<AcT>	integer	N/A	The parameter sets/shows the access technology selected.
Values:			
0	:	GSM	
1	:	GSM Compact	
2	:	UTRAN	
3	:	GSM w/EGPRS (see NOTE 1)	
4	:	UTRAN w/HSDPA (see NOTE 2)	
5	:	UTRAN w/HSUPA (see NOTE 2)	
6	:	UTRAN w/HSDPA and HSUPA (see NOTE 2)	
7	:	E-UTRAN	
8	:	EC-GSM-IoT (A/Gb mode) (see NOTE 3)	
9	:	E-UTRAN (NB-S1 mode) (see NOTE 4)	

i NOTE 1: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

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

NOTE 3: 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT.

NOTE 4: 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN (NB-S1 mode).



AT+COPS?

Read command returns the current mode, the currently selected operator and the current Access Technology. If no operator is selected, <format>, <oper> and <AcT> are omitted.

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



AT+COPS=?

Test command returns a set of five parameters, each representing an operator present in the network. A set consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, numeric format representation of the operator and access technology. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks.

+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)]

3.5.11. AT+CPAS - Phone Activity Status



3GPP TS 27.007



AT+CPAS

Execution command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone.

+CPAS: <pas>

Additional info:

- ▶▶ Message format returned by the execution command:

+CPAS: <pas>

Name	Type	Default	Description
<pas>	integer	0	

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..128 : Reserved



Only values 0, 4 and 5 are supported. All other values are reserved.



The 0, 4 and 5 values are currently implemented. All other values are reserved.



AT+CPAS=?

Test command returns values supported by the MT as a compound value.

+CPAS: list of supported <pas>s

3.5.12. AT+CPLS - Selection of Preferred PLMN List

This command is used to 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.



3GPP TS 27.007



AT+CPLS<list>

Execute command selects a list in the SIM/USIM.

Parameter:

Name	Type	Default	Description
<list>	integer	0	

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



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.

+CPLS: (list of supported <list>s)

3.5.13. AT+CSQ - Signal Quality



3GPP TS 27.007



AT+CSQ

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

Additional info:

►► +CSQ: <rssi>,<ber>

Name	Type	Default	Description
<rssi>	integer	N/A	Received signal strength indication.
Values:			
0	:	-113 dBm or less	
1	:	-111 dBm	
2..30	:	-109...-53 dBm	
31	:	- 51 dBm or greater	
99	:	not known or not detectable	
<ber>	integer	N/A	Channel bit error rate (in percent).
Values:			
0..7	:	as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4	
99	:	not known or not detectable	



AT+CSQ=?

Test command returns values supported as compound values.

+CSQ: (list of supported <rssi>s),(list of supported <ber>s)

3.5.14. AT+CTZR - Time Zone Reporting



3GPP TS 27.007



AT+CTZR=<reporting>

This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>, or +CTZE: <tz>,<dst>,[<time>] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. If setting fails in an MT error, +CME ERROR: <err> is returned.

Parameter:

Name	Type	Default	Description
<reporting>	integer	0	

Values:

- 0 : Disable time zone change event reporting
- 1 : Enable time zone change event reporting by unsolicited result code +CTZV: <tz>.
- 2 : Enable extended time zone reporting by unsolicited result code +CTZE: <tz>,<dst>,[<time>].

Unsolicited fields:

Name	Type	Description
<tz>	string	representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "+zz", expressed as a fixed width, two digit integer with the range -48 ... +56. To maintain a fixed width, numbers in the range -9 ... +9 are expressed with a leading zero, e.g. "-09", "+00" and "+09".
<dst>	integer	indicating whether <tz> includes daylight savings adjustment. Values: 0 : <tz> includes no adjustment for Daylight Saving Time 1 : includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time 2 : <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time
<time>	string	representing the local time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). This parameter can be provided by the network at the time of delivering time zone information and will be present in the extended time zone reporting unsolicited result code if provided by the network.



The Time Zone reporting is not affected by the Automatic Time Zone setting command, +CTZU.

**AT+CTZR?**

Read command returns the current reporting settings in the MT.

+CTZR: <reporting>

**AT+CTZR=?**

Test command returns supported <reporting> values.

+CTZR: (list of supported <reporting>s)

3.5.15. AT+CTZU - Automatic Time Zone Update



3GPP TS 27.007



AT+CTZU=<onoff>

Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned.

Parameter:

Name	Type	Default	Description
<onoff>	integer	0	Indicator.

Values:

- 0 : Disable automatic time zone update via NITZ.
- 1 : Enable automatic time zone update via NITZ.



AT+CTZU?

Read command returns the current settings in the MT.

+CTZU: <onoff>



AT+CTZU=?

Test command returns supported on- and off-values.

+CTZU: (list of supported <onoff>s)

3.5.16. AT+SQNHPLMN - Read the Home PLMN

This command reads the HPLMN.



AT+SQNHPLMN?

+SQNHPLMN:<num_oper>,<short_oper>, <long_oper>,

Parameter:

Name	Type	Default	Description
<num_oper>	integer		<p>the GSM Location Area Identification number (refer to 3GPP TS 24.008 [8] subclause 10.5.1.3). Country code with three BCD digits coded as in ITU-T Recommendation E.212 [10] Annex A, plus a two BCD digit network code, which is administration specific.</p> <p>The returned <num_oper> value is not in BCD format, but in IRA characters converted from BCD, so the number has the following format: (country digit3)(country digit2)(country digit1)(network digit3)(network digit2)(network digit1)</p>
<short_oper>	string		Short alphanumeric format of the operator name: up to 8 characters (refer to GSM MoU SE.13 [9]).
<long_oper>	string		Long alphanumeric format of the operator name, up to 16 characters.



AT+SQNHPLMN?

+SQNHPLMN: "00101", "TEST", "Aeroflex"

OK

3.5.17. AT+WS46 - PCCA STD 101 [17] Select Wireless Network



3GPP TS 27.007



AT+WS46<n>

Set command selects the WDS side stack <n>to be used by the TA.

Parameter:

Name	Type	Default	Description
<n>	integer		Refer PCCA STD 101 [17] for other values.

Values:

- 12 : 3GPP System
- 22 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
- 25 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
- 28 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
- 29 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
- 30 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
- 31 : Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.



AT+WS46?

Read command shows current setting

<n>

Additional info:



Name	Type	Default	Description
<n>	integer		The values in <n> for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned.

Values:

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

29 : GERAN and UTRAN
30 : GERAN and E-UTRAN
31 : UTRAN and E-UTRAN

**AT+WS46=?**

Test command displays side stacks implemented in the TA.

[list of supported <n>s

3.6. Packet Domain Commands

3.6.1. AT+CEMODE - UE Modes of Operation for EPS



See the current implementation limitation in mode parameter description.



3GPP TS 27.007



AT+CEMODE=[<mode>]

The set command is used to set the MT to operate according to the specified mode of operation for EPS, see 3GPP TS 24.301 [83]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned.

Extended error responses are enabled by the +CMEE command.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Indicates the 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



Only <mode> 0 and 2 are currently implemented.



AT+CEMODE?

The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology.

+CEMODE: <mode>



AT+CEMODE=?

The test command is used for requesting information on the supported MT mode of operation.

+CEMODE: (list of supported <mode>s)

3.6.2. AT+CGACT - PDP Context Activate or Deactivate



3GPP TS 27.007



AT+CGACT=[<state>[,<cid>[,<cid>][,...]]]

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.250 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned.

Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts.

If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

For EPS, if an attempt is made to disconnect the last PDN connection, then the MT responds with ERROR or, if extended error responses are enabled, a +CME ERROR.

For EPS, the activation request for an EPS bearer resource will be answered by the network by either an EPS dedicated bearer activation or EPS bearer modification request. The request must be accepted by the MT before the PDP context can be set in to established state.

If no <cid>s are specified the activation form of the command activates all defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

Parameters:

Name	Type	Default	Description
<state>	integer	N/A	Indicates the state of PDP context activation.
Values:			
0	:	deactivate	
1	:	activate	
<cid>	integer	-	specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

- If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.
- This command has the characteristics of both the V.250 action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.



AT+CGACT?

The read command returns the current activation states for all the defined PDP contexts.

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



AT+CGACT=?

The test command is used for requesting information on the supported PDP context activation states.

+CGACT: (list of supported <state>s)

3.6.3. AT+CGATT - PS Attach or Detach



3GPP TS 27.007



AT+CGATT=<state>

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

Parameter:

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

Values:

- 0 : detached
- 1 : attached



If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.



AT+CGATT=1 will put the UE in automatic attach mode only if AT+CFUN=1 and until the next AT+CFUN=0.



AT+CGATT?

The read command returns the current Packet Domain service state.

+CGATT: <state>



AT+CGATT=?

The test command is used for requesting information on the supported Packet Domain service states.

+CGATT: (list of supported <state>s)

3.6.4. AT+CGAUTH - PDP Context Authentication Parameters



3GPP TS 27.007



AT+CGAUTH=<cid>[,<auth_prot>[,<userid>[,<password>]]]

Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter <cid> used during the PDP context activation and the PDP context modification procedures. Since the <cid> is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, +CGAUTH is effectively as an extension to these commands.

Parameters:

Name	Type	Default	Description
<cid>	integer	N/A	Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
<auth_prot>	integer	0	authentication type
Values:			
	0	:	None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified.
	1	:	PAP
	2	:	CHAP
<username>	string	-	User name for access to the IP network
<password>	string	-	Password for access to the IP network.



