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FIBOCOM L860 AT Commands

User Manual

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Applicability Type

No.	Type	Note
1	L860-GL	NA

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Versions

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Version	Author	Date	Remarks
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1 Preface

1.1 Target Audience

This manual is intended for the developers who need to communicate with the L8 family devices using the AT commands.

2 Introduction to AT Commands

2.1 AT Commands Overview

AT commands are sets of commands used for communication with the cellular modem. AT commands are comprised of assemblies of ASCII characters which start with the "AT" prefix (except the commands *A/* and *+++*). The AT prefix is derived from the word Attention, which asks The modem to pay attention to the current request (command).

AT commands are used to request services from the cellular modem, such as:

- ◆ Call services: dial, answer and hang up
- ◆ Cellular utilities: send/receive SMS
- ◆ Modem profiles: Auto Answer
- ◆ Cellular Network queries: GSM signal quality

2.2 General System Abbreviations

The basic system configuration contains a modem and a terminal.

The L8 family is the modem unit and may be referred to as the DCE or TA, such as the phone, the mobile or the radio.

The terminal (PC or MCU) may be referred to as the DTE or the TE.

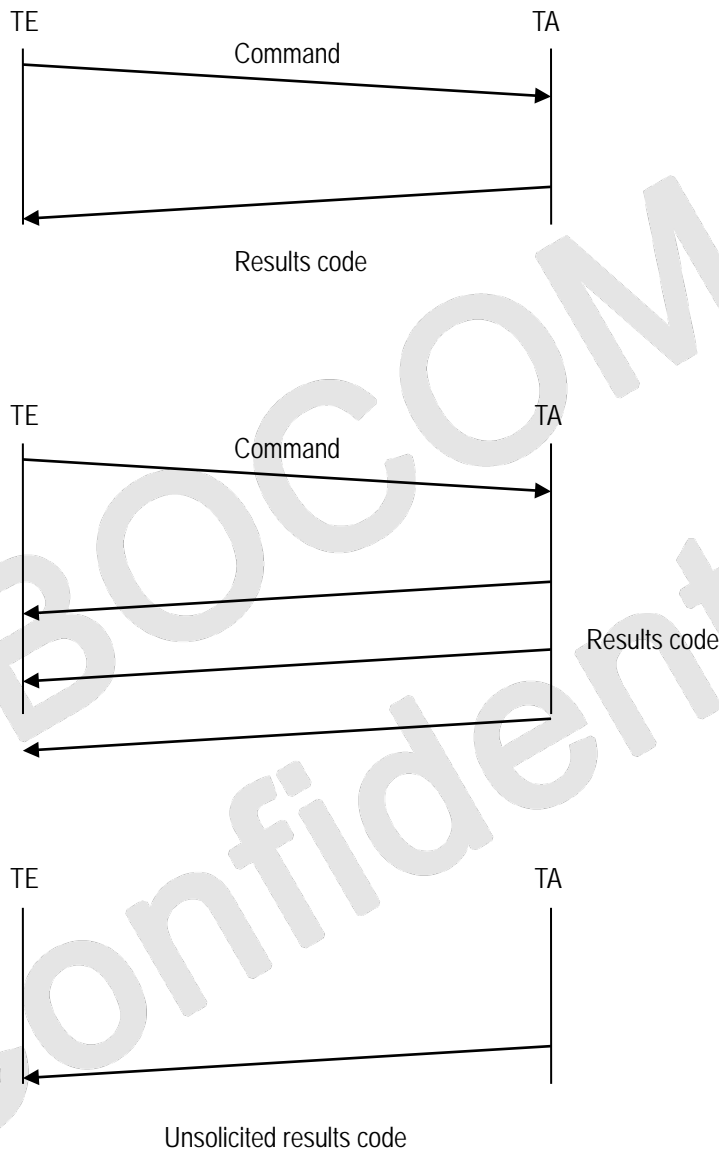
2.3 AT Commands Protocol

The AT commands interface is basically a Modem Services upon Request.

Communication (almost) always begins from the TE side. This means that any service should be requested from the TE. Thus a request is called a "Command".

Each command must be answered by a "Results code" from the TA. The results code reports the command status to the TE. Some commands may include several "Results code" to send data back to the TE. Some commands may initiate a mode in which, when specified events are generated in the modem, "Indicator" messages are sent data asynchronously. The "indicators" can be called "Unsolicited results code".

The Modem can echo characters received from the TE (commands) back to the TE.



2.4 Manual Scope

This manual introduces the AT commands set of L8 family products, and describes how the users can communicate with the devices using these commands. It describes the specification of syntax and parameters of the listed AT commands.

2.5 AT Commands Structure

2.4.1 General Symbols Used in AT Commands Description

The following syntax definitions apply in this chapter:

Syntax	Definition
<CR>	Carriage returns character, specified by the value of the S3-register.
<LF>	Line-feed character, specified by the value of the S4-register.
<...>	Name enclosed in angle brackets is a syntax element. The brackets themselves do not appear in the command line.
[...]	Optional sub-parameter of a command or an optional part of terminal information response, enclosed in square brackets. The brackets themselves do not appear in the command line. When the sub-parameter is not provided in the parameter type commands, the new value equals its previous value. In action type commands, the action should be performed on the basis of the recommended default setting of the sub-parameter.
//	Denotes a comment, and should not be included in the command.

2.4.2 Command Structure

Each AT command has the "AT" or "at" prefix string (except the commands A/ and +++).

Each AT command has the suffix <CR> (except the commands A/ and +++).

Example:

AT+CSQ<CR>

An AT command line may contain one or more commands. Delimiters are used to separate the commands from each other. The delimiter is either a semicolon ";" or none, meaning space (basic commands).

Example:

ATS0=1V1Q0E0<CR>

AT+IFC=0,0;+ICF=3,4;+CNMI=2,1,0,0,0<CR>

2.4.3 Results Code Structure

By default, the Modem responds with verbose response codes. The results code prefix is <CR><LF>. The results code suffix is <CR><LF>.

Example:

```
<CR><LF>+CSQ: 99,99<CR><LF>
<CR><LF>OK<CR><LF>
```

The unsolicited results code is same as the Results code.



Note:

- The <CR> and <LF> characters are not explicitly presented in the response format in this document.
- To reduce the print length the empty line in actual response may be removed in the examples.

2.6 Command Syntax

Execute command syntax	AT+xxx ATxxx ATxxx;
Parameter set command syntax	AT+xxx=<Value> ATxxx=<Value>
Parameter read Command syntax	AT+xxx? ATxxx?
Parameter test Command syntax	AT+xxx=? ATxxx=?

<Value> consists of either a numeric constant or a string constant. <compound_value> consist of several <value> parameters separated by commas.

Example of compound_value: <value1>, <value2>, ..., <valueN>

◆ **Numeric Constants**

Numeric constants are expressed in decimal, hexadecimal, or binary form. In the Modem, the definition of each command specifies which form is used for values associated with that command.

◆ **String Constants**

String constants consist of a sequence of characters, bounded at the beginning and end by the double-quote character (").

3 Modem Information

These commands allow the user to query the type of device that is attached, the technology used in the device, as well as basic operating information about the modem unit.

3.1 Modem ID

3.1.1 +CGMI, Request Manufacturer ID

This command displays the manufacturer identification. The modem unit outputs a string containing manufacturer identification information.

Command	Description
Execution	<p>[Function] The Execution command displays manufacture identification. The modem unit outputs a string containing manufacture identification information.</p> <p>[Syntax] AT+CGMI</p> <p>[Response/Action] +CGMI: "<manufacture ID>" OK</p>
Read	<p>[Function] The Read command displays manufacture identification. The modem unit outputs a string containing manufacture identification information.</p> <p>[Syntax] AT+CGMI?</p> <p>[Response/Action] +CGMI: "<manufacture ID>" OK</p>
Test	N/A
Parameters	N/A
Example	<p>AT+CGMI</p> <p>+CGMI: "Fibocom"</p>

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Command	Description
	OK
Reference	3GPP TS 27.007

3.1.2 +GMI, Request Manufacturer ID

This command displays manufacturer identification. The modem unit outputs a string containing manufacturer identification information.

Command	Description
Execution	<p>[Function] The Execution command displays manufacture identification. The modem unit outputs a string containing manufacture identification information.</p> <p>[Syntax] AT+GMI</p> <p>[Response/Action] +GMI: "<manufacture ID>" OK</p>
Read	<p>[Function] The Read command displays manufacture identification. The modem unit outputs a string containing manufacture identification information.</p> <p>[Syntax] AT+GMI?</p> <p>[Response/Action] +GMI: "<manufacture ID>" OK</p>
Test	N/A

Command	Description
Parameters	N/A
Example	AT+GMI +GMI: "Fibocom" OK

3.1.4 +CGMM, Request Model ID

This command requests the model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Command	Description
Execution	<p>[Function] The Execution command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+CGMM</p> <p>[Response/Action] +CGMM: "<list of supported technologies>","<model>" OK</p>
Read	<p>[Function] The Read command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+CGMM?</p>

Command	Description
	<p>[Response/Action] +CGMM: "<list of supported technologies>", "<model>"</p> <p>OK</p>
Test	N/A
Parameters	N/A
Example	<p>AT+CGMM +CGMM: "L860 LTE Module", "L860"</p> <p>OK</p>
Reference	3GPP TS 27.007

3.1.5 +GMM, Request Model ID

This command requests the model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Command	Description
Execution	<p>[Function] The Executions command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+GMM</p> <p>[Response/Action] +GMM: "<list of supported technologies>", "<model>"</p> <p>OK</p>
Read	[Function]

Command	Description
	<p>The Read command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+GMM?</p> <p>[Response/Action] +GMM: "<list of supported technologies>","<model>" OK</p>
Test	N/A
Parameters	N/A
Example	<p>AT+GMM +GMM: "L860 LTE Module","L860" OK</p>

3.1.6 +FMM, Request Model ID

This command requests the model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Command	Description
Execution	<p>[Function] The Execution command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+FMM</p> <p>[Response/Action]</p>

Command	Description
	+FMM: "<list of supported technologies>","<model>" OK
Read	<p>[Function] The Read command displays model identification. The modem outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.</p> <p>[Syntax] AT+FMM?</p> <p>[Response/Action] +FMM: "<list of supported technologies>","<model>" OK</p>
Test	N/A
Parameters	N/A
Example	AT+FMM +FMM: "L860 LTE Module","L860" OK

3.1.7 +CGMR, Request Revision

This command requests the revision identification. The modem outputs a string containing the revision identification information of the software running in the device.