AT+CGAUTH?

The read command returns the current settings for each defined context.

[+CGAUTH:

<cid>,<auth_prot>,<userid>,<password>][<CR><LF>+CGAUTH:<cid>,<auth_prot>,<userid>,<password> [...]]



AT+CGAUTH=?

The test command returns values supported as a compound value.

+CGAUTH: (range of supported <cid>s),(list of supported <auth_prot>s),(range of supported <userid>s),(range of supported <password>s)

3.6.5. AT+CGCMOD - PDP Context Modify



3GPP TS 27.007



AT+CGCMOD[=<cid>[,<cid>[...]]]

The execution command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs. After the 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 is effectively changed.

If no <cid>s are specified the activation form of the command modifies all active contexts.

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).



AT+CGCMOD=?

The test command returns a list of <cid>s associated with active contexts.

+CGCMOD: (list of <cid>s with active contexts)

3.6.6. AT+CGCONTRDP - PDP Context Read Dynamic Parameters



3GPP TS 27.007



AT+CGCONTRDP[=<cid>]

The execution command returns the relevant information <bearer_id>, <apn>, <local_addr and subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr>, <IM_CN_Signalling_Flag> and <LIPA_indication> for an active non secondary PDP context with the context identifier <cid>.

If the MT indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple lines of information per <cid> will be returned.

If the MT has dual stack capabilities, at least one pair of lines with information is returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If this MT with dual stack capabilities indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple of such pairs of lines are returned.

If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned.

[+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]]]

[<CR><LF>+CGCONTRDP:<cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]]][...]

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

Additional info:

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

Name	Type	Default	Description
<berreriId>	integer	-	identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.
<apn>	string	-	a logical name that was used to select the GGSN or the external packet data network.
<local_addr, subnet_mask>	string	-	shows the IP address and subnet mask of the MT. 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. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

<gw_addr>	string	-	shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<DNS_prim_addr>	string	-	shows the IP address of the primary DNS server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<DNS_sec_addr>	string	-	shows the IP address of the secondary DNS server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<P_CSCF_prim_addr>	string	-	shows the IP address of the primary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<P_CSCF_sec_addr>	string	-	shows the IP address of the secondary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<IM_CN_Signalling_Flag>	string	-	shows the IP address of the secondary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

Values:

- 0 : PDP context is not for IM CN subsystem-related signalling only
- 1 : PDP context is for IM CN subsystem-related signalling only

<LIPA_indication>	string	-	shows the IP address of the secondary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
-------------------	--------	---	---

Values:

- 0 : indication not received that the PDP context provides connectivity using a LIPA PDN connection
- 1 : indication received that the PDP context provides connectivity using a LIPA PDN connection

If the MT doesn't have all the IP addresses to be included in a line, e.g. in case the UE received four IP addresses of DNS servers and two IP addresses of P-CSCF servers, the parameter value representing an IP address that can not be populated is set to an empty string or an absent string.

AT+CGCONTRDP=?

The test command returns a list of <cid>s associated with active non secondary contexts.

+CGCONTRDP: (list of <cid>s associated with active contexts)

			If the value is null or omitted, then the subscription value will be requested.
<PDP_addr>	string	-	<p>identifies the MT in the address space applicable to the PDP.</p> <p>If the parameter value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested.</p> <p>The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address(es) may be read using the +CGPADDR command.</p> <p>When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGDCONT.</p>
<d_comp>	integer	0	<p>controls PDP data compression (applicable for SNDTCP only) (refer 3GPP TS 44.065 [61])</p> <p>Values:</p> <p>0 : off</p> <p>1 : on (manufacturer preferred compression)</p> <p>2 : V.42bis</p> <p>3 : V.44</p>
<h_comp>	integer	0	<p>controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62])</p> <p>Values:</p> <p>0 : off</p> <p>1 : on (manufacturer preferred compression)</p> <p>2 : RFC 1144 [105] (applicable for SNDTCP only)</p> <p>3 : RFC 2507 [107]</p> <p>4 : RFC 3095 [108] (applicable for PDCP only)</p>
<IPv4AddrAlloc>	integer	0	<p>controls how the MT/TA requests to get the IPv4 address information</p> <p>Values:</p> <p>0 : IPv4 Address Allocation through NAS Signaling</p> <p>1 : IPv4 Address Allocated through DHCP</p>
<request_type>	integer	0	<p>indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8]</p>

(subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services.

Values:

- 0 : PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific)
- 1 : PDP context is for emergency bearer services
- 2 : PDP context is for new PDP context establishment
- 3 : PDP context is for handover from a non-3GPP access network
- 4 : PDP context is for handover of emergency bearer services from a non-3GPP access network

<P-CSCF_discovery>	integer	0	influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.
---------------------------------	---------	---	---

Values:

- 0 : Preference of P-CSCF address discovery not influenced by +CGDCONT
- 1 : Preference of P-CSCF address discovery through NAS Signalling
- 2 : Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind>	integer	0	indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.
--	---------	---	---

Values:

- 0 : UE indicates that the PDP context is not for IM CN subsystem-related signalling only
- 1 : UE indicates that the PDP context is for IM CN subsystem-related signalling only

<NSLPI>	integer	0	indicates the NAS signalling priority requested for this PDP context
----------------------	---------	---	--

Values:

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

<securePCO>	integer	0	Integer type. Specifies if security protected transmission of PCO is
--------------------------	---------	---	--

			requested or not (applicable for EPS only, see 3GPP TS 23.401 [82] subclause 6.5.1.2).
	Values:		
	0	:	Security protected transmission of PCO is not requested
	1	:	Security protected transmission of PCO is requested
<IPv4_MTU_discovery>	integer	0	influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3.
	Values:		
	0	:	Preference of IPv4 MTU size discovery not influenced by +CGDCONT
	1	:	Preference of IPv4 MTU size discovery through NAS signalling
<Local_Addr_Ind>	integer	0	indicates to the network whether or not the MS supports local IP address in TFTs (see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3).
	Values:		
	0	:	indicates that the MS does not support local IP address in TFTs
	1	:	indicates that the MS supports local IP address in TFTs
<Non-IP_MTU_discovery>	integer	0	influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3.
	Values:		
	0	:	Preference of Non-IP MTU size discovery not influenced by +CGDCONT
	1	:	Preference of Non-IP MTU size discovery through NAS signalling
<Reliable_Data_Service>	integer	0	indicates whether the UE is using Reliable Data Service for a PDN connection or not, see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3.
	Values:		
	0	:	Reliable Data Service is not being used for the PDN connection
	1	:	Reliable Data Service is being used for the PDN connection

i NOTE1 : The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.

NOTE2 : Only IP, IPV6 and IPV4V6 values are supported for EPS services.

NOTE3 : For EPS <PDP_addr>, this field or the parameter value of the field is omitted.

NOTE4 : If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9.

NOTE5 : A PDP context established for handover of emergency bearer services from a non-3GPP access network has the same status as a PDP context for emergency bearer services.

NOTE6 : The MT utilises the provide NSLPI information as specified in 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8].

AT+CGDCONT?

The read command returns the current settings for each defined context.

```
[+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>]]]]]]]]][<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>]]]]]]]]][...]]
```

AT+CGDCONT=?

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

```
+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <Non-IP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s)[<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported <Local_Addr_Ind>s),(list of supported <Non-IP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s)[...]]
```

3.6.8. AT+CGDSCONT - Define Secondary PDP Context



[1] 3GPP TS 27.007



AT+CGDSCONT=[<cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind>]]]

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>.

The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

In EPS the command is used to define traffic flows.

A special form of the set command, +CGDSCONT=<cid> causes the values for context number <cid> to become undefined.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.
<p_cid>	integer	-	specifies a particular PDP context definition which has been specified by use of the +CGDSCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.
<d_comp>	integer	0	controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [61])

Values:

- 0 : off
- 1 : on (manufacturer preferred compression)
- 2 : V.42 bis
- 3 : V.44

<h_comp>	integer	0	controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62])
----------	---------	---	---

Values:

- 0 : off
- 1 : on (manufacturer preferred compression)
- 2 : RFC 1144 [105] (applicable for SNDCP only)
- 3 : RFC 2507 [107]
- 4 : RFC 3095 [108] (applicable for PDCP only)

<IM_CN_Signalling_Flag_Ind>	integer	N/A	indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.
--	---------	-----	---

Values:

- 0 : UE indicates that the PDP context is not for IM CN subsystem-related signalling only
 - 1 : UE indicates that the PDP context is for IM CN subsystem-related signalling only
-



NOTE1 : If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

NOTE2 : The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDSCONT and +CGDSCONT.



AT+CGDSCONT?

The read command returns the current settings for each defined context.

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



AT+CGDSCONT=?

The test command returns values supported as a compound value.

+CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IM_CN_Signalling_Flag_Ind>s)

3.6.9. AT+CGEQOS - Define EPS Quality of Service



[1] 3GPP TS 27.007



AT+CGEQOS=[<cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>]]]

The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] for a PDP context or Traffic Flows (see 3GPP TS 24.301 [83] and 3GPP TS 23.203 [85]). When in UMTS/GPRS the MT applies a mapping function to UMTS/GPRS Quality of Service.