Command	Description
Execution	<p>[Function] The Execution command requests the revision identification. The modem outputs a string containing the revision identification information of the software running in the device.</p> <p>[Syntax] AT+CGMR</p>

Command	Description
	<p>[Response/Action] +CGMR: "<revision>"</p> <p>OK</p>
Read	<p>[Function] The Read command requests the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.</p> <p>[Syntax] AT+CGMR?</p> <p>[Response/Action] +CGMR: "<revision>"</p> <p>OK</p>
Test	N/A
Parameters	N/A
Example	<p>AT+CGMR</p> <p>+CGMR: "18600.5001.00.35.00.13"</p> <p>OK</p>
Reference	3GPP TS 27.007

3.1.8 +GMR, Request Revision

These commands request the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.

Command	Description
Execution	<p>[Function] The Execution command requests the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.</p> <p>[Syntax] AT+GMR</p>

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Command	Description
	<p>[Response/Action] +GMR: "<revision>"</p> <p>OK</p>
Read	<p>[Function] The Read command requests the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.</p> <p>[Syntax] AT+GMR?</p> <p>[Response/Action] +GMR: "<revision>"</p> <p>OK</p>
Test	N/A
Parameters	N/A
Example	<p>AT+GMR</p> <p>+GMR: "18600.5001.00.35.00.13"</p> <p>OK</p>

3.1.9 +FMR, Request Revision

These commands request the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.

Command	Description
Execution	<p>[Function] The Execution command requests the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device.</p> <p>[Syntax]</p>

Command	Description
	AT+FMR [Response/Action] +FMR: "<revision>" OK
Read	[Function] The Read command requests the revision identification. The modem outputs a string containing the revision identification information of the software version contained within the device. [Syntax] AT+FMR? [Response/Action] +FMR: "<revision>" OK
Test	N/A
Parameters	N/A
Example	AT+FMR +FMR: "18600.5001.00.35.00.13" OK

3.1.10 +CGSN, Request Product Serial Number Identification

This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.

Command	Description
Execution	[Function] This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.

Command	Description
	<p>[Syntax] AT+CGSN</p> <p>[Response/Action] <imei></p> <p>OK</p>
Read	<p>[Function] This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.</p> <p>[Syntax] AT+CGSN?</p> <p>[Response/Action] +CGSN: "<imei>"</p> <p>OK</p>
Test	N/A
Parameters	<p>The IMEI (International Mobile Station Equipment Identity) number is composed of 15 digits, as specified by 3GPP TS 23.003. IMEI numbers are composed of the following elements, all in decimal digits:</p> <ul style="list-style-type: none"> Type Approval Code (TAC) - 8 digits Serial Number (SNR) - 6 digits Spare digit - 1 digit <p>The TAC and SNR are protected against unauthorized changes.</p>
Example	<p>AT+CGSN?</p> <p>+CGSN: "865204020007540"</p> <p>OK</p> <p>AT+CGSN</p> <p>865204020007540</p> <p>OK</p>
Reference	3GPP TS 27.007

3.1.11 +GSN, Request Product Serial Number Identification

This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.

Command	Description
Execution	<p>[Function] This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.</p> <p>[Syntax] AT+GSN</p> <p>[Response/Action] +GSN: "<imei>" OK</p>
Read	<p>[Function] This command displays the product serial number identification IMEI (International Mobile Equipment Identification). It can be used even when the SIM card is not inserted.</p> <p>[Syntax] AT+GSN?</p> <p>[Response/Action] +GSN: "<imei>" OK</p>
Test	N/A
Parameters	<p>The IMEI (International Mobile Station Equipment Identity) number is composed of 15 digits, as specified by 3GPP TS 23.003. IMEI numbers are composed of the following elements, all in decimal digits:</p> <ul style="list-style-type: none"> Type Approval Code (TAC) - 8 digits Serial Number (SNR) - 6 digits Spare digit - 1 digit

Command	Description
	The TAC and SNR are protected against unauthorized changes.
Example	AT+GSN +GSN: "865204020007540" OK

3.1.12 +CSCS, Select Terminal Character Set

This command selects the Modem character set. The modem supports the following character sets: "IRA", "GSM", "UCS2", "HEX". The default value is "IRA".

Command	Description
Set	<p>[Function] This command selects the Modem character set. The modem supports the following character sets: "IRA", "GSM", "UCS2", "HEX". The default value is "IRA".</p> <p>[Syntax] AT+CSCS=<chset></p> <p>[Response/Action] OK or: +CMS ERROR: <err></p>
Read	<p>[Function] This command returns the current character set.</p> <p>[Syntax] AT+CSCS?</p> <p>[Response/Action] +CSCS: <selected character set> OK</p>
Test	<p>[Function] This command returns the list of supported character sets.</p> <p>[Syntax] AT+CSCS=?</p>

Command	Description
	<p>[Response/Action]</p> <p>+CSCS: (<supported character sets>)</p> <p>OK</p>
Parameters	<p><chset> Character Set</p> <p>"IRA" International Reference Alphabet (ITU-T T.50)</p> <p>"GSM" GSM default alphabet (GSM 03.38 subclause 6.2.1)</p> <p>"UCS2" 2-byte Universal Character Set, Unicode (ISO/IEC 10646 [32])</p> <p>"HEX" Character strings consist only of hexadecimal numbers from 00 to FF</p>
Example	<pre> AT+CSCS=? +CSCS: ("UCS2", "IRA", "HEX", "GSM") OK AT+CSCS? +CSCS: "IRA" OK AT+CPBS="SM" OK AT+CPBW=1,"8475763000",129,"Lin Zhao" +CPBW: 1 OK AT+CSCS="UCS2" OK AT+CPBR=1 +CPBR: 1,"8475763000",129,"004C0069006E0020005A00680061006F" OK </pre>
Reference	3GPP TS 27.007

3.1.13 +CIMI, Request IMSI

This command displays the International Mobile Subscriber Identity number.

Command	Description
Execution	<p>[Function] This command displays the International Mobile Subscriber Identity number.</p> <p>[Syntax] AT+CIMI</p> <p>[Response/Action] <imsi> OK or: +CME ERROR: <err></p>
Read	N/A
Test	N/A
Parameters	N/A
Example	<p>AT+CIMI</p> <p>314566320021400</p> <p>OK</p>
Reference	3GPP TS 27.007

3.1.14 +CFSN, Read Factory Serial Number

This command display the factory serial number.

Command	Description
Set	<p>[Function] This command is used to query or set the factory serial number.</p> <p>[Syntax] to query the factory serial number use Execution command: AT+CFSN to set the factory serial number use Set command: AT+CFSN=<fsn></p> <p>[Response/Action] For Execute command: +CFSN: "<fsn>" OK</p>

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Command	Description
	For Set command: OK
Read	<p>[Function] This command is used to query the factory serial number. The usage is same as an Execution command.</p> <p>[Syntax] AT+CFSN?</p> <p>[Response/Action] +CFSN: "<fsn>" OK</p>
Test	N/A
Parameters	<fsn> A 10-char string containing characters in set <A-Z> and <0-9>
Example	AT+CFSN +CFSN: "1234567890" OK

3.1.15 I, Request Identification Information

This command displays various modem information items.

Command	Description								
Execution	<p>[Function] This command displays various modem information items.</p> <p>[Syntax] ATIn</p> <p>[Response/Action] <information item n> or: +CME ERROR: <err></p>								
Read	N/A								
Test	N/A								
Parameters	<table border="1"> <thead> <tr> <th>ATIn</th> <th>Description</th> <th>Output (Just Demo)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>ATI</td> <td>Same as ATIO</td> <td>".Built@Jul 24 2014:10:15:45"</td> <td></td> </tr> </tbody> </table>	ATIn	Description	Output (Just Demo)	Remark	ATI	Same as ATIO	".Built@Jul 24 2014:10:15:45"	
ATIn	Description	Output (Just Demo)	Remark						
ATI	Same as ATIO	".Built@Jul 24 2014:10:15:45"							

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Command	Description																														
	<table> <tr> <td>ATI0</td> <td>Build time</td> <td>".Built@Jul 24 2014:10:15:45"</td> </tr> <tr> <td>ATI1</td> <td>Reserve</td> <td>"Reserve"</td> </tr> <tr> <td>ATI2</td> <td>Reserve</td> <td>"Reserve"</td> </tr> <tr> <td>ATI3</td> <td>Product description</td> <td>"Fibocom LTE Module"</td> </tr> <tr> <td>ATI4</td> <td>Reserve</td> <td>"Reserve"</td> </tr> <tr> <td>ATI5</td> <td>Platform</td> <td>"XMM7560"</td> </tr> <tr> <td>ATI6</td> <td>Reserve</td> <td>"Reserve"</td> </tr> <tr> <td>ATI7</td> <td>Product description</td> <td>"L860 LTE Module"</td> </tr> <tr> <td>ATI8</td> <td>Software version</td> <td>"18600.5001.00.01.00.01"</td> </tr> <tr> <td>ATI9</td> <td>Hardware version</td> <td>"V1.1"</td> </tr> </table>	ATI0	Build time	".Built@Jul 24 2014:10:15:45"	ATI1	Reserve	"Reserve"	ATI2	Reserve	"Reserve"	ATI3	Product description	"Fibocom LTE Module"	ATI4	Reserve	"Reserve"	ATI5	Platform	"XMM7560"	ATI6	Reserve	"Reserve"	ATI7	Product description	"L860 LTE Module"	ATI8	Software version	"18600.5001.00.01.00.01"	ATI9	Hardware version	"V1.1"
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ATI4	Reserve	"Reserve"																													
ATI5	Platform	"XMM7560"																													
ATI6	Reserve	"Reserve"																													
ATI7	Product description	"L860 LTE Module"																													
ATI8	Software version	"18600.5001.00.01.00.01"																													
ATI9	Hardware version	"V1.1"																													
Example	<pre> ati0i1i2i3i4i5i6i7i8i9 ".Built@Sep 22 2015:10:37:01" "Reserve" "Reserve" "Fibocom LTE Module" "Reserve" "XMM7560" "Reserve" "L860 LTE Module" "18600.5001.00.01.00.01" "V1.1" OK </pre>																														

3.1.16 +CNUM, Request MSISDN(s)

This command displays up to 2 strings of text information that identify the modem. The output string contains double quotes.

On SIM cards that have EFmsisdn file, the string(s) returned are the MSISDN numbers and their associated data.

On SIM cards that don't have EFmsisdn file, the strings returned are the MSISDN numbers and their associated data stored in Modem NVM.

Command	Description
Execution	<p>[Function] This command displays up to 2 strings of text information that identify the modem. The output string contains double quotes.</p> <p>[Syntax] AT+CNUM</p> <p>[Response/Action] +CNUM: [<MSISDN1_string>,<MSISDN1>,<MSISDN1_type><CR><LF> [+CNUM: [<MSISDN2_string>,<MSISDN2>,<MSISDN2_type>]<CR><LF> [...] OK</p>
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+CNUM=?</p> <p>[Response/Action] OK</p>
Read	N/A
Parameters	<p><MSISDN type>: Phone number type</p> <p>129 ISDN / telephony numbering plan, national / international unknown</p> <p>145 ISDN / telephony numbering plan, international number</p> <p>161 ISDN / telephony numbering plan, national number</p> <p>128 - 255 Other values refer 3GPP TS 24.008 [8] subclause 10.5.4.7</p>
Example	<p>AT+CNUM</p> <p>+CNUM: "I","13812345678",129</p> <p>OK</p>
Reference	3GPP TS 27.007

3.1.17 +CLAC, List of All Available AT Commands

This command prints out all AT Commands supported by the Modem.

Command	Description
Execution	<p>[Function] The Execution command displays a list of all the AT commands supported by the Modem.</p> <p>[Syntax] AT+CLAC</p> <p>[Response/Action] List of available AT commands OK</p>
Read	N/A
Test	N/A
Parameters	N/A
Example	<p>AT+CLAC</p> <p>ATS</p> <p>ATD</p> <p>ATA</p> <p>ATO</p> <p>...</p> <p>...</p> <p>OK</p>
Reference	3GPP TS 27.007

4 Modem Control and Status

4.1 Modem Register Commands

The modem holds certain data items in selected memory space, named Software Registers (S-registers) and Modem Registers. Some of these registers are used as bitmaps, where one register holds more than one data item. All S-registers can be accessed using the S command, described in “S, Bit Map Registers”. Some registers can also be accessed using dedicated commands, detailed below.

4.1.1 V, Modem Response Format

This command determines the response format of the data adapter and the contents of the header and trailer transmitted with the result codes and information responses. This command also determines whether the result codes are transmitted in a numeric or an alphabetic ("verbose") form. The text portion of information responses is not affected by this setting.

The following table shows the effect that setting this parameter has on the format of information text and result codes.

V0	V1	Information Responses
<ATV0><cr><lf>	<ATV1><cr><lf>	0 - "OK"
<numeric code><cr>	<verbose code><cr><lf>	1 - "CONNECT" 2 - "RING" 3 - "NO CARRIER" 4 - "ERROR" 5 - "NO DIALTONE" 6 - "BUSY" 7 - "NO ANSWER"

Command	Description
Execution	<p>[Function] The Execution command sets the format of information responses and result codes.</p> <p>[Syntax] ATV[<value>] If <value> is missing, value "0" is assumed.</p> <p>[Response/Action] If <value>:1 OK or: +CME ERROR: <err> If <value>:0 <numeric code></p>
Read	N/A
Test	N/A

Command	Description
Parameters	<p><value></p> <p>0 Transmits limited headers and trailers, and numeric text.</p> <p>1 Transmits full headers and trailers, and verbose response text.</p> <p>The default value is 1.</p>
Example	<p>ATV1</p> <p>OK</p> <p>ATV00</p>

4.1.2 Q, Result Code Suppression

This command determines whether to output the result codes. Information text transmitted in response to commands is not affected by the setting of this parameter.

Command	Description
Execution	<p>[Function]</p> <p>The Execution commands sets whether or not to output result codes.</p> <p>[Syntax]</p> <p>ATQ<value></p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	N/A
Test	N/A
Parameters	<p><value></p> <p>0 Transmit result codes.</p> <p>1 Suppress result codes.</p> <p>The default value is 0..</p>
Example	<p>ATQ0</p> <p>OK</p> <p>ATQ1</p>

4.1.3 E, Command Echo

This command defines whether input characters are echoed to output. If so, these characters are echoed at the same rate, parity and format at which they were received.

Command	Description
Execution	<p>[Function] The Execution command sets whether or not to echo characters.</p> <p>[Syntax] ATE[<value>]</p> <p>If <value> is missing, value "0" is assumed.</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	N/A
Test	N/A
Parameters	<p><value></p> <p>0 Does not echo characters</p> <p>1 Echoes characters</p> <p>The default value is 1.</p>
Example	<p>ATE1</p> <p>OK</p>

4.1.4 X, Result Code Selection and Call Progress Monitoring Control

This command defines the CONNECT result code format. It determines whether or not the Modem transmits particular result codes to the user. It also controls whether the Modem verifies the presence of dial tone when it first goes off-hook to begin dialing, and whether the engaged tone (busy signal) detection is enabled.

Command	Description
Execution	<p>[Function] The Execution command sets the result code and call progress monitoring control.</p> <p>[Syntax] ATX<value></p>

Command	Description
	<p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	N/A
Test	N/A
Parameters	<p><value></p> <p>0 CONNECT result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Disabled</p> <p>1 CONNECT <text> result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Disabled</p> <p>2 CONNECT <text> result code given upon entering online data state: Dial tone detection - Enabled Busy detection - Disabled</p> <p>3 CONNECT <text> result code given upon entering online data state: Dial tone detection - Disabled Busy detection - Enabled</p> <p>4 CONNECT <text> result code given upon entering online data state: Dial tone detection - Enabled Busy detection – Enabled</p> <p>The default value is 4.</p>
Example	<p>ATX3</p> <p>OK</p> <p>ATX4</p> <p>OK</p>

4.1.5 S, Bit Map Registers

This command reads/writes values of the S-registers. The Modem supports this command for various S values, according to official specifications (ITU-I, ETSI, or manufacturer specific).

Command	Description										
Set	<p>[Function] The Set command is allowed for read/write S-registers, and not allowed for read-only S-registers.</p> <p>[Syntax] ATSn=<value></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>										
Read	<p>[Function]</p> <p>[Syntax] ATSn?</p> <p>[Response/Action] <current value of S-register n> OK or: +CME ERROR: <err></p>										
Test	N/A										
Parameters	<table border="1"> <thead> <tr> <th>Sn</th> <th>Description</th> <th>Min Value</th> <th>Max Value</th> <th>Default Value</th> </tr> </thead> <tbody> <tr> <td>S0</td> <td>Sets/gets number of rings before auto answer.</td> <td>0</td> <td>255</td> <td>0</td> </tr> </tbody> </table>	Sn	Description	Min Value	Max Value	Default Value	S0	Sets/gets number of rings before auto answer.	0	255	0
Sn	Description	Min Value	Max Value	Default Value							
S0	Sets/gets number of rings before auto answer.	0	255	0							
Example	<pre> ATS0? 000 OK ATS0=128 OK ATS0? 128 </pre>										

Command	Description
	OK

4.1.6 &F, Set to Factory Defined Configuration

This command restores the factory default configuration profile. The Modem only supports one factory default profile, 0.

Command	Description
Set	<p>[Function]</p> <p>This is a dummy command in L8 family. It returns OK and has no actual effect.</p> <p>[Syntax]</p> <p>AT&F<value></p> <p>[Response/Action]</p> <p>OK</p>
Read	N/A
Test	N/A
Parameters	This is a dummy command and any integer value following &F is accepted.
Example	<p>AT&F</p> <p>OK</p>

4.1.7 Z, Reset to Default Configuration

This command drops the current call, and resets the values to default configuration.

Command	Description
Execution	<p>[Function]</p> <p>[Syntax]</p> <p>ATZ<value></p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	N/A

Command	Description
Test	N/A
Parameters	<p><value></p> <p>0 Set to user profile 0</p> <p>1 Set to user profile 1</p> <p>The default value is 0.</p>
Example	<p>ATZ1</p> <p>OK</p> <p>ATZ0</p> <p>OK</p>

4.1.8 +CRSM, Restricted SIM Access

This command provides limited access to the Elementary Files on the SIM. Access to the SIM database is restricted to the commands which are listed at <command>. All parameters of AT+CRSM are used as specified by 3GPP TS 51.011(2G) and TS 31.101(3G). As response to the command, the Modem sends the actual SIM information parameters and response data. Error result code "+CME ERROR" may be returned if the command cannot be transferred to the SIM, e.g. if the SIM is not inserted, or defected, or PIN1/PUK authentication required, or required input parameters not present. However, failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Some of the AT+CRSM commands require PIN/PIN2 authentication.

Command	Description
Set	<p>[Function]</p> <p>Set command transmits the SIM <command> and its required parameters to the ME. ME sends the actual SIM information parameters and response data.</p> <p>[Syntax]</p> <p>AT+CRSM=<command>[,<file_id>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]</p> <p>[Response/Action]</p> <p>+CRSM:</p> <p><sw1>,<sw2>[,<response>]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>

Command	Description
Read	N/A
Test	<p>[Function] The test command only returns OK.</p> <p>[Syntax] AT+CRSM=?</p> <p>[Response/Action] OK</p>
Parameters	<p><command> Integer type. Command passed on by the ME to the SIM. 176 Read BINARY 178 Read RECORD 192 Get RESPONSE 214 Update BINARY 220 Update RECORD 242 STATUS</p> <p><file_id> Integer type. This is the identifier of a elementary data file on SIM. Mandatory for every <command> except of STATUS.</p> <p><P1>,<P2>,<P3> Integer type. Parameters passed on by the ME to the SIM. These parameters are man-datory for every command, except GET RESPONSE and STATUS.</p> <p>READ BINARY <P1> Offset high (0...255) <P2> Offset low (0...255) <P3> Length (0...255)</p> <p>READ RECORD <P1> Rec. No. (0...255) <P2> Mode "02" = next record "03" = previous record "04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record. <P3> Length (0...255)</p> <p>GET RESPONSE</p>

Command	Description
	<p><P1> "00"</p> <p><P2> "00"</p> <p><P3> Length (0...255)</p> <p>UPDATE BINARY</p> <p><P1> Offset high (0...255)</p> <p><P2> Offset low (0...255)</p> <p><P3> Length (0...255)</p> <p>UPDATE RECORD</p> <p><P1> Rec. No. (0...255)</p> <p><P2> Mode "02" = next record</p> <p>"03" = previous record</p> <p>"04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record.</p> <p><P3> Length (0...255)</p> <p>STATUS</p> <p><P1> "00"</p> <p><P2> "00"</p> <p><P3> Length (0...255)</p> <p><data> Information which shall be written to the SIM (hexadecimal character format). Man-datory for UPDATE BINARY and UPDATE RECORD.</p> <p><pathid> String type; contains the path of an elementary file on the SIM/USIM in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and USIM case).</p> <p><sw1></p> <p><sw2> Integer character format. 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.</p> <p><sw1>, <sw2></p> <p>integer type containing the SIM information and can be:</p> <p>0x90 0x00 normal entry of the command</p> <p>0x9F 0xXX length XX of the response data</p> <p>0x91 0xXX normal ending of the command, with extra information from the proactive SIM containing a command for the ME. Length 'XX' of the response data</p> <p>0x92 0x0X update successful but after using an internal retry routine X times</p>