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	-	specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).
<QCI>	integer	9	specifies a class of EPS QoS (see 3GPP TS 24.301 [83]).
Values:			
0	:	QCI is selected by network	
1 to 4	:	value range for guaranteed bit rate Traffic Flows	
5 to 9	:	value range for non-guaranteed bit rate Traffic Flows	
128 to 254	:	value range for Operator-specific QCIs	
<DL_GBR>	integer	-	indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_GBR>	integer	-	indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<DL_MBR>	integer	-	indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_MBR>	integer	-	indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).



AT+CGEQOS?

The read command returns the current settings for each defined QoS.

```
[+CGEQOS:<cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>]] [<C
R><LF>+CGEQOS: <cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>] [...]]
```



AT+CGEQOS=?

The test command returns the ranges of the supported parameters.

+CGEQOS: (range 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)

3.6.10. AT+CGEQOSRDP - EPS Quality of Service Read Dynamic Parameters



3GPP TS 27.007




[+CGEQOSRDP:<cid>,<QCI>,<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>],[<DL_AMBR>,<UL_AMBR>]][<CR><LF>+CGEQOSRDP:<cid>,<QCI>,<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>],[<DL_AMBR>,<UL_AMBR>] [...]]

The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] of the active secondary or non secondary PDP context associated to the provided context identifier <cid>.

If the parameter <cid> is omitted, the Quality of Service parameters for all secondary and non secondary active PDP contexts are returned.

Parameters:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).
<QCI>	integer	9	specifies a class of EPS QoS (see 3GPP TS 24.301 [83]).
Values:			
0	:	QCI is selected by network	
1 to 4	:	value range for guaranteed bit rate Traffic Flows	
5 to 9	:	value range for non-guaranteed bit rate Traffic Flows	
128 to 254	:	value range for Operator-specific QCIs	
<DL_GBR>	integer	-	indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_GBR>	integer	-	indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<DL_MBR>	integer	-	indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_MBR>	integer	-	indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<DL_AMBR>	integer	-	indicates DL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.
<UL_AMBR>	integer	-	indicates UL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.

-
-  If multiple lines in a response belong to the same PDN connection they contain the same <DL_AMBR> <UL_AMBR> values.
-

**AT+CGEQOSRDP=?**

The test command returns a list of <cid>s associated with secondary or non secondary active PDP contexts.

Parameters of both network and MT/TA initiated PDP contexts will be returned.

+CGEQOSRDP: (list of <cid>s associated with active contexts)

3.6.11. AT+CGEREP - Packet Domain Event Reporting



3GPP TS 27.007



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

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

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 MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
- 1 : discard unsolicited result codes when MT 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 MT when MT TE link is reserved (e.g. in on line data mode) and flush them to the TE when MT 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 : MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered
- 1 : MT 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:

For network attachment, the following unsolicited result codes and the corresponding events are defined:

- ▶▶ The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: NW DETACH

- ▶▶ The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV: NE DETACH

For MT class, the following unsolicited result codes and the corresponding events are defined:

- ▶▶ The network has forced a change of MT class. The highest available class is reported (see +CGCLASS in 3GPP 27.007 specification). The format of the parameter <class> is found in command +CGCLASS.

+CGEV: NW CLASS <class>

- ▶▶ The mobile termination has forced a change of MT class. The highest available class is reported (see +CGCLASS in 3GPP 27.007 specification). The format of the parameter <class> is found in command +CGCLASS.

+CGEV: ME CLASS <class>

For PDP context activation, the following unsolicited result codes and the corresponding events are defined:


- ▶▶ 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. The format of the parameter <cid> is found in command +CGDCONT.

+CGEV: NW PDN ACT <cid>[,<WLAN_Offload>]

Name	Type	Description
<WLAN_Offload>	integer	An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value) and bit 2 (UTRAN offload acceptability value) in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.

Values:

- 0 : offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable.
- 1 : offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode.
- 2 : offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode.
- 3 : offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable.

 This event is not applicable for EPS.

- ▶▶ The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above.

+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]][,<WLAN_Offload>]

Name	Type	Description
<reason>	integer	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.
<p>Values:</p> <p>0 : IPv4 only allowed</p> <p>1 : IPv6 only allowed</p> <p>2 : single address bearers only allowed.</p> <p>3 : single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.</p>		
<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 MT initiated 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>.

For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid_other> returned to TE.

▶▶ The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <WLAN_Offload> is defined above.

+CGEV: NW ACT <p_cid>, <cid>, <event_type>[,<WLAN_Offload>]

Name	Type	Description
<event_type>	integer	indicates whether this is an informational event or whether the TE has to acknowledge it.
<p>Values:</p> <p>0 : Informational event</p> <p>1 : Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.</p>		

▶▶ The network has responded to an ME initiated context activation. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters

<p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

+CGEV: ME ACT <p_cid>, <cid>, <event_type>[,<WLAN_Offload>]

For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

- ▶▶ The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDSCONT.

+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]

- ▶▶ The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDSCONT.

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<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. The format of the parameter <cid> is found in command +CGDSCONT. The format of the parameter <WLAN_Offload> is defined above.

+CGEV: NW PDN DEACT <cid>[,<WLAN_Offload>]

- i** Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>].

- ▶▶ The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDSCONT.

+CGEV: ME PDN DEACT <cid>

- i** Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<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>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

+CGEV: NW DEACT <p_cid>, <cid>, <event_type>[,<WLAN_Offload>]

- i** Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>].

- ▶▶ The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

+CGEV: ME DEACT <p_cid>, <cid>, <event_type>

- i** Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>].

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

- ▶▶ The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type>, and <WLAN_Offload> are defined above.

+CGEV: NW MODIFY <cid>, <change_reason>, <event_type>[,<WLAN_Offload>]

Name	Type	Description
<change_reason >	integer	a bitmap that indicates what kind of change occurred. The <change_reason> value is determined by summing all the applicable bits. For example if both the values of QoS changed (Bit 2) and WLAN_Offload changed (Bit 3) have changed, then the <change_reason> value is 6.
	Values:	
	Bit 1	: TFT changed
	Bit 2	: Qos changed
	Bit 2	: WLAN Offload changed

- i** The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN_Offload> defined above.


- ▶▶ The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type> and <WLAN_Offload> are defined above.

+CGEV: ME MODIFY <cid>, <change_reason>, <event_type>[,<WLAN_Offload>]

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:


- ▶▶ A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type> and <PDP_addr> are found in command +CGDCONT.

+CGEV: REJECT <PDP_type>, <PDP_addr>

 This event is not applicable for EPS.

▶▶ The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.

+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

 This event is not applicable for EPS.



AT+CGEREP?

Read command returns the current mode and buffer settings

+CGEREP: <mode>,<bfr>



AT+CGEREP=?

Test command returns the modes and buffer settings supported by the MT as compound values.

+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)

3.6.12. AT+CGPADDR - Show PDP Address



3GPP TS 27.007



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

The execution command returns a list of PDP addresses for the specified context identifiers. If no <cid> is specified, the addresses for all defined contexts are returned.

[+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 the +CGDCONT and +CGDSCONT commands).

Additional info:



Name	Type	Default	Description
<PDP_addr_1, PDP_addr_2>	string	-	Each is a string type 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 and +CGDSCONT commands 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. When +CGPIAF is supported, its settings can influence the format of the IPv6 address in parameter <PDP_addr_1> or <PDP_addr_2> returned with the execute form of +CGPADDR.



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=?

The test command returns a list of defined <cid>s.

+CGPADDR: (list of defined <cid>s)

3.6.13. AT+CGPIAF - Printing IP Address Format



3GPP TS 27.007

AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressZeros>]]]]

Set command decides what format to print IPV6 address parameters of other AT commands. See RFC 4291 [88] for details of the IPv6 address format.

The +CGPIAF parameters <IPv6_AddressFormat>, <IPv6_SubnetNotation>, <IPv6_LeadingZeros> and <IPv6_CompressedZeros> affect the following commands and parameters:

1. in +CGTFT and +CGTFTRDP, the <remote address and subnet mask>;
2. in +CGDCONT, the <PDP_addr>;
3. in +CGPADDR, the <PDP_addr_1> and <PDP_addr_2>;
4. in +CGCONTRDP, the <local address and subnet mask>, <DNS_prim_addr>, <DNS_sec_addr>, <P_CSCF_prim_addr> and <P_CSCF_sec_addr>; and
5. in +CRC, the <PDP_addr> of unsolicited result code GPRS <PDP_type>, <PDP_addr>[, <L2P>][,<APN>].

Parameters:

Name	Type	Default	Description
<IPv6_AddressFormat>	integer	0	decides the IPv6 address format. Relevant for all AT command parameters that can hold an IPv6 address.

Values:

- 0 : Use IPv4-like dot-notation. IP address, and subnetwork mask if applicable, are dot-separated.
Example:For <remote address and subnet mask>:"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.0.0.0.255.255.255.255.255.255.240.0.0.0.0.0.0.0"
- For other IP address parameters:"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0"
- 1 : Use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.Example:For <remote address and subnet mask>:"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000"For other IP address parameters:"2001:0DB8:0000:CD30:0000:0000:0000:0000"

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

Values:

- 0 : Both IP Address and subnet mask are stated explicitly, separated by a space.
Example:"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000"
- 1 : The printout format is applying / (forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation.
Example:"2001:0DB8:0000:CD30:0000:0000:0000:0000/60"

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

Values:

- 0 : Leading zeros are omitted.Example:
"2001:DB8:0:CD30:0:0:0:0"
- 1 : Leading zeros are included.Example:"2001:0DB8:0000:CD30:0000:0000:0000:0000"

<Pv6_CompressZeros>	integer	0	decides whether 1-n instances of 16-bit zero-values are replaced by only '::'. This applies only once. Setting does not apply if <IPv6_AddressFormat> = 0.
----------------------------------	---------	---	--

Values:

- 0 : No zero compression.Example:"2001:DB8:0:CD30:0:0:0:0"
 - 1 : Use zero compression.Example:"2001:DB8:0:CD30::"
-

AT+CGPIAF?