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Command	Description
	0x92 0x40 memory problem
	0x94 0x00 no EF selected
	0x94 0x02 out of range (invalid address)
	0x94 0x04 file ID not found; pattern not found
	0x94 0x08 file is inconsistent with the command
	0x98 0x02 no CHV initialized
	0x98 0x04 access cond. Not fullfiled / unsucc. CHV verify authent.failed
	0x98 0x08 in contradiction with CHV status
	0x98 0x10 in contradiction with invalidation status
	0x98 0x40 unsucc. CHV-verif. Or UNBLOCK CHF / CHV blocked /UNBL.blocked
	0x98 0x50 increases can not be performed. Max. value reached
	0x61 0xXX SW2 indicates the number of response bytes still available. Use GET RESPONSE to access this data.
	0x62 0xXX Warning - state unchanged
	0x62 0x00 Warning - no information provided
	0x62 0x81 Warning - part of returned data may be corrupt
	0x62 0x82 Warning - end of file/record reached (bad cmd)
	0x62 0x83 Warning - selected file invalidated
	0x62 0x84 Warning - bad file control information format
	0x63 0xXX Warning - state unchanged
	0x63 0x00 Warning - no information provided
	0x63 0x81 Warning - file filled up with last write
	0x63 0xCx Warning - counter value is x
	0x64 0xXX Error - state unchanged
	0x65 0xXX Error - state changed
	0x65 0x00 Error - no information provided
	0x65 0x81 Error - memory failure 66 xx Security Error
	0x66 0xXX Security Error
	0x67 0xXX incorrect parameter P3
	0x68 0xXX Check Error - CLA function not supported
	0x68 0x00 Check Error - no information provided
	0x68 0x81 Check Error - logical channel not supported

Command	Description
	<p>0x68 0x82 Check Error - secure messaging not supported</p> <p>0x69 0xXX Check Error - command not allowed</p> <p>0x69 0x00 Check Error - no information provided</p> <p>0x69 0x81 Check Error - command incompatible with file structure</p> <p>0x69 0x82 Check Error - security status not satisfied</p> <p>0x69 0x83 Check Error - authentication method blocked</p> <p>0x69 0x84 Check Error - referenced data invalidated</p> <p>0x69 0x85 Check Error - conditions of use not satisfied</p> <p>0x69 0x86 Check Error - command not allowed (no current EF)</p> <p>0x69 0x87 Check Error - expected SM data objects missing</p> <p>0x69 0x88 Check Error - SM data objects incorrect</p> <p>0x6A 0xXX Check Error - wrong parameters</p> <p>0x6A 0x00 Check Error - no information provided</p> <p>0x6A 0x80 Check Error - incorrect parameters in data field</p> <p>0x6A 0x81 Check Error - function not supported</p> <p>0x6A 0x82 Check Error - file not found</p> <p>0x6A 0x83 Check Error - record not found</p> <p>0x6A 0x84 Check Error - not enough memory space in the file</p> <p>0x6A 0x85 Check Error - Lc inconsistent with TLV structure</p> <p>0x6A 0x86 Check Error - inconsistent parameters P1-P2</p> <p>0x6A 0x87 Check Error - Lc inconsistent with P1-P2</p> <p>0x6A 0x88 Check Error - referenced data not found</p> <p>0x6B 0xXX incorrect parameter P1 or P2</p> <p>0x6C 0xXX Check Error - wrong length - xx is the correct length</p> <p>0x6D 0xXX unknown instruction code given in the command</p> <p>0x6E 0xXX wrong instruction class given in the command</p> <p>0x6F 0xXX technical problem with no diagnostic given</p> <p><response> Response of a successful completion of the command previously issued (hexadecimal character uppercase format). STATUS and GET RESPONSE return data, which gives information about the current elementary data file_id. This information includes the type of file and its size (refer to GSM 11.11). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command.</p>

Command	Description
Example	AT+CRSM=242 +CRSM: 144,0,"62218202782183025F3A8A01058B032F0601C60F9001409501088301019501 08830181" OK AT+CRSM=? OK
Reference	3GPP TS 27.007

4.1.9 +CCID

This command returns the card identification number in SIM (SIM file EFICCID, see GSM 11.11 Chap.10.1.1) as string type.

Command	Description
Execution	<p>[Function] This command returns the card identification number in SIM (SIM file EFICCID, see GSM 11.11 Chap.10.1.1) as string type.</p> <p>[Syntax] AT+CCID</p> <p>[Response/Action] +CCID: <ID> OK or: +CME ERROR: <err></p>
Read	<p>[Function] This command returns the card identification number in SIM (SIM file EFICCID, see GSM 11.11 Chap.10.1.1) as string type.</p> <p>[Syntax] AT+CCID?</p> <p>[Response/Action] +CCID: <ID></p>

Command	Description
	OK or: +CME ERROR: <err>
Test	[Function] [Syntax] AT+CCID=? [Response/Action] OK
Parameters	N/A
Example	AT+CCID +CCID: 89860018190839008096 OK

4.1.10 +CSIM, Generic SIM Access

This command allows a direct control of the SIM by a distant application on the TE.

Command	Description
Set	[Function] Set command transmits to the MT the <command> it then shall send as it is to the SIM The <response> is returned in the same manner to the TE. [Syntax] AT+CSIM=<length>,<command> [Response/Action] +CSIM: <length>,<response> OK Or CME ERROR: <error>
Read	N/A
Test	[Function] The test command only returns OK.

Command	Description
	<p>[Syntax] AT+CSIM=?</p> <p>[Response/Action] OK</p>
Parameters	<p><length>: integer type; length of the characters that are sent to TE in <command> or <response></p> <p><command>: command passed on by MT to SIM in hex format</p> <p><response>: response to the command passed on by the SIM to the MT</p>
Example	
Reference	3GPP TS 27.007

4.2 Other Parameter Commands

4.2.1 +CFUN, Set Phone Functionality

This command set the phone functionality.

Command	Description
Set	<p>[Function] The Set command selects the level of functionality <fun> in the modem.</p> <p>[Syntax] AT+CFUN=<fun>[,<rst>]</p> <p>[Response/Action] OK or +CME ERROR: <err></p>
Read	<p>[Function] The Read command displays the current level of functionality.</p>

Command	Description
	<p>[Syntax] AT+CFUN?</p> <p>[Response/Action] +CFUN: <power mode>, <STK_mode> OK or +CME ERROR: <err></p>
Test	<p>[Function] The Test command displays the list of supported functionality settings.</p> <p>[Syntax] AT+CFUN=?</p> <p>[Response/Action] +CFUN: (list of supported <fun>s), (list of supported <rst>s) OK or +CME ERROR: <err></p>
Parameters	<p><fun> Functionality levels:</p> <ul style="list-style-type: none"> 0 Turn off (With logging out network). 1 Full functionality meaning start up MS(from offline mode) 4 Disables phone transmit & receive RF circuits – Flight mode. 6 Enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 7 Disables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card. 8 Disable fetching of proactive commands by SIM-APPL from the SIM-card. 15 Mode to simulate reset (this will reset MS including SIM) 16 Mode to perform hidden reset (this will reset MS without resetting SIM). 27 Mode to perform reset of SIM and restore previous PIN validation state (this will reset SIM without resetting MS). 31 Mode to Disable Single Stack with an option to Power-Off/Power-On Single (U)SIM card.

Command	Description
	<p>32 Mode to Disable all Stacks with an option to Power-Off/Power-On Single (U)SIM card</p> <p>33 Mode to Enable Single Stack with an option to reset (U)SIM card.</p> <p>34 Mode to Enable All Stacks with an option to reset (U)SIM cards.</p> <p>35 Mode to Power-Off/Power-On Single (U)SIM card.</p> <p>36 Mode to Power-Off/Power-On All (U)SIM cards.</p> <p>37 Mode to Reset Single Stack.</p> <p>38 Mode to Reset All Stacks.</p> <p>40 Mode to start/stop net forced idle mode mode(Automatic or Manual). If Manual, this command will trigger attach in manual mode without providing a PLMN. The last selection mode(Automatic or Manual modes) will be maintained in NVM as part of AT+COPS command.</p> <p><rst></p> <p>is reset value and its values can be:</p> <p>Following values applies only for <fun> values 1 and 4.</p> <p>0 Do not reset MT before resetting it to <fun> power level. (default)</p> <p>1 Reset MT before setting it to <fun> power level</p> <p>Following values applies only for <cfun> values 33 and 34.</p> <p>0 Sim reset not needed.</p> <p>1 Sim reset is needed.</p> <p>Following values applies only for <cfun> values 35 and 36.</p> <p>0 Sim is switched OFF.</p> <p>1 Sim is switched ON.</p> <p>Following values applies only for <fun> values 31 and 32.</p> <p>0 sim is switched OFF.</p> <p>1 Sim is switched ON.</p> <p>Following values applies only for <fun> value 27.</p> <p>0 Hidden Reset of Sim(Sim reset is not informed to MS).</p> <p>1 Normal reset of Sim(Sim reset will be informed to MS).</p> <p><power mode></p> <p>1 MS is switched on</p> <p>2 Invalid mode</p> <p>4 Flight mode</p>

Command	Description
	<p><STK_mode></p> <p>0 Inactive state</p> <p>6 Enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card.</p> <p>7 Disables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card.</p> <p>8 Disable fetching of proactive commands by SIM-APPL from the SIM-card.</p>
Example	<pre> AT+CFUN=? +CFUN: (0,1,4-8,15,16,26,27,31-38,40),(0,1) OK AT+CFUN? +CFUN: 1,0 OK AT+CFUN=4 //Disable phone transmit and receive RF circuits OK AT+CFUN? +CFUN: 4,0 OK AT+COPS? +COPS: 2 OK AT+CFUN=1 // Enable phone transmit and receive RF circuits through '1' OK OK AT+CFUN? +CFUN: 1,0 OK AT+COPS? +COPS: 0,0,"CHINA MOBILE" OK </pre>
Reference	3GPP TS 27.007

4.2.2 +MSMPD, Enable/Disable SIM card hot plug

This command can Enable/Disable SIM card hot plug feature. The default status is enable this feature.

The parameter will be saved in NVM and can restore at power cycle.

Command	Description
Set	<p>[Function] Enable/Disable SIM card hot plug</p> <p>[Syntax] AT+MSMPD=< status></p> <p>[Response/Action] OK Or: +CME ERROR: <err></p>
Read	<p>[Function] Read the current status</p> <p>[Syntax] AT+MSMPD?</p> <p>[Response/Action] +MSMPD: <status> OK</p>
Test	<p>[Function] Return the list of supported value.</p> <p>[Syntax] AT+MSMPD=?</p> <p>[Response/Action] +MSMPD: <list of supported status> OK</p>
Parameters	<p><status></p> <p>0: Disable the SIM card hot plug feature 1: Enable the SIM card hot plug feature The default value is 1</p>
Example	<p>AT+MSMPD=? +MSMPD: (0,1)</p>

Command	Description
	OK AT+MSMPD? +MSMPD: 1 OK AT+MSMPD=0 OK AT+MSMPD? +MSMPD: 0 OK

4.2.3 +CPWROFF Switch off MS

This command allows to switches off the Modem (shutdown the system).