Read command returns the current command parameter settings.

+CGPIAF:<IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>

AT+CGPIAF=?

Test command returns values supported as compound values.

+CGPIAF:(list of supported <IPv6_AddressFormat>s), (list of supported <IPv6_SubnetNotation>s), (list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressZeros>s)

3.6.14. AT+CGSCONTRDP - Secondary PDP Context Read Dynamic Parameters



3GPP TS 27.007



AT+CGSCONTRDP[=<cid>]

The execution command returns <p_cid>, <bearer_id> and <IM_CN_Signalling_Flag> for an active secondary PDP context with the context identifier <cid>.

If the parameter <cid> is omitted, the <cid>, <p_cid>, <bearer_id> and <IM_CN_Signalling_Flag> are returned for all active secondary PDP contexts.

In EPS, the Traffic Flow parameters are returned.

[+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>]]<CR><LF>+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>][...]

Parameter:

Name	Type	Default	Description
<cid>	integer	-	specifies a particular active secondary PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

Additional info:



Name	Type	Default	Description
<p_cid>	integer	-	specifies a particular PDP context definition or default EPS context Identifier which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface (see the +CGDSCONT command).
<bearer_id>	integer	-	identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.
<IM_CN_Signalling_Flag>	integer	-	shows whether the PDP context is for IM CN subsystem-related signalling only or not.

Values:

- 0 : PDP context is not for IM CN subsystem-related signalling only
- 1 : PDP context is for IM CN subsystem-related signalling only



AT+CGSCONTRDP=?

The test command returns a list of <cid>s associated with active secondary PDP contexts.

+CGSCONTRDP: (list of <cid>s associated with active contexts)

Parameters for UE initiated and network initiated PDP contexts are returned.

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

See the current implementation limitation in service parameter description.

3GPP TS 27.007

AT+CGSMS=[<service>]
 The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

Parameter:

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

Values:

- 0 : Packet Domain
- 1 : circuit switched
- 2 : Packet Domain preferred (use circuit switched if GPRS not available)
- 3 : circuit switched preferred (use Packet Domain if circuit switched not available)

only <service> 0 and 2 are currently implemented.

AT+CGSMS?
 The read command returns the currently selected service or service preference.

+CGSMS: <service>

AT+CGSMS=?
 The test command is used for requesting information on the currently available services and service preferences.

+CGSMS: (list of supported <service>s)

<remote port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec security parameter index (spi)>	integer	-	The value is in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask, traffic class (ipv6) and mask>	string	-	The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	integer	-	The numeric value is in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<service>	integer	1	indicates the service or service preference to be used

Values:

- 0 : Pre-Release 7 TFT filter (see 3GPP TS 24.008 [8], table 10.5.162)
- 1 : Uplink
- 2 : Downlink
- 3 : Birectional (Up & Downlink)

Additional info:

- ▶▶ Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].



AT+CGTFT?

The read command returns the current settings for all Packet Filters for each defined context.

[+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>][<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction> [...]]



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 are 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 used.

+CGTFT:<PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote 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),(list of supported

<direction>s)[<CR><LF>+CGTFT:<PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote 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),(list of supported <direction>s) [...]]

3.6.17. AT+CGTFTRDP - Traffic Flow Template Read Dynamic Parameters



3GPP TS 27.007; 3GPP TS 03.60/23.060



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 will be returned.

Possible Response(s):

[+CGTFTRDP: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote 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>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote 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 secondary or non secondary PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).

Additional info:

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

Name	Type	Default	Description
<packet filter identifier>	integer	N/A	The value range is from 1 to 16.
<evaluation precedence index>	integer	N/A	The value range is from 0 to 255.
<remote address, subnet mask>	string	-	The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGTFTRDP.
<protocol number (ipv4) / next>	integer	N/A	The value range is from 0 to 255.

header (ipv6)>			
<local port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<remote port range>	string	-	The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec security parameter index (spi)>	integer	-	The value is in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	string	-	The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	integer	-	The value is in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<direction >	integer	N/A	specifies the transmission direction in which the Packet Filter shall be applied
	Values:		
	0	:	Pre Release 7 TFT Filter (see 3GPP TS 24.008, table 10.5.162)
	1	:	Uplink
	2	:	Downlink
	3	:	Bidirectional (Used for Uplink and Downlink)
<NW packet filter Identifier>	integer	N/A	The value range is from 1 to 16. In EPS the value is assigned by the network when established

Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations are shown in 3GPP TS 23.060 [47].

AT+CGTFTRDP=?

The test command returns a list of <cid>s associated with active secondary and non secondary contexts.

+CGTFTRDP: (list of <cid>s associated with active contexts)

3.7. Phonebook Commands

3.7.1. AT+CNUM - Subscriber Number



3GPP TS 27.007



AT+CNUM

Action command returns the MSISDNs related to the subscriber (this information can be stored in the SIM/UICC or in the MT). When storing information in the SIM/UICC, if the currently selected card slot contains a SIM card or a UICC with an active GSM application, the information is stored in the EFMSISDN under DFTelecom. If the currently selected card slot contains a UICC with an active USIM application, the information is stored in the EFMSISDN under ADFUSIM). If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line.

+CNUM: [<alpha1>,<number1>,<type1>,<speed>,<service>,<itc>][<CR><LF>+CNUM: [<alpha2>,<number2>,<type2>,<speed>,<service>,<itc>]][...]

Additional info:

- ▶▶ List of the parameters meaning.

Name	Type	Default	Description
<alphax>	string	-	Associated with <numberx>; used character set should be the one selected with command 8.18 Select TE Character Set: +CSCS on page 220.
<numberx>	string	-	Phone number of format specified by <typex>.
<typex>	integer	N/A	Type of address octet (refer 3GPP TS 24.008 [8] subclause 10.5.4.7)
<speed>	-	-	As defined in subclause 6.7
<service>	integer	N/A	Service related to the phone number.

Values:

- 0 : asynchronous modem
- 1 : synchronous modem
- 2 : PAD Access (asynchronous)
- 3 : Packet Access (synchronous)
- 4 : Voice
- 5 : Fax

All other values below 128 are reserved

<itc>	integer	N/A	Information transfer capability.
-------	---------	-----	----------------------------------

Values:

- 0 : 3,1 kHz
- 1 : UDI



AT+CNUM=?

3.8. SMS Commands

3.8.1. AT+CMGC - Send Command



3GPP TS 27.005



if text mode (+CMGF=1):

+CMGC=<fo>,<ct>[,<pid>[,<mn>[,<da>[,<toda>]]]]<CR>text isentered<ctrl-Z/ESC>

Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of text (3GPP TS 23.040 [3] TP-Command-Data) is done similarly as specified in command Send Message +CMGS, but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets (refer +CMGS).

Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

▶▶if text mode (+CMGF=1) and sending successful:

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



AT+CMGC=?

3.8.2. AT+CMGD - Delete Message



See the current implementation limitation in delflag parameter description.



3GPP TS 27.005



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

Execution command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, final result code +CMS ERROR: <err> is returned.

Parameters:

Name	Type	Default	Description
<index>	integer	-	
<delflag>	integer	0	Indicates multiple message deletion request as follows:

Values:

- 0 (or omitted) : Default value if not specified. Delete the message specified in <index>.
- 1 : Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
- 2 : Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched
- 3 : Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.
- 4 : Delete all messages from preferred message storage including unread messages.



Only the <delflag> 0 and 4 are currently implemented.



AT+CMGD=?

Test command shows the valid memory locations and optionally the supported values of <delflag>.

+CMGD:(list of supported <index>s)[,(list of supported <delflag>s)]

3.8.3. AT+CMGF - Message Format.



3GPP TS 27.005



AT+CMGF=[<mode>]

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages.

Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface

Parameter:

Name	Type	Default	Description
<mode>	integer	0	Indicates multiple message deletion request as follows:

Values:

- 0 : PDU mode (default when implemented)
- 1 : text mode



AT+CMGF?

+CMGF: <mode>



AT+CMGF=?

Test command returns supported modes as a compound value.