Command	Description
Set	<p>[Function] This command allows to switches off the Modem (shutdown the system).</p> <p>[Syntax] AT+CPWROFF</p> <p>[Response/Action] OK or +CME ERROR: <error></p>
Read	N/A
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+CPWROFF=?</p> <p>[Response/Action] OK</p>
Parameters	N/A

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Command	Description
Example	AT+CPWROFF=? OK AT+CPWROFF OK

4.2.4 +MTSM, Temperature Sensor Measurement

This command measures the current temperature sensor value in Celsius degrees.

This temperature is taken from a thermistor internally.

All the parameters restore to default values when Modem restart.

All the parameter default value is 0.

Command	Description
Set	<p>[Function] Read the temperature.</p> <p>[Syntax] AT+MTSM=<Report>[,<Rate>][,<Low>,<High>]</p> <p>[Response/Action]</p> <p>For <Report>=0 OK</p> <p>For <Report>=1 +MTSM: <Temp> OK</p> <p>For <Report>=2 or 3 OK +MTSM: <Temp> ... +MTSM: <Temp></p> <p>or: ERROR: <error code></p>

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Command	Description
Read	<p>[Function] Read the temperature.</p> <p>[Syntax] AT+MTSM?</p> <p>[Response/Action] +MTSM=<Report>[,<Rate>][,<Low>,<High>] OK</p>
Test	<p>[Function]</p> <p>[Syntax] AT+MTSM=?</p> <p>[Response/Action] +MTSM: (range of <Report>),(range of <Rate>),(range of <Low>/<High>) OK</p>
Parameters	<p><Temp> -40 - 125; Temperature measurements in Celsius degrees.</p> <p><Report></p> <ul style="list-style-type: none"> 0: Deactivate unsolicited report. 1: Report once the current temperature. 2: Activate unsolicited report. 3: Activate unsolicited report only for out-off boundaries events. 6: Report the temperature of BBIC 7: Report the temperature of RF <p><Rate> 1-255; Select the time interval in seconds between the unsolicited reports. (Default value = 1 Second).</p> <p><Low> (-)-0 - 125; The lowest boundary level of the temperature value for unsolicited report. (Default value = 0 Celsius).</p> <p>Setting corresponding <Low> and <High> temperature boundaries for <Report>=3 only.</p>

Command	Description
	<p><High> (-)-0 - 125; The Highest boundary level of the temperature value for unsolicited report. (Default value = 0 Celsius). Setting corresponding <Low> and <High> temperature boundaries for <Report>=3 only.</p>
<p>Example</p>	<pre> AT+MTSM=? // Test the range of the parameters. +MTSM: (0-3,6-7),(1-255),(-40-125) OK AT+MTSM=1 // Set to read for once the current temperature measurement. +MTSM: 35 // Current temperature is +35 Celsius degree. OK AT+MTSM=2,5 // Set to unsolicited temperature reports to TE for every 5 seconds. OK +MTSM: -10 // Current temperature measure report -10 Celsius. +MTSM: -5 // Unsolicited temperature report -5 Celsius after 5 seconds. +MTSM: 7 // Unsolicited temperature measure report +7 Celsius after 10 seconds. +MTSM: 20 // Unsolicited temperature measure report +20 Celsius after 15 seconds. ... +MTSM: 50 // Unsolicited temperature measure report +50 Celsius after Nx5 seconds. AT+MTSM=0 // Set to stop the unsolicited report. OK AT+MTSM=3,30,-10,40 // Set to out-off boundary (-10 to +40 Celsius) unsolicited reports for every 30 seconds. OK +MTSM: -20 // Unsolicited current report out-off the Low boundary. +MTSM: -12 // Unsolicited report out-off the Low boundary after 30 seconds. +MTSM: 47 // Unsolicited report out-off the High boundary after Nx30 seconds AT+MTSM? // Read the current setting. +MTSM: 3,30,-10,40 </pre>

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Command	Description
	OK
	AT+MTSM=0 // Set to stop the unsolicited report.
	OK
	AT+MTSM? // Read the current setting.
	+MTSM: 0
	OK

4.2.5 +GTWAKE, Open or close wake host

This command is used to set wake up host function to on or off.

PIN WAKEUP_HOST is used to wake up host, The default is High voltage (1.8V). When the wake up host function is enabled, if there is incoming voice call, SMS, or data packet, the PIN WAKEUP_HOST will output 1s low voltage pulse.


Command	Description
Set	<p>[Function] This command is used to set wake up host function.</p> <p>[Syntax] AT+GTWAKE=<mode></p> <p>[Response/Action] OK or ERROR</p>
Read	<p>[Function] This command returns the current status.</p> <p>[Syntax] AT+GTWAKE?</p> <p>[Response/Action] +GTWAKE: <mode> OK</p>

Command	Description
Test	<p>[Function] This command returns the supported values.</p> <p>[Syntax] AT+GTWAKE=?</p> <p>[Response/Action] +GTWAKE: (0,1) OK</p>
Parameters	<p><mode></p> <p>0 :wake host is disable. 1 :wake host is enable.</p>
Example	<pre>AT+GTWAKE=1 OK AT+GTWAKE? +GTWAKE: 1 OK AT+GTWAKE=? +GTWAKE: (0,1) OK</pre>

4.2.6 +MSTART, Start message notification

This command can Enable/Disable the module output start message when power up.

Command	Description
Set	<p>[Function] This command is used to set the start message when power up.</p> <p>[Syntax] AT+MSTART=<at start>,<sim ready></p> <p>[Response/Action] OK or ERROR</p>
Read	<p>[Function] This command returns the current status.</p>

Command	Description
	<p>[Syntax] AT+MSTART?</p> <p>[Response/Action] +MSTART: <at start>,<sim ready></p> <p>OK</p>
Test	<p>[Function] This command returns the supported values.</p> <p>[Syntax] AT+MSTART=?</p> <p>[Response/Action] +MSTART: ((list of supported <at start>),(list of supported <sim read>))</p> <p>OK</p>
Parameters	<p><at start></p> <p>0: Do not output “AT command ready” from UART</p> <p>1: Output “AT command ready” from UART (default value)</p> <p><sim ready></p> <p>0: Do not output “+SIM READY” after SIM init OK</p> <p>1: Output “+SIM READY” after SIM init OK (default value)</p> <p> Notes: “AT command ready” can not output from USB port even if set to 1. “+SIM READY” can output from UART and USB port according to setting.</p>
Example	<p>AT+MSTART=?</p> <p>+MSTART: (0-1,0-1)</p> <p>OK</p> <p>AT+MSTART=1,1</p> <p>OK</p> <p>AT+MSTART?</p> <p>+MSTART: 1,1</p> <p>OK</p>

4.2.7 +GFSN, Set SN Number

This command is used to set SN number.

Command	Description
Set	<p>[Function] The Set command is used to set SN number.</p> <p>[Syntax] AT+GFSN=<g_fsn></p> <p>[Response/Action] OK or: ERROR</p>
Read	N/A
Test	N/A
Parameters	<g_fsn> string type, the maximum length is 12 character. The parameter is kept after power-cycle and software update.
Example	AT+GFSN="1234567890" OK

4.3 Multiplexer Feature

The MUX provides multiple logical communication channels between the DTE and Modem over one physical RS232 or USB connection. This service enables the DTE device to run multiple applications (such as GPRS, CSD, SMS and voice calls) while communicating simultaneously with the Modem.

The Modem can support the multiplexing protocol control channel as defined in GSM07.10 and only basic mode.

4.3.1 +CMUX, MUX Start up Command

This command is used to start the GSM MUX multiplexing protocol stack. When the Modem received a valid +CMUX command, it returns OK and changes its state to MUX-Init. If the parameters are left out, the default value is used.

Command	Description
Set	<p>[Function] The Set command requests the Modem to open the MUX stack with various</p>

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Command	Description
	<p>parameters. This command works only in PREMUX state.</p> <p>[Syntax] +CMUX=<mode>[,<subset>[,< port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]]]</p> <p>[Response/Action] OK or +CME ERROR: <err></p>
Read	<p>[Function] The Read command displays the current mode and settings. This command works only in MUX state.</p> <p>[Syntax] +CMUX?</p> <p>[Response/Action] +CMUX: <mode>, [<subset>], <port_speed>, <N1>, <T1>, <N2>, <T2>, <T3>, <K> OK or +CME ERROR: <err></p>
Test	<p>[Function] The Test Command displays a list of supported modes and parameters. This command works in both PREMUX and MUX states.</p> <p>[Syntax] +CMUX=?</p> <p>[Response/Action] +CMUX: (list of supported <mode>s),(list of supported<subset>s),[(list of supported <port_speed>s)],(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s),(list of supported <k>s)</p>

Command	Description
Parameters	<p><mode> MUX mode:</p> <p>0 Basic</p> <p><subset> Defines how the MUX control channel is set up. The virtual channel is set up according to this setting.</p> <p>0 UIH frames used only</p> <p><port_speed></p> <p>1 9600 bit/sec</p> <p>2 19200 bit/sec</p> <p>3 38400 bit/sec</p> <p>4 57600 bit/sec</p> <p>5 115200 bit/sec(default)</p> <p>6 230400 bit/sec</p> <p>7 1 M bit/s</p> <p><N1> Maximum frame size: 1—1509; The default value is 31 in Basic mode.</p> <p><T1> Acknowledgement timer (in units of 10 ms). 1-255 The default value is 10 (100 ms)</p> <p><N2> Maximum number of re-transmissions. 0-5 The default value is 3.</p> <p><T2> Response timer for the DLC0 (in unit of 10 ms). <T2> must be longer than <T1>. 2-255 The default value is 30 (300 ms).</p> <p><T3> Wake up response timer (in seconds). 1-255 The default value is 10.</p> <p><k> Reserve for Advanced operation with Error Recovery options.</p>
Example	<pre>T+CMUX=? +CMUX: (0),(0),,(1-1509),(1-255),(0-5),(2-255),, OK AT+CMUX? +CMUX: 0,0,,0,0,0,0,0,0 OK</pre>

Command	Description
Reference	3GPP TS 27.007

4.4 Error Handling Commands

4.4.1 +CMEE, Report Mobile Equipment Error

The Set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the MODEM. When enabled, Modem -related errors cause a +CME ERROR: <err> final result code instead of the regular ERROR final result code. Usually, ERROR is returned when the error is related to syntax, invalid parameters or terminal functionality.

For all Accessory AT commands besides SMS commands, the +CMEE set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the Modem. When enabled, Modem related errors cause a +CME ERROR: <err> final result code instead of the regular ERROR result code.