+CMGF:(list of supported <index>s)[,(list of supported <mode>s)]

3.8.4. AT+CMGL - List Messages



3GPP TS 27.005

AT+CMGL=<stat>

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

Parameter:

Name	Type	Default	Description
<stat>	integer	N/A	

Values:

- 0 : "REC UNREAD": received unread message (i.e. new message)
- 1 : "REC READ": received read message
- 2 : "STO UNSENT": stored unsent message (only applicable to SMS)
- 3 : "STO SENT": stored sent message (only applicable to SMS)
- 4 : "ALL": all messages (only applicable to +CMGL command)

▶▶ if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:

```
+CMGL:<index>,<stat>,<oa/da>,<[alpha]>,<[scts]>,<[tooa/toda>,<length><CR><LF><data><CR><LF>
+CMGL:<index>,<stat>,<da/oa>,<[alpha]>,<[scts]>,<[tooa/toda>,<length><CR><LF><data>[...]]
```

▶▶ if text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs:


```
+CMGL:<index>,<stat>,<fo>,<mr>,<[ra>,<[tora>,<scts>,<dt>,<st><CR><LF>+CMGL:<index>,<stat>,<fo>,<mr>,<[ra>,<[tora>,<scts>,<dt>,<st>[...]]
```

▶▶ if text mode (+CMGF=1), command successful and SMS-COMMANDs:

```
+CMGL:<index>,<stat>,<fo>,<ct><CR><LF>+CMGL:<index>,<stat>,<fo>,<ct>[...]]
```

▶▶ if text mode (+CMGF=1), command successful and CBM storage:

```
+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data><CR><LF>+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]]
```

-
-  If the selected <mem1> can contain different types of SMS (e.g. SMS-DELIVERs, SMS-SUBMITs, SMS-STATUS-REPORTs and SMS-COMMANDs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.
-

AT+CMGL=?

Test command shall give a list of all status values supported by the TA.

+CMGL:(list of supported <stat>s)

3.8.5. AT+CMGR - Read Message



3GPP TS 27.005



AT+CMGR=<index>

Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned.

▶▶ if text mode (+CMGF=1), command successful and SMS-DELIVER:

+CMGR:

```
<stat>,<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data>
```

▶▶ if text mode (+CMGF=1), command successful and SMS-SUBMIT:

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

▶▶ if text mode (+CMGF=1), command successful and SMS-STATUS-REPORT:

```
+CMGR:<stat>,<fo>,<mr>,<ra>[,<tora>],<scts>,<dt>,<st>
```

▶▶ if text mode (+CMGF=1), command successful and SMS-COMMAND:

```
+CMGR:<stat>,<fo>,<ct>[,<pid>,<mn>],<da>[,<toda>],<length><CR><LF><data>
```

▶▶ if text mode (+CMGF=1), command successful and CBM storage:

```
+CMGR:<stat>,<sn>,<mid>,<dcsc>,<page>,<pages><CR><LF><data>
```



AT+CMGR=?

3.8.6. AT+CMGS - Send Short Message



3GPP TS 27.005



if text mode (+CMGF=1):

AT+CMGS=<da>[,<toda>]<CR>text is entered<ctrl-Z/ESC>

Execution command sends message from a TE to the network (SMS-SUBMIT).

Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

- entered text (3GPP TS 23.040 [3] TP-Data-Unit) is sent to address <da> and all current settings (refer Set Text Mode Parameters +CSMP and Service Centre Address +CSCA) are used to construct the actual PDU in ME/TA.
- the TA shall send a four character sequence <CR><LF><greater_than><space> (IRA 13, 10, 62, 32) after command line is terminated with <CR>; after that text can be entered from TE to ME/TA.
- the DCD signal shall be in ON state while text is entered.
- the echoing of entered characters back from the TA is controlled by V.25ter echo command E.
- the entered text should be formatted as follows:
 - if <dc> (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7 bit default alphabet is used and <fo> indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set:
 - if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules of Annex A; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user);
 - if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character (GSM 7 bit default alphabet 23)).
- if <dc> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that 3GPP TS 23.040 [3] 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. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42).
- sending can be cancelled by giving <ESC> character (IRA 27).
- <ctrl-Z> (IRA 26) must be used to indicate the ending of the message body.

►►if text mode (+CMGF=1) and sending successful:

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



AT+CMGS=?

3.8.7. AT+CMGW - Write Message to Memory



3GPP TS 27.005



If text mode (+CMGF=1)

AT+CMGW=[<oa/da>[,<toa/toda>[,<stat>]]]<CR>text is entered<ctrl-Z/ESC>

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. The entering of text is done similarly as specified in command Send Message: +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned.



SMS-COMMANDs and SMS-STATUS-REPORTs can not be stored in text mode.

Parameter:

Name	Type	Default	Description
<mode>	integer	N/A	Indicates multiple message deletion request as follows:

Values:

- 0 : PDU mode (default when implemented)
- 1 : text mode

▶▶ +CMGW:<index>



AT+CMGW=?

3.8.8. AT+CMMS - More Message to Send



3GPP TS 27.005



AT+CMMS=<n>

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. The entering of text is done similarly as specified in command Send Message: +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned.

Parameter:

Name	Type	Default	Description
<n>	integer	N/A	

Values:

- 0 : Disable
- 1 : keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0
- 2 : enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <n>=0)



AT+CMMS?

+CMMS:<n>



AT+CMMS=?

Test command returns supported values as a compound value.

+CMMS:(list of supported <n>s)

3.8.9. AT+CMSS - Send Message from Storage



3GPP TS 27.005



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

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned.

Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

▶▶ if text mode (+CMGF=1) and sending successful:

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



AT+CMSS=?

3.8.10. AT+CNMA - New Message Acknowledgement to ME/TA



See the current implementation limitation in command description.



3GPP TS 27.005



if PDU mode (+CMGF=0):

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

- PDU Mode

Execution command confirms reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI tables 2 and 4). This acknowledgement command shall be used when +CSMS parameter <service> equals 1. In PDU mode, it is possible to send either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network. Parameter <n> defines which one will be sent. Optionally (when <length> is greater than zero) an acknowledgement TPDU (SMS-DELIVER-REPORT for RP-ACK or RP-ERROR) may be sent to the network. The entering of PDU is done similarly as specified in command Send Message +CMGS, except that the format of <ackpdu> is used instead of <pdu> (i.e. SMSC address field is not present). PDU shall not be bounded by double quotes. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should respond as specified in 3GPP TS 24.011 [6] to the network. ME/TA shall automatically disable routing to TE by setting both <mt> and <ds> values of +CNMI to zero.



Only parameter <n> is currently supported in PDU mode.

- Text Mode

Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI table 3.4.1-3 and table 3.4.1-5). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should respond as specified in 3GPP TS 24.011 [6] to the network. ME/TA shall automatically disable routing to TE by setting both <mt> and <ds> values of +CNMI to zero.



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

Later, when buffered result codes are flushed to TE, TE must send +CNMA acknowledgement for each result code. In this way, ME/TA can determine if message should be placed in non-volatile memory and routing to TE disabled (+CNMA not received). Refer command +CNMI for more details how to use <mode> parameter reliably.

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



if Text mode (+CMGF=1):
AT+CNMA



AT+CMGW=?

if PDU mode (+CMGF=0):
+CNMA:(list of supported <n>s)
if Text mode (+CMGF=1):
OK

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



3GPP TS 27.005



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

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP TS 23.038 [2].

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned.

Parameters:

Name	Type	Default	Description
<mode>	integer	0	The buffering mechanism may as well be located in the ME; the setting affects only to unsolicited result codes specified within this command):

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 (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 after reservation. Otherwise forward them directly to the TE.
- 3 : Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.

<mt>	integer	0	The rules for storing received SMS depend on its data coding scheme (refer 3GPP TS 23.038 [2]), preferred memory storage (+CPMS) setting and this value;
------	---------	---	--

Values:

- 0 : No SMS-DELIVER indications are routed to the TE.
- 1 : If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:
+CMTI: <mem>,<index>
- 2 : SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code:
+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled);

or+CMT: <oa>, [<alpha>],<scts>[,<toa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled; about parameters in italics, refer command Show Text Mode Parameters +CSDH) If ME has its own display device then class 0 messages and messages in the message waiting indication group (discard message) may be copied to both ME display and to TE. In this case, ME shall send the acknowledgement to the network (refer table 2).

Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1.

- 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	The rules for storing received CBMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), the setting of Select CBM Types (+CSCB) and this value;
-------------------	---------	---	--

Values:

- 0 : No CBM indications are routed to the TE.
- 1 : If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>,<index>
- 2 : New CBMs are routed directly to the TE using unsolicited result code:
+CBM: <length><CR><LF><pdu> (PDU mode enabled)or+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled) If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).
- 3 : CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.

<ds>	integer	0
-------------------	---------	---

Values:

- 0 : No SMS-STATUS-REPORTs are routed to the TE.
- 1 : SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:
+CDS: <length><CR><LF><pdu> (PDU mode enabled) or
+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (text mode enabled)
- 2 : If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:+CDSI: <mem>,<index>

<bfr>	Integer	0
--------------------	---------	---

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.
-



Only the following parameters are supported:

- <mode>: '0' or '1' or '2'
- <mt>: '0' or '1' or '2' or '3'
- <bm>: '0' (broadcast is not supported)
- <ds>: '0' or '1' or '2'
- <bfr>: '0' or '1'



The following parameters are NOT supported:

- <mode>: '3'
- <bm>: '1' (broadcast is not supported)



When DTR signal is not available or the state of the signal is ignored (V.25ter command &D0), reliable message transfer can be assured by using +CNMA acknowledgement procedure.



Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMS and CBMs, and to define whether a message routed directly to TE should be acknowledged or not (refer command +CNMA).



It is possible that ME/TA result code buffer is in volatile memory. In this case messages may get lost if the power of ME/TA is switched off before codes are sent to TE. Thus, it is not recommended to use direct message routing (<mt>=2 or 3, <bm>=2 or 3, or <ds>=1) with <mode> value 0 or 2.



If AT command interface is acting as the only display device, the ME must support storing of class 0 messages and messages in the message waiting indication group (discard message):



AT+CNMI?

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



AT+CNMI=?

Test command gives the settings supported by the TA as compound values.