For all SMS AT commands that are derived from GSM 07.05, the +CMEE Set command disables or enables the use of result code +CMS ERROR: <err> as an indication of an error relating to the functionality of the modem. When enabled, modem -related errors cause a +CMS ERROR: <err> final result code instead of the regular ERROR final result.

Command	Description
Set	<p>[Function] The Set command enables or disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the Modem.</p> <p>[Syntax] AT+CMEE=[<n>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command returns the current setting format of the result code.</p> <p>[Syntax] AT+CMEE?</p>

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Command	Description
	<p>[Response/Action] +CMEE: <n> OK</p>
Test	<p>[Function] The Test command returns values supported by the terminal as a compound value.</p> <p>[Syntax] AT+CMEE=?</p> <p>[Response/Action] +CMEE: (list of supported <n>s) OK</p>
Parameters	<p><n></p> <p>0 Disable the +CME ERROR: <err> result code and use ERROR.</p> <p>1 Enable the +CME ERROR: <err> or +CMS ERROR: <err> result codes and use numeric <err> values or +STK ERROR: <err> result codes and use numeric <err> values.</p> <p>2 Enable the +CME ERROR: <err> or +CMS ERROR: <err> result codes and use verbose <err> values or +STK ERROR: <err> result codes and use numeric <err> values.</p> <p>The default value is 0.</p>
Example	<pre> AT+CMEE=0 //+CME ERROR is not used OK AT+VTD ERROR AT+CMEE=1 //Use numeric <err> OK AT+VTD +CME ERROR: 1 AT+CMEE=2 //Use verbose <err> OK AT+VTD +CME ERROR: operation not supported </pre>

Command	Description
Reference	3GPP TS 27.007

4.4.2 +CEER, Extended Error Report

This execution command returns an extended error report containing one or more lines of information text <report>, determined by the manufacturer, providing reasons for the following errors:

- ◆ Failure in the last unsuccessful call setup (originating or answering) or the in-call modification.
- ◆ Last call release.

Typically, the text consists of a single line containing the reason for the error according to information given by GSM network, in textual format.

Command	Description
Set	<p>[Function] This command returns an extended error report.</p> <p>[Syntax] AT+CEER</p> <p>[Response/Action] +CEER: <category>[,<cause>,<description>] OK</p>
Read	N/A
Test	<p>[Function] This command just reply with an OK status, has no real meaning.</p> <p>[Syntax] AT+CEER=?</p> <p>[Response/Action] OK</p>
Parameters	<p><category></p> <p>“No report available”</p> <p>“CC setup error”</p> <p>“CC modification error”</p> <p>“CC release”</p> <p>“SM attach error”</p> <p>“SM detach”</p>


Command	Description
	<p>“SM activation error”</p> <p>“SM deactivation”</p> <p>“SS – network error cause”</p> <p>“SS – network reject cause”</p> <p>“SS – network GSM cause”</p> <p><cause> contains a digit representing the error cause sent by network or internally</p> <p><description> Is a verbose string containing the textual representation of the Cause</p>
Example	<pre>AT+CEER +CEER: "No report available" OK AT+CEER=? OK</pre>
Reference	3GPP TS 27.007



5 Clock

5.1 System Date and Time Access Commands

5.1.1 +CCLK, Read/Set System Date and Time

This command reads and sets the Modem current date, time and time zone.

Command	Description
Set	<p>[Function]</p> <p>The Set command sets the date, time and time zone of the system clock.</p> <p> Note: Set Command sets user defined system clock values and saves the time and date in the NVM memory. These saved values are kept after power-cycle as well.</p> <p>[Syntax]</p> <pre>AT+CCLK=<time></pre>

Command	Description
	<p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The Read command returns the current date, time and time zone setting.</p> <p>By default, <time> will represent the network updated time.</p> <p>If the user has used the Set command once, then <time> will represent the Set command setting.</p> <p> Note:</p> <p>If network operator does not support System Clock Update Message, the initial date, time and time zone, displayed by CCLK Read Command could be invalid (user's responsibility to set date, time and time zone by CCLK Set Command).</p> <p> Note:</p> <p>See Execute Command for how-to enable back network update time.</p> <p>[Syntax]</p> <p>AT+CCLK?</p> <p>[Response/Action]</p> <p>+CCLK: <time></p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Test	<p>[Function]</p> <p>The Test command returns valid parameters for the +CCLK Set command.</p> <p>[Syntax]</p> <p>AT+CCLK=?</p> <p>[Response/Action]</p>

Command	Description
	+CCLK (list of supported <time>s) OK
Parameters	<time> ASCII string of format: yy/MM/dd,hh: mm: ss±zz or yy/MM/dd,hh: mm: ss or yy/MM/dd,hh: mm yy - 2-digit year [2000-2069] MM - 2-digit month [01-12] dd - 2-digit day of month [00-31] hh - 2-digit hour [00-23] mm - 2-digit minute [00-59] ss - 2-digit seconds [00-59] zz - (optional) time zone offset from GMT, in quarter-hours [-47...+48]. If this value is not specified, the time zone offset will be 0.
Example	AT+CCLK=? OK AT+CCLK="01/01/01,01:01:01-08" OK AT+CCLK? +CCLK: "01/01/01,01:01:01-08" OK
Reference	3GPP TS 27.007

5.1.2 +CTZU, Automatic Time Zone Update

This command enables/disables (on/off) the automatic update of the time zone via NITZ.

Command	Description
Set	[Function] Execution command enables/disables the automatic update of the time zone. [Syntax] AT+CTZU=<on off>

Command	Description
	<p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Read command returns the state of the automatic update (enable/disable) (on/off).</p> <p>[Syntax] AT+CTZU?</p> <p>[Response/Action] +CTZU: <on off> OK</p>
Test	<p>[Function] Test command returns list of the supported (on/off)s.</p> <p>[Syntax] AT+CTZU=?</p> <p>[Response/Action] +CTZU: (list of supported <on off>s) OK</p>
Parameters	<p><on off> integer type value indicating: 0 Disable automatic time zone update via NITZ 1 Enable automatic time zone update via NITZ.(default)</p>
Example	<p>AT+CTZU=? +CTZU: (0,1) OK AT+CTZU? +CTZU: 1 OK</p>

Command	Description
	AT+CTZU=0 OK AT+CTZU? +CTZU: 0 OK
Reference	3GPP TS 27.007

5.1.3 +CTZR, Time Zone Reporting

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

Command	Description
Set	<p>[Function] This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>, +CTZE: <tz>,<dst>,[<time>], or +CTZEU: <tz>,<dst>,[<utime>] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network.</p> <p>[Syntax] AT+ CTZR = <reporting></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Read command returns the status of the time zone change event reporting (enable/disable) (on/off).</p> <p>[Syntax] AT+ CTZR?</p> <p>[Response/Action] +CTZR: < reporting ></p>

Command	Description
	OK
Test	<p>[Function] Test command returns list of the supported (on/off)s. If the reporting is enabled, the MT returns the URC whenever the time zone is changed.</p> <p>[Syntax] AT+ CTZR=?</p> <p>[Response/Action] +CTZR: (list of supported < reporting >s) OK</p>
Parameters	<p>< reporting > integer type value indicating: 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 and local time reporting by unsolicited result code +CTZE: <tz>,<dst>,[<time>]. 3 Enable extended time zone and universal time reporting by unsolicited result code +CTZEU: <tz>,<dst>,[<utime>]. Note: <reporting>=3 is supported only when CAT_R13_SUPPORT is enabled in the build config.</p> <p><tz> integer value indicating the time zone.</p> <p><time> string type value; format is "Yy/MM/dd,hh:mms" ,wherein characters indicates year, month, day, hour, minutes, seconds.</p> <p><dst> daylight savings time value: 0 No adjustment for Daylight Saving Time 1 +1 hour adjustment for Daylight Saving Time 2 +2 hours adjustment for Daylight Saving Time</p> <p><timezone> string type value representing the sum of the local time zone (difference between the</p>

Command	Description
	<p>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".</p> <p><timzone_variance></p> <p>is a string "GMT+HH:MM" or "GMT-HH:MM" e.g. "GMT+5:30"</p> <p><utime></p> <p>String type value representing the universal time; format is "YYYY/MM/DD,hh:mm:ss", wherein characters indicates year, month, day, hour, minutes, seconds.</p>
Example	<pre>AT+CTZR=? +CTZR: (0-3) OK AT+CTZR? +CTZR: 0 OK AT+CTZR=1 OK</pre>
Reference	3GPP TS 27.007

6 SMS

6.1 SMS Commands

Modem supports SMS PDU and SMS TEXT mode according to ETSI specifications 3GPP TS 27.005 & 3GPP TS 03.40/23.0400.

6.1.1 +CSMS, Select Message Service

This command handles the selection of the messaging service. It returns the types of messages that are supported by the Modem.

Command	Description
Set	<p>[Function] The Set command sets the type of service and returns the types of messages supported by the Modem.</p> <p>[Syntax] AT+CSMS=<service></p> <p>[Response/Action] +CSMS: <mt>,<mo>,<bm> OK or: +CMS ERROR: <err></p>
Read	<p>[Function] The Read command returns the supported message types along with the current service setting.</p> <p>[Syntax] AT+CSMS?</p> <p>[Response/Action] +CSMS: <service>,<mt>,<mo>,<bm> OK</p>
Test	<p>[Function] The Test command returns a list of all the services supported by the terminal.</p> <p>[Syntax] AT+CSMS=?</p> <p>[Response/Action] +CSMS: <service> OK</p>


Command	Description
Parameters	<p><service> Integer that defines the type of service</p> <p>0:SMS AT command grammar is compatible with GSM Phase 2</p> <p>1:SMS AT command grammar is compatible with GSM Phase 2+</p> <p><mt> Mobile terminated messages</p> <p>0 Not supported by the Modem</p> <p>1 Supported by the Modem</p> <p><mo> Mobile originated messages</p> <p>0 Not supported by the Modem</p> <p>1 Supported by the Modem</p> <p><bm> Broadcast type messages</p> <p>0 Not supported by the Modem</p> <p>1 Supported by the Modem</p>
Example	<pre>AT+CSMS? +CSMS: 1,1,1,1 OK</pre>
Reference	3GPP TS 27.005

6.1.2 +CPMS, Preferred Message Storage

This command handles the selection of the preferred message storage area. The message storage area is divided into three parts, mem1, mem2 and mem3.