+CNMI:(list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)

3.8.12. AT+CPMS - Preferred Message Storage



3GPP TS 27.005



AT+CPMS=<mem1>[,<mem2>[,<mem3>]]

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned.



+CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,<total3>



AT+CPMS?

+CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>



AT+CPMS=?

Test command returns lists of memory storages supported by the TA.

+CPMS:(list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)

3.8.13. AT+CRES - Restore Settings



See the current implementation limitation in the parameters description.



3GPP TS 27.005



AT+CRES[=<profile>]

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings.

Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored.

Parameter:

Name	Type	Default	Description
<profile>	integer	N/A	Value in range 0...255. Manufacturer specific profile number from where settings are to be restored.



AT+CRES=?

+CRES: (list of supported <profile>s)

3.8.15. AT+CSAS - Save Settings



See the current implementation limitation in the parameters description.



3GPP TS 27.005



AT+CSAS[=<profile>]

Execution command saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved.

Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.

Parameter:

Name	Type	Default	Description
<profile>	integer	N/A	Value in range 0...255. Manufacturer specific profile number where settings are to be stored.



AT+CSAS=?

Test command shall display the supported profile numbers for reading and writing of settings.

+CSAS: (list of supported <profile>s)

3.8.17. AT+CSCA - Service Center Address



3GPP TS 27.005



AT+CSCA=<sca>[, <tosca>]

Set command updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, 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 <pdu> parameter equals zero.



AT+CSCA?

+CSCA:<sca>,<tosca>



AT+CPMS=?

Test command returns lists of memory storages supported by the TA.

+CPMS:(list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)

3.8.17.1. AT+CSCS - Select TE Character Set



3GPP TS 27.007



AT+CSCS=[<chset>]

The "Set" command informs TA which character set <chset> is used by the TE.

TA is then able to convert character strings correctly between TE and MT character sets.

When TA TE interface is set to 8 bit operation and used TE alphabet is 7 bit, the highest bit shall be set to zero.


Parameter:

Name	Type	Default	Description
<chset>	string	IRA	character set as a string type (conversion schemes not listed here can be defined by manufacturers).

Values:

GSM	:	GSM 7 bit default alphabet (3GPP TS 23.038 [25]); this setting causes easily software flow control (XON/XOFF) problems. Note: If MT is using GSM 7 bit default alphabet, its characters shall be padded with 8th bit (zero) before converting them to hexadecimal numbers (i.e. no SMS style packing of 7 bit alphabet).
HEX	:	Character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done.
IRA	:	International reference alphabet (see ITU T Recommendation T.50 [13]).
PCCPxxx	:	PC character set Code Page xxx
PCDN	:	PC Danish/Norwegian character set
UCS2	:	16-bit universal multiple-octet coded character set (see ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99.
UTF-8	:	Octet (8-bit) lossless encoding of UCS characters (see RFC 3629 [69]); UTF-8 encodes each UCS character as a variable number of octets, where the number of octets depends on the integer value assigned to the UCS character. The input format shall be a stream of octets. It shall not be converted to hexadecimal numbers as in "HEX" or "UCS2". This character set requires an 8-bit TA - TE interface.
8859-n	:	ISO 8859 Latin n (1 6) character set
8859-C	:	ISO 8859 Latin/Cyrillic character set
8859-A	:	ISO 8859 Latin/Arabic character set
8859-G	:	ISO 8859 Latin/Greek character set
8859-H	:	ISO 8859 Latin/Hebrew character set

 The “GSM”, “UCS2”, “IRA” and “ITF-8” types are currently implemented.

 It is manufacturer specific how the internal alphabet of MT is converted to/from the TE alphabet.



AT+CSCS?

Read command shows current setting and test command displays conversion schemes implemented in the TA.

+CSCS:<chset>



AT+CSCS=?

+CSCS: (list of supported <chset>s)

3.8.18. AT+CSDH - Show Text Mode Parameters



3GPP TS 27.005



AT+CSDH[=<show>]

Set command controls whether detailed header information is shown in text mode result codes.

Parameter:

Name	Type	Default	Description
<show>	integer	0	

Values:

- 0 : do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <toa> in +CMT, +CMGL, +CMGR result codes for SMSDELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>.
- 1 : show the values in result codes



AT+CSDH?

+CSDH: <show>



AT+CSDH=?

Test command returns supported values as a compound value.

+CSDH: (list of supported <show>s)

3.8.19. AT+CSMP - Set Text Mode Parameters



3GPP TS 27.005



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

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0.. 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. If TA supports the EVPF, see 3GPP TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes.

- i When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>.



AT+CSMP?

+CSMP: <fo>,<vp>,<pid>,<dc>



AT+CSMP=?

3.8.20. AT+CSMS - Select Message Service



See the current implementation limitation in the parameters description.



3GPP TS 27.005



AT+CSMS=<service>

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned.

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

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<service>	integer	0	

Values:

- 0 : 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]
- 1 : 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of <service> setting 1 is mentioned under corresponding command descriptions)
- 2...127 : reserved
- 128 : manufacturer specific

Additional info:

- ▶▶ Parameters meaning of the returned message.

Name	Type	Default	Description
<mt>	integer	0	

Values:

- 0 : type not supported
- 1 : type supported

<mo>	integer	0	
------	---------	---	--

Values:

- 0 : type not supported
- 1 : type supported

<bm>	integer	0	
------	---------	---	--

Values:

0 : type not supported
1 : type supported



Restriction: cannot disable <mt>, <mo> and <bm> services.



AT+CSMS?

Read command returns supported message types along the current service setting.

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



AT+CSMS=?

Test command returns a list of all services supported by the TA.

+CSMS: (list of supported <service>s)

3.9. USAT Related Commands

3.9.1. AT+CUSATE - Send USAT Envelope Command



3GPP TS 27.005



AT+CUSATT=<envelope_command>>

Execution command sends a USAT terminal response to the MT as an answer to a preceding USAT proactive command sent from the UICC with unsolicited result code +CUSATP: <proactive_command> (see +CUSATA command description).

Parameters:

Name	Type	Default	Description
<envelope_command>	string	-	String type in hexadecimal character format. Envelope command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.
<envelope_response>	string	-	String type in hexadecimal character format. Response to the envelope command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object. An empty string is provided if the UICC does not have any response data to provide.
<busy>	integer	N/A	The type of number; For Verizon FW, the range of <type> is 0 - 255.

Values:

- 0 : UICC indicated normal ending of the command.
- 1 : UICC responded with USAT is busy, no retry by the MT.
- 2 : UICC responded with USAT is busy even after one or more retries by the MT.

<sw1>	integer	-	Status word information from the envelope response returned by the UICC as defined in ETSI TS 102 221 [60], subclause 10.2. The parameter can be delivered to the TE both in the case of successful and failed execution of the envelope command.
<sw1>	integer	-	For description, see <sw1>.



AT+CUSATT=?

3.9.2. AT+CUSATR - Read USAT Profile



3GPP TS 27.005



AT+CUSATR[=<profile_storage>]

Execution command +CUSATR=<profile_storage> returns the profile specified by <profile_storage>.

Execution command issued without parameter +CUSATR returns all profiles.

[+CUSATR:<profile_storage>,<profile>][<CR><LF>+CUSATR:<profile_storage>,<profile>[...]]

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<storage>	integer	0	

Values:

- 0 : TE profile that can be set with +CUSATW.
- 1 : MT profile that can be set with +CUSATW.
- 2 : MT default profile that reflects the inherent, default supported facilities of the MT.
- 3 : UICC profile that reflects the currently active UICC profile that was sent to the UICC in the last TERMINAL?PROFILE command.
- 4 : UICC EFUST. The elementary file that indicates services available in the USIM.
- 5 : List of MT only facilities (facilities that are not allowed to be assigned to the TE, see 3GPP TS 31.111 [92]).

Additional info:

- ▶▶ Parameters meaning of the returned message.

Name	Type	Default	Description
<profile>	string	0	string type in hexadecimal character format. The profile describing the supported facilities of the referenced <profile_storage> as specified for the Terminal Profile in 3GPP TS 31.111 [92] or for the related EF in 3GPP TS 31.102 [59].S



AT+CUSATR=?

Test command returns values supported as a compound value.

3.9.3. AT+CUSATT - Send USAT Terminal Response



3GPP TS 27.005



AT+CUSATT=<terminal_response>

Execution command allows the TE to send a USAT envelope command to the MT. If the UICC provides response data to the command or indicates that USAT is busy, the information response +CUSATE: <envelope_response>[,<busy>] is returned. A second line of information response +CUSATE2: <sw1>,<sw2> may be provided if the MT presents the status words provided by the UICC.

+CUSATE:<envelope_response>[,<busy>] [<CR><LF>+CUSATE2: <sw1>,<sw2>]

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<terminal_response>	string	0	String type in hexadecimal character format. Terminal response to a proactive command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.



AT+CUSATT=?

3.9.4. AT+CUSATW - Write USAT Profile



3GPP TS 27.005



AT+CUSATW[=<profile_storage>[,<profile>]]

Execution command +CUSATR=<profile_storage> returns the profile specified by <profile_storage>.

Execution command issued without parameter +CUSATR returns all profiles.

+CUSATW: <profile_storage>,<conflict_profile>

For parameters meaning see Additional info section.