Command	Description
Set	<p>[Function]</p> <p>The Set command sets the memory storage.</p> <p>[Syntax]</p> <pre>AT+CPMS=<mem1>[,<mem2>[,<mem3>]]</pre> <p>[Response/Action]</p> <pre>+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3></pre> <p>OK</p> <p>or:</p>

Command	Description
	<p>+CMS ERROR: <err></p>
<p>Read</p>	<p>[Function] The Read command displays the selected memory storage type for the three memory areas.</p> <p>[Syntax] AT+CPMS?</p> <p>[Response/Action] +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK or: +CMS ERROR: <err></p>
<p>Test</p>	<p>[Function] The Test command lists the supported memory storage for <mem1>, <mem2> and <mem3></p> <p>[Syntax] AT+CPMS=?</p> <p>[Response/Action] +CPMS: (list of supported<mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK or: +CMS ERROR: <err></p>

Command	Description
Parameters	<p><mem1>Memory from which messages are read and deleted. Supported values are: "SM", "BM", "ME", "SR". The default value at power-up is "SM".</p> <p><mem2>Memory to which writing operation is made. Supported value is: "SM". The default value at power-up is "SM".</p> <p><mem3>Memory to which received SMS are stored (unless forwarded directly to TE). Supported value is: "SM", "BM", "SR" The default value at power-up is "SM".</p> <p>"BM" Broadcast message storage "SM" (U)SIM message storage "ME" ME message storage "SR" status report storage</p> <p> Note: L8 family products support only "SM" storage for all areas.</p>
Example	<pre>AT+CPMS="SM" +CPMS: 5,50,5,50,5,50 OK AT+CPMS? +CPMS: "SM",5,50,"SM",5,50,"SM",5,50 OK</pre>
Reference	3GPP TS 27.005

6.1.3 +CMGF, Message Format

This command is a basic command.

The Set command handles the selection of the message format used with send, list, read and write commands, as well as the format of unsolicited result codes resulting from message receipts.

The Modem supports both PDU mode (where entire TP data units are used) and text mode (where the body of the message and its headers are given as separate parameters).

Command	Description
Set	<p>[Function] The Set command sets the message format to use.</p> <p>[Syntax] AT+CMGF=<mode></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command displays the current message format.</p> <p>[Syntax] AT+CMGF?</p> <p>[Response/Action] +CMGF: <mode> OK</p>
Test	<p>[Function] The Test command lists all the supported message formats.</p> <p>[Syntax] AT+CMGF=?</p> <p>[Response/Action] +CMGF: (list of supported mode>s) OK</p>
Parameters	<p><mode> Message format:</p> <ul style="list-style-type: none"> 0 PDU mode (default) 1 Text mode

Command	Description
Example	AT+CMGF=1 OK AT+CMGF? +CMGF: 1 OK AT+CMGF=? +CMGF: (0,1) OK
Reference	3GPP TS 27.005

6.1.4 +CSCA, Service Center Address

This command enables to write/read SCA to/from SIM. In SMS text mode, SCA stored in SIM is added to any stored and sent SMS. In SMS pdu mode, SCA stored in SIM is added to stored SMS and send SMS only when SCA address length coded in PDU equals zero.

Command	Description
Set	<p>[Function] Sets service center address stored in SIM (EF-SMSp -Short message service parameters). <tosca> is optional parameter, When <sca> is prefixed with '+' it indicates that <tosca> is set to 145(International number), otherwise is 129(local number).</p> <p>[Syntax] AT+CSCA=<sca>[,<tosca>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Read command displays <sca> and <tosca> stored in SIM*EF-SMSp).</p> <p>[Syntax] AT+CSCA?</p>

Command	Description
	<p>[Response/Action]</p> <p>AT+CSCA: <sca>,<tosca></p> <p>OK</p>
Test	<p>[Function]</p> <p>Test command only returns OK.</p> <p>[Syntax]</p> <p>AT+CSCA=?</p> <p>[Response/Action]</p> <p>OK</p>
Parameters	<p><sca> Service Center Address</p> <p>"+" character prefix of <sca> indicates <tosca> of 145.</p> <p>Minimum 1 and up to 20 characters, where each character is represented by semi octets (excluding '+' character).</p> <p>If <sca> contains an odd number of digits, bits 4 to 7 of the last octet shall be filled with an end mark coded "1111".</p> <p><tosca> Type of service center address.</p> <p><tosca> of 129 is mostly use for local number and 145 for International.</p> <p><tosca> of 129 is default value.</p> <p><tosca> values are in range of 0-255.</p> <p>Valid values are defined according to:</p> <p>GSM03.40 v7.4.0 section 9.1.2.5 as follow:</p> <p>Bit 7 is 1</p> <p>Bits 6,5-4 - Present Type of number as follow:</p> <p>Bits 6 5 4</p> <p>0 0 0 Unknown</p> <p>0 0 1 International number</p> <p>0 1 0 National number</p> <p>0 1 1 Network specific number</p> <p>1 0 0 Subscriber number</p> <p>1 0 1 Alphanumeric, (coded according to GSM TS 03.38 7-bit default alphabet)</p>

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Command	Description
	1 1 0 Abbreviated number 1 1 1 Reserved for extension Numbering-plan-identification (applies for Type-of-number = 000,001,010) Bits 3 2 1 0 0 0 0 0 Unknown 0 0 0 1 ISDN/telephone numbering plan (E.164/E.163) 0 0 1 1 Data numbering plan (X.121) 0 1 0 0 Telex numbering plan 1 0 0 0 National numbering plan 1 0 0 1 Private numbering plan 1 0 1 0 ERMES numbering plan (ETSI DE/PS 3 01-3) 1 1 1 1 Reserved for extension. All other values are reserved.
Example	<pre> AT+CSCA? +CSCA: "+97212356",145 // Read SCA address and TOSCA stored in SIM (EF-smsp) OK AT+CSCA="97212356" OK AT+CSCA? +CSCA: "97212356",129 OK </pre>
Reference	3GPP TS 27.005

Following table describes +CSCA <SCA> valid parameters including the conversion when using stored <SCA> in SMS PDU mode (editing SMS via +CMGW or +CMGS without SCA). This is according to 24.008V031000P Table 10.5.118/GSM 24.008V031000P: Called party BCD number:


<SCA> Character in SMS (Text mode)	Mapped character for SMS PDU mode
Digits: 0-9	Digits: 0-9

<SCA> Character in SMS (Text mode)	Mapped character for SMS PDU mode
'+'	0x91
'**'	'A'
'#'	'B'
'A'	'C'
'B'	'D'
'C'	'E'

6.1.5 +CSMP, Set Text Mode Parameters

This command is a basic command and is used to select values for additional parameters needed when SMS is sent to the network or placed in storage when TEXT mode is selected.

Command	Description
Set	<p>[Function] The set command selects values for additional parameters needed when SMS is sent to the network or placed in storage when text format message mode is selected.</p> <p>[Syntax] AT+CSMP=[<fo>[,<vp>[,<pid>[,<dc>]]]]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The read command returns the current parameters value.</p> <p>[Syntax] AT+CSMP?</p> <p>[Response/Action] +CSMP: <fo>,<vp>,<pid>,<dc> OK</p>
Test	<p>[Function] The test command just returns OK.</p>

Command	Description
	<p>[Syntax] AT+CSMP=?</p> <p>[Response/Action] OK</p>
Parameters	<p><fo> Depending on the command or result code: first octet of 3GPP TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT(default 17), SMS-STATUS-REPORT, or SMS-COMMAND(default 2) in integer format.</p> <p><vp> Validity Period, depending on SMS-SUBMIT <fo>, TP-Validity-Period-Format bits setting.</p> <p>If there is no correlation between the VPF and the VP value. an error message will be returned.</p> <p>Either in integer format (see Table) or in time-string format ("yy/MM/dd, hh:mm:ss±zz"). If in integer format the vp will write to SIM EF and read from SIM EF when use it.</p> <p><pid> Protocol-Identifier. The one octet information element by which the SM-TL either refers to the higher layer protocol being used, or indicates interworking with a certain type of telematic device.</p> <p>"0 - no interworking, SME-to-SME protocol (default) "Any value between 0-255 will be accepted.</p> <p>The SC may reject messages with a TP-Protocol-Identifier containing a reserved value or one, which is not supported.</p> <p><dc> One octet of Data Coding Scheme, indicates the data coding scheme of the DATA, and may indicate a message class.</p> <p> Note: For DCS expanded information, see section "DCS handling".</p> <p>default alphabet: 00xx00xx, 111 100xx, 1 101xxxx</p> <p>8 bit data: 00xx01xx, 111101xx</p> <p>UCS2: 00xx10xx, 1110xxxx</p> <p>reserved: 00xx11xx, 0100xxxx-1011xxxx</p> <p>The default value at power-up is 0 - Default alphabet.</p>
Example	<p>AT+CSMP?</p> <p>+CSMP: 17,167,0,0 (default values for SMS-SUBMIT)</p>

Command	Description
	OK AT+CSMP= 1,256,0,0 +CMS ERROR: operation not supported AT+CSMP=? OK AT+CSDH=1 OK AT+CMGF=1 OK AT+CMGW="15820447141" > ABC(^Z) +CMGW: 6 OK AT+CMGR=6 +CMGR: "STO UNSENT","15820447141",",",129,17,0,0,167,"+8613800755500",145,3 ABC OK
Reference	3GPP TS 27.005

The following table shows the VP format.

<Parameter>	Description
0 to 143	(TP-VP + 1) x 5 minutes (i.e. 5 minutes intervals up to 12 hours)
144 to 167	12 hours + ((TP-VP - 143) x 30 minutes)
168 to 196	(TP-VP - 166) x 1 day
197 to 255	(TP-VP - 192) x 1 week

6.1.6 +CSDH, Show Text Mode Parameters

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

Command	Description
Set	[Function] The set command controls whether detailed header information is shown in text mode

Command	Description
	<p>result codes.</p> <p>[Syntax] AT+CSDH=[<show>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The read command returns the current <show> parameter value.</p> <p>[Syntax] AT+CSDH?</p> <p>[Response/Action] +CSDH: (<show>) OK</p>
Test	<p>[Function] This command returns the list of supported values.</p> <p>[Syntax] AT+CSDH=?</p> <p>[Response/Action] +CSDH: (list of supported <show>s) OK</p>
Parameters	<p><show></p> <p>0 - Means 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 SMS- DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>,<mn>, <da>, <toda>, <length> or <cdata> (default).</p> <p>1 - Means show the values in result codes.</p>
Example	<p>AT+CSDH=? +CSDH: (0,1) OK AT+CSDH? +CSDH: 0</p>

Command	Description
	OK AT+CMGR=160// SMS-SUBMIT +CMGR: "STO UNSENT","0544565034", ABC OK AT+CSDH=1 OK AT+CMGR=160 +CMGR: "STO UNSENT","0544565034",,81,29,0,0,"04/11/04,09: 48: 36+08", "+97254120032",145,3 ABC OK
Reference	3GPP TS 27.005

6.1.7 +CNMI, New Message Indications to Terminal

This command handles enabling of unsolicited notifications to the terminal when an SMS is received by the Modem.