Parameter:

Name	Type	Default	Description
<storage>	integer	0	
Values:			
0	:	TE. Refers profile storage for the facilities supported by the TE. Default value is a blank profile with all bits set to zero. This value is applicable both in the execution command and in the information response.	
1	:	MT. Refers profile storage for the facilities to be supported by MT, which can be a subset of the default MT facilities. The TE can choose to register a subset of the MT default profile, typically omitting facilities also supported by the TE profile. Default value is the MT default profile. This value is applicable both in the execution command and in the information response.	
5	:	Refers to a conflict between the TE profile and the list of MT only facilities. This value is not applicable in the execution command.	
<profile>	string	0	String type in hexadecimal character format. The profile describing the supported USAT facilities of the referenced <profile_storage> as specified for the Terminal Profile in 3GPP TS 31.111 [92].

Additional info:

- ▶▶ Parameters meaning of the returned message.

Name	Type	Default	Description
<conflict_profile>	string	0	String type in hexadecimal character format. A bitwise AND of two profiles, showing the conflicts, that is, USAT facilities supported by both profiles. See description of Terminal Profile in 3GPP TS 31.111 [92].



AT+CUSATR=?

Test command returns values supported as a compound value.

3.9.5. AT+SQNSTKAPNE- Change STK APN Configuration:



3GPP TS 27.005



AT+SQNSTKAPNE=<apnname>, <iptype>,<enabled>

The set command changes the STK APN configuration. If the UICC STK application does not provide the APN in the open channel, this configuration will be used instead.

This setting is not persistent across reboot.

Parameter:

Name	Type	Default	Description
<iptype>	String	0	IP type description.
	ip	: IPv4 only	
	ipv6	: IPv6 only	
	ipv4v6	: IPv4 and IPv6	
<iptype>	String	0	Status.
	Values:		
	0	: APN is disabled	
	1	: APN is enabled	



AT+SQNSTKAPNE?

+SQNSTKAPNE:<apnname>, <iptype>, <enabled>



AT+SQNSTKAPNE=?

+SQNSTKAPNE:<apnname>, (ip, ipv6, ipv4v6), (0,1)



Set STK APN:

```
AT+SQNSTKAPNE="stktest","ipv4v6",1
```

OK

Read the current autoconnect setting:

```
AT+SQNSTKAPNE?
```

```
+SQNSTKAPNE: stktest,ipv4v6,1
```

OK

3.10. USIM Related Commands

3.10.1. AT+CLCK - Facility Lock/Unlock



3GPP TS 27.007



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

Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Call barring facilities are based on GSM/UMTS supplementary services (refer 3GPP TS 22.088 [6]). The interaction of these with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standard.

Parameters:

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

Values:

- "CS" : CNTRL (lock CoNTRoL surface (e.g. phone keyboard))
- "PS" : PH SIM (lock PHOne to SIM/UICC card installed in the currently selected card slot) (MT asks password when other than current SIM/UICC card inserted; MT may remember certain amount of previously used cards thus not requiring password when they are inserted)
- "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)
- "SC" : SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power up and when this lock command issued)
- "AO" : BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 [6] clause 1)
- "OI" : BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 [6] clause 1)
- "OX" : BOIC exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 [6] clause 1)
- "AI" : BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 [6] clause 2)
- "IR" : BIC Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 [6] clause 2)
- "NT" : barr incoming calls from numbers Not stored to TA memory
- "NM" : barr incoming calls from numbers Not stored to MT memory
- "NS" : barr incoming calls from numbers Not stored to SIM/UICC memory
- "NA" : barr incoming calls from numbers Not stored in Any memory
- "AB" : All Barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0)
- "AG" : All outGoing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0)

- "AC" : All inComing barring services (refer 3GPP TS 22.030 [19])
(applicable only for <mode>=0)
- "FD" : SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
- "PN" : Network Personalization (refer 3GPP TS 22.022 [33])
- "PU" : network sUbset Personalization (refer 3GPP TS 22.022 [33])
- "PP" : service Provider Personalization (refer 3GPP TS 22.022 [33])
- "PC" : Corporate Personalization (refer 3GPP TS 22.022 [33])

<mode>	integer	N/A	Mode.
Values:			
	0	:	unlock
	1	:	lock
	2	:	query status
<passwd>	string	-	shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD
<classx>	integer	7	<classx> is a sum of integers each representing a class of information. Default is 7 - voice + data + fax. 1: voice(telephony) 2: data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4: fax (facsimile services) 8: short message service 16: data circuit sync 32: data circuit async 64: dedicated packet access 128: dedicated PAD access
Value:			
	1÷255	:	1..255

Additional info:

- ▶▶ When <mode>=2 and command is successful:
+CLCK: <status>[,<class1>]<CR><LF>+CLCK:<status>,<class2> [...]]

Name	Type	Default	Description
<status>	integer	N/A	Status.
Values:			
	0	:	not active
	1	:	active



The "SC", "FD", "PN" and "PS" facilities are currently implemented.

**AT+CLK=?**

Test command returns facility values supported as a compound value.

+CLK: (list of supported <fac>s)

3.10.2. AT+CPIN - Enter the PIN



3GPP TS 27.007



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

The “Set” command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE.

Parameters:

Name	Type	Default	Description
<pin>	string	-	PIN code.
<newpin>	string	-	new PIN code.



AT+CPIN?

Read command returns an alphanumeric string indicating whether some password is required or not.

+CPIN: <code>

Additional info:

Parameters:

Name	Type	Default	Description
<code>	string	N/A	<code> values reserved by the present document:

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 : MT is waiting phone to SIM card password to be given
- PH-FSIM PIN : MT is waiting phone-to-very first SIM card password to be given
- PH-FSIM PUK : MT is waiting phone-to-very first SIM card unblocking password to be given
- SIM PIN2 : MT is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation)

SIM PUK2	:	MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation)
PH-NET PIN	:	MT is waiting network personalization password to be given
PH-NET PUK	:	MT is waiting network personalization unblocking password to be given
PH-NETSUB PIN	:	MT is waiting network subset personalization password to be given
PH-NETSUB PUK	:	MT is waiting network subset personalization unblocking password to be given
PH-SP PIN	:	MT is waiting service provider personalization password to be given
PH-SP PUK	:	MT is waiting service provider personalization unblocking password to be given
PH-CORP PIN	:	MT is waiting corporate personalization password to be given
PH-CORP PUK	:	MT is waiting corporate personalization unblocking password to be given

i NOTE1 : SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM PUK2 refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required.

This second pin, <newpin>, is used to replace the old pin in the SIM.

NOTE2 : Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH SIM are: +CGMI, +CGMM, +CGMR, +CGSN, D112; (emergency call), +CPAS, +CFUN, +CPIN, +CPINR, +CDIS (read and test command only), and +CIND (read and test command only).

 **AT+CPIN=?**

3.10.3. AT+CPINR - Remaining PIN Retries



3GPP TS 27.007



AT+CPINR=[<sel_code>]

Execution command cause the MT to return the number of remaining PIN retries for the MT passwords with intermediate result code +CPINR: <code>,<retries>[,<default_retries>] for standard PINs. One line with one intermediate result code is returned for every <code> or <ext_code> selected by <sel_code>.

When execution command is issued without the optional parameter <sel_code>, intermediate result codes are returned for all <code>s and <ext_code>s.

In the intermediate result codes, the parameter <default_retries> is an optional (manufacturer specific) parameter, per <code> and <ext_code>.

Parameter:

Name	Type	Default	Description
<sel_code>	string	-	Same values as for the <code> and <ext_code> parameters. These values are strings and shall be indicated within double quotes. It is optional to support wildcard match by '*', meaning match any (sub-)string.

Additional info:

▶▶ Parameters:

Name	Type	Default	Description
<retries>	integer	-	Number of remaining retries per PIN
<default_retries>	integer	-	Number of default/initial retries per PIN
<code>	string	-	Type of PIN. All values listed under the description of the AT+CPIN command, <code> parameter, except 'READY'.
<ext_code>	string	-	Extended, manufacturer specific codes.



Restriction for sel_code parameter: only "SIM PIN" and "SIM PUK" codes are supported. Wildcard matching by "*" is not supported.



AT+CPINR=?



Example: AT+CPINR="SIM*" will return the lines:

```
+CPINR: SIM PIN,<retries>,<default_retries>
+CPINR: SIM PUK,<retries>,<default_retries>
+CPINR: SIM PIN2,<retries>,<default_retries>
+CPINR: SIM PUK2,<retries>,<default_retries>
```

Example: AT+CPINR="*SIM*" will additionally return the lines:

```
+CPINR: PH-SIM PIN,<retries>,<default_retries>
+CPINR: PH-FSIM PIN,<retries>,<default_retries>
+CPINR: PH-FSIM
PUK,<retries>,<default_retries>
```

```
AT+CPINR="SIM*"
+CPINR: SIM PIN,3,3
+CPINR: SIM PUK,10,10
+CPINR: SIM PIN2,0,3
+CPINR: SIM PUK2,2,10
```

OK

```
AT+CPINR="*SIM*"
+CPINR: SIM PIN,3,3
+CPINR: SIM PUK,10,10
+CPINR: SIM PIN2,0,3
+CPINR: SIM PUK2,2,10
+CPINR: PH-FSIM PIN,10,10
+CPINR: PH-FSIM PUK,0,0
```

OK

3.10.4. AT+CPIN2 - Enter PIN2

This command allows sending to the USIM the PIN2 and the PUK2 if the SIM supports PUK2. If the PUK2 is sent it must be followed by the new PIN2.



3GPP TS 27.007



AT+CPIN2=<pin>[,<newPin>[,<aid>]]

Parameter:

Name	Type	Default	Description
<pin>	string	-	value of PIN2 or PUK2
<newpin>	string	-	value of new PIN2 if SIM contains PUK2
<aid>	string	-	Application ID, if omitted USIM application is used



Enter PIN2 without aid:

AT+CPIN2=1234

OK

Enter PUK2 and update PIN2 without aid:

AT+CPIN2=12345678,1234

OK

3.10.5. AT+CPOL - Preferred PLMN List

This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC (GSM or USIM).



3GPP TS 27.007



AT+CPOL=[[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<E-UTRAN_AcT>]]]]


Execute command writes an entry in the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, EFPLMNwAcT, is the one accessed by default. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, <GSM_AcT>, <GSM_Compact_AcT> and <UTRAN_AcT> and <E-UTRAN_AcT> are required when writing User controlled PLMN selector with Access Technology, EFPLMNwAcT, Operator controlled PLMN selector with Access Technology EFOPLMNwAcT and HPLMN selector with Access Technology EFHPLMNwAcT, see 3GPP TS 31.102 [59].

Parameters:

Name	Type	Default	Description
<indexn>	integer	N/A	the order number of operator in the SIM/USIM preferred operator list
<format>	integer	N/A	
Values:			
	0	:	Long format alphanumeric <oper>
	1	:	Short format alphanumeric <oper>
	2	:	Numeric <oper>
<opern>	string	-	<format> indicates if the format is alphanumeric or numeric (see +COPS)
<GSM_AcTn>	integer	N/A	GSM access technology.
Values:			
	0	:	Access technology not selected
	1	:	Access technology selected
<GSM_Compact_AcTn>	integer	N/A	GSM compact access technology
Values:			
	0	:	Access technology not selected
	1	:	Access technology selected
<UTRAN_AcTn>	integer	N/A	UTRA 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

 NOTE1 : MT can also update the User controlled PLMN selector with Access Technology, EFPLMNwAcT, automatically when new networks are selected.

NOTE2 : The Operator controlled PLMN selector with Access Technology EFOPLMNwAcT, can only be written if the write access condition in the SIM/USIM has been previously verified.

 **AT+CPOL?**

Read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS, with the Access Technologies for each PLMN in the list.

+CPOL:[<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<EUTRAN_AcT1>][<CR><LF>+CPOL:<index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<E-UTRAN_AcT2>] [...]]

 **AT+CPOL=?**

Test command returns the whole index range supported by the SIM.

+CPOL: (list of supported <index>s),(list of supported <format>s)

3.10.6. AT+CPWD - Change Facility Password

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK.



See the current implementation limitation in the parameters description.



3GPP TS 27.007



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

Parameters:

Name	Type	Default	Description
<fac>	string	N/A	Facility. See 10.1 Facility Lock: +CLCK on page 235 for other values.
Values:			
"P2"	:	SIM PIN2	
"SC"	:	SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power up and when this lock command issued)	
<oldpwd>	string	-	<oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD; maximum length of password can be determined with <pwdlength>.
<newpwd>	string	-	<newpwd> is the new password; maximum length of password can be determined with <pwdlength>.



Only the "SC" and "P2" facilities are currently implemented.



AT+CPWD=?

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

+CPWD: list of supported (<fac>,<pwdlength>)s

Additional info:

▶▶ the available facilities and the maximum length of their password

Name	Type	Default	Description
<fac>	string	-	facility
<pwdlength>	integer	-	Maximum length of the password for the facility

3.10.7. AT+CRSM - Restricted SIM access

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database.



3GPP TS 27.007



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

Set command transmits to the MT the SIM <command> and its required parameters. If a SIM installed in the currently selected card slot, the MT handles internally all SIM MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters. Refer to Section Mobile Termination Error Result Code: +CME ERROR for details on <err>. Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation dependent.

However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

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

For parameters meanings see Additional info section.

Parameters:

Name	Type	Default	Description
<command>	integer	N/A	command passed on by the MT to the SIM. refer 3GPP TS 51.011 [28].
Values:			
176	:	READ BINARY	
178	:	READ RECORD	
192	:	GET RESPONSE	
214	:	UPDATE BINARY	
220	:	UPDATE RECORD	
242	:	STATUS	
203	:	RETRIEVE DATA	
219	:	SET DATA	
<fileid>	integer	-	Identifier of a elementary datafile on SIM. Mandatory for every command except STATUS
<P1>	integer	N/A	Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP TS 51.011.
<P2>	integer	N/A	Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP TS 51.011.
<P3>	integer	N/A	Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET

			RESPONSE and STATUS. The values are described in 3GPP TS 51.011.
<data>	hex	-	Information which shall be written to the SIM. See also Section Select TE Character Set: +CSCS.
<pathid>	string	-	Path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60].

Additional info:

▶▶ Response data fields:

Name	Type	Default	Description
<sw1>	integer	-	Information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command
<sw2>	integer	-	Information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command
<response>	hex	-	Response of a successful completion of the command previously issued. See also Section Select TE Character Set: +CSCS. STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer 3GPP TS 51.011 [28]). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command.

NOTE1 : command, all other values are reserved.

NOTE2 : The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.

NOTE3 : The range of valid file identifiers depends on the actual SIM and is defined in 3GPP TS 51.011 [28]. Optional files may not be present at all.

NOTE4 : Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the <pathid> indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if <pathid> is omitted, it could be implementation specific which one will be selected



AT+CRSM=?

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

3.10.8. AT+CSIM - Generic SIM Access

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.



[1] 3GPP TS 11.11



AT+CSIM=<length>,<command>

The “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. See also Mobile Termination Error Result Code: +CME ERROR for <err> values.

+CSIM: <length>,<response>

Error case:

+CME ERROR: <err>

Parameters:

Name	Type	Default	Description
<length>	integer	-	Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response).
<command>	hex	-	Command passed on by the MT to the SIM in the format as described in 3GPP TS 51.011 [28]. See also Section Select TE Character Set: +CSCS.

Additional info:

- ▶▶ List of the meaning of the response messages parameters.

Name	Type	Default	Description
<response>	hex	-	response to the command passed on by the SIM to the MT in the format as described in 3GPP TS 51.011 [28]. See also Section Select TE Character Set: +CSCS.



AT+CSIM=?



Compared to Restricted SIM Access command +CRSM, the definition of +CSIM allows TE to take more control over the SIM MT interface. The locking and unlocking of the interface may be done 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.

3.10.9. AT+SRSM - Restricted SIM Access with Application ID

This command allows to send SIM <command> and its required parameters with a particular Application Id. The DF name is the AID and shall be unique within a card. A DF name is coded on 1 to 16 bytes. AID is obtained by reading EFdir.



3GPP TS 27.007



AT+SRSM=<command>, <aid>[, <fileid>[,<P1>,<P2>,<P3>[,<data>[, <pathid>]]]]

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

Parameter:

Name	Type	Default	Description
<command>	string	-	value of PIN2 or PUK2
<aid>	string	-	String type in hexadecimal character format, up to 16 bytes. Application ID.
<fileid>	integer	-	This is the identifier of a elementary datafile on SIM. Refer to command Restricted SIM Access: +CRSM.
<P1>	integer	-	The arameters passed on by the MT to the SIM. Refer to command Restricted SIM Access: +CRSM.
<P2>	integer	-	The arameters passed on by the MT to the SIM. Refer to command Restricted SIM Access: +CRSM.
<P3>	integer	-	The arameters passed on by the MT to the SIM. Refer to command Restricted SIM Access: +CRSM.
<data>	string	-	The information which shall be written to the SIM. Refer to command Restricted SIM Access: +CRSM.
<pathid>	string	-	The information which shall be written to the SIM. Refer to command Restricted SIM Access: +CRSM.

Additional info:

- ▶▶ List of the meaning of the response messages parameters.

Name	Type	Default	Description
<sw1>	integer	-	The information from the SIM about the execution of the actual command. Refer to command Restricted SIM Access: +CRSM.
<sw2>	integer	-	The information from the SIM about the execution of the actual command. Refer to command Restricted SIM Access: +CRSM.



AT+SRSM=?



Status on the ISIM application

AT+SRSM=242,A0000000871004010203040506070809

SRSM=144,0,62288202782183023F00A50880017183030343B68A01058B032F0602C60

C90016083010183010A830181

4. LIST OF ACRONYMS

Acronym	Meaning
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

5. DOCUMENT HISTORY

Revision	Date	Changes
0	2020-09-17	Initial release



SUPPORT INQUIRIES

Link to www.telit.com and contact our technical support team for any questions related to technical issues.

www.telit.com



Telit Communications S.p.A.
Via Stazione di Prosecco, 5/B
I-34010 Sgonico (Trieste), Italy

Telit Wireless Solutions Inc.
3131 RDU Center Drive, Suite 135
Morrisville, NC 27560, USA

Telit Wireless Solutions Ltd.
10 Habarzel St.
Tel Aviv 69710, Israel

Telit IoT Platforms LLC
5300 Broken Sound Blvd, Suite 150
Boca Raton, FL 33487, USA

Telit Wireless Solutions Co., Ltd.
8th Fl., Shinyoung Securities Bld.
6, Gukjegeumyung-ro8-gil, Yeongdeungpo-gu
Seoul, 150-884, Korea

Telit Wireless Solutions
Tecnologia e Servicos Ltda
Avenida Paulista, 1776, Room 10.C
01310-921 São Paulo, Brazil