After sending an unsolicited response to the TE, the Modem will expect a +CNMA (new message acknowledgement) from the TE within a predefined timeout of 15 seconds. Within the timeout the Modem will not send another unsolicited response to the TE before the previous one is acknowledgement. If the Modem does not receive acknowledgment within the required time, CNMI parameters will NOT be reset automatically and the unsolicited response will send to the TE again.

Command	Description
Set	<p>[Function]</p> <p>This command handles enabling of unsolicited notifications to the terminal when an SMS is received by the Modem.</p> <p>[Syntax]</p> <p>AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]</p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	[Function]

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Command	Description
	<p>This command returns the current values.</p> <p>[Syntax] AT+CNMI?</p> <p>[Response/Action] +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK</p>
Test	<p>[Function] This command returns the list of supported values.</p> <p>[Syntax] AT+CNMI=?</p> <p>[Response/Action] +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) OK</p>
Parameters	<p><mode></p> <ul style="list-style-type: none"> 0 Buffer unsolicited result codes in the TA; if the TA buffer is full, the oldest indication may be discarded and replaced with the new received indications (ring buffer). 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved; otherwise forward them directly to the terminal. 2 Buffer unsolicited result codes in the TA when the serial link is busy (e.g. data-transfer); otherwise forward them directly to the terminal. <p><mt></p> <ul style="list-style-type: none"> 0 No SMS-DELIVER indications are routed to the terminal (default) 1 If SMS-DELIVER is stored in the Modem, the memory location indication is routed to the terminal using the unsolicited result code: +CMTI: <mem>,<index> 2 SMS-DELIVER (except class2 SMS) are routed directly to the TE using the unsolicited result code: <p>+CMT: [<alpha>,<length><CR><LF><pdu> (in PDU mode)</p>

Command	Description
	<p>or</p> <p>+CMT:</p> <p><oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF></p> <p>If ME has its own display device then class 0 SMS and SMS in the message waiting indication group (discard message) may be copied to both ME display and to terminal. In this case ME shall send the acknowledgement to the network. Class 2 SMSs and messages in the message waiting indication group (storage message) result in indication as defined in <mt>=1</p> <p>3 Class 3 SMS-DELIVERs are routed directly to terminal using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.</p> <p><bm></p> <p>0 No CBM indications are routed to the terminal (default)</p> <p>1 if CBM is stored in RAM/NVRAM by ATC/DR, an indication of memory location is routed to DTE unsolicited result code +CBMI: <mem>,<index></p> <p>2 new CBMs are routed directly to the terminal using unsolicited result code: +CBM: <length><CR><LF><pdu (when PDU-mode enabled) or +CBM: <sn>,<mid>,<dcsc>,<page>,<pages><CR><LF><data></p> <p>3 Class 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.</p> <p><ds></p> <p>0 No SMS-STATUS-REPORT indications are routed to the terminal (default)</p> <p>1 SMS-STATUS-REPORT is routed directly to the terminal</p> <p>2 If SMS-STATUS-REPORT is stored in the Modem, the memory location indication is routed to the terminal using the unsolicited result code: +CDSI: <mem>,<index></p> <p><bfr></p> <p>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).</p> <p>1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1..3 is entered.</p>

Command	Description
Example	<pre> AT+CMGF=1 OK AT+CNMI=? +CNMI: (0-2),(0-3),(0-3),(0-2),(0,1) OK AT+CNMI? +CNMI: 0,0,0,0 OK AT+CNMI=2,1 OK AT+CMSS=142,"0544565034" // send to myself +CMSS: 72 OK +CMTI: "SM",15 AT+CNMI=1,2 OK AT+CSDH=1 OK AT+CMSS=142,"054565034" // send to myself +CMSS: 73 OK +CMT: "+972544565034",,"04/11/04,09: 48: 36+08",145,4,0,0,"+97254120032",145,3 ABC AT+CSMP=49,167 //Set first octet to status report. // See status report parameters in CMGW. OK AT+CSMP? +CSMP: 49,167,0,0 OK AT+CNMI=1,,1 OK AT+CNMI? +CNMI: 1,0,0,1,0 </pre>

Command	Description
	OK AT+CNMI=1,0,0,1,0 OK AT+CMGS="0524680592" > HELLO +CMGS: 168 OK +CDS: 6,168,"+972524680592",145,"05/08/02,15: 20: 12+08","05/08/02,15: 20: 14+08",0 AT+CNMI=1,0,0,2 OK AT+CMSS=296 +CMSS: 185 OK +CDSI: "SM",6
Reference	3GPP TS 27.005

6.1.8 +CNMA, New Message Acknowledgment

This command acknowledges the receipt of a +CMT and +CDS response from the terminal to the Modem. A +CMT response receipt confirms the correct reception of a new SMS-DELIVER message, which was routed directly to the terminal. A +CDS response receipt confirms the correct reception of a new SMS-STATUS-REPORT message, which was routed directly to the terminal.

When the Modem sends a +CDS response to the terminal, it waits a predefined timeout of 15 seconds for the +CNMA acknowledgment. The Modem will not send another +CDS result code to the terminal before the previous one is acknowledged, or the timeout expires.

When the Modem sends a +CMT response to the terminal, it waits a predefined timeout of 15 seconds for the +CNMA acknowledgment. The Modem will not send another +CMT result code to the terminal before the previous one is acknowledged, or the timeout expires. Upon receipt of the +CNMA command, the Modem sends RP-ACK to the network. The acknowledged SMS will not be saved in message storage. If the command is executed but no acknowledgment is expected, or some other Modem related error occurs, the final result code +CMS ERROR: <err> is returned.



Note:

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AT+CNMA send acknowledgment to network , Two conditions must be met AT+CSMS=1 command set <service> to 1, AT+CNMI=,2 command set <mt> to 2 or AT+CNMI=,1 command set <ds> to 1. After the two conditions are met, If the Modem does not receive acknowledgment after receiver a SMS within the required time, CNMI parameters will NOT be reset automatically and the +CMT or +CDS unsolicited response will send to the TE again.

Command	Description
Set	<p>[Function] This command acknowledge the receipt of a +CMT and +CDS response from the terminal to the Modem.</p> <p>[Syntax] For text mode (+CMGF=1) AT+CNMA For PDU mode (+CMGF=0) AT+CNMA[=<n>[,<length>[<CR>PDU<ctrl-Z/ESC>]]]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	N/A
Test	<p>[Function] This command returns the list of supported values.</p> <p>[Syntax] AT+CNMA=?</p> <p>[Response/Action] OK in text mode or: +CNMA: (list of supported <n>s) in PDU mode</p>
Parameters	<p><n></p> <p>0 command operates similarly as defined for the text mode</p> <p>1 send RP-ACK</p> <p>2 send RP-ERROR</p>

Command	Description
	<length> Length of the PDU in PDU mode
Example	<pre> AT+CNMI=2,2 OK AT+CMSS=142,"054565132" // send to myself +CMSS: 74 OK +CMT: "+97254565132",,"03/04/09,17: 14: 33+08" new message text AT+CNMA OK AT+CNMI? +CNMI: 2,2,0,0 OK AT+CNMI=1,0,0,1 OK AT+CSMP=49,167 OK AT+CSMP? +CSMP: 49,167,0,0 OK AT+CNMI? +CNMI: 1,0,0,1,0 OK AT+CMSS=295 +CMSS: 184 OK +CDS: 6,184,"+972524680592",145,"05/08/02,17: 19: 23+08","05/08/02,17: 19: 24+08",0 AT+CNMA OK AT+CNMI? +CNMI: 1,0,0,1,0 OK </pre>
Reference	3GPP TS 27.005

6.1.9 +CMTI, Unsolicited Response (New SMS-DELIVER Receipt Indication)

The +CMTI unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SMS, if the +CNMI parameter <mt> is set to 1. Refer to “+CNMI, New Message Indications to Terminal”.

This unsolicited message indicates that a new SMS-DELIVER message was received, and is stored in location <index>:

+CMTI: <mem>,<index>

Command	Description
Set	N/A
Read	N/A
Test	N/A
Parameters	<mem> Message memory space. "SM" - SIM memory storage. <index> Location of the new message.
Example	AT+CMGF=0 OK AT+CNMI=2,1 OK AT+CMGS=18 //send to my self > 079179521201009511000c917952428650290004AA0441424344 +CMGS: 69 OK +CMTI: "SM",4

6.1.10 +CMT, Unsolicited Response (New SMS-DELIVER Receipt)

The +CMT unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SMS if the +CNMI parameter <mt> is set to 2. Refer to “+CNMI, New Message Indications to Terminal”.

This unsolicited message displays the received SMS-DELIVER message:

In text mode: (+CMGF=1):

+CMT: <oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length> <CR><LF><data>
(about parameters in italics, refer command Show Text Mode Parameters +CSDH).

In PDU mode: (+CMGF=0):

+CMT: [<alpha>], <length><CR><LF><pdu>

After sending a +CMT unsolicited response to the TE, the Modem will expect a +CNMA (new message

acknowledgement) from the TE within a predefined timeout of 15 seconds. Within the timeout the Modem will not send another +CMT unsolicited response to the TE before the previous one is acknowledged. If the +CMT is acknowledged within the timeout, the new SMS is not saved in the message storage. If the Modem does not receive acknowledgment after receiving a SMS within the required time, CNMI parameters will NOT be reset automatically and the +CMT unsolicited response will send to the TE again.

Command	Description
Set	N/A
Read	N/A
Test	N/A
Parameters	<p><oa> Message origination address.</p> <p><scts> Service center time stamp.</p> <p><toa> Type of origination address</p> <p><fo> First octet of the SMS</p> <p><pid> Protocol Identifier</p> <p><dcS> Data Coding Scheme</p> <p><sca> Service Center Address</p> <p><tosca> Type of Service Center Address</p> <p><data> Message contents.</p> <p><alpha> Alpha ID of message.</p> <p><length> In PDU mode: Size of message, in octets, excluding SMSC data. In TEXT mode: number of characters included in the <data></p> <p><pdu> Message header and contents in PDU mode format. See description in "+CMGR, Read Message".</p>
Example	<pre>AT+CMGF=0 OK AT+CNMI=1,2 OK AT+CSDH=1 OK AT+CMSS=142,"054565034" // send to myself +CMSS: 74 OK +CMT: "+972544565034",,"04/11/04,09: 48: 36+08",145,4,0,0,"+97254120032",145,3 ABC</pre>

Command	Description
	AT+CNMA OK AT+CMGS=18 // send to myself > 079179521201009511000c917952446505430004AA0441424344 +CMGS: 70 OK +CMT: ,23 0791795212010095040C917952446505430004502032115430800441424344

6.1.11 +CBM, Unsolicited Response (New CB Message Receipt)

The +CBM unsolicited response is sent to the TE upon receipt of a new cell broadcast message if +CNMI parameter <bm> is set to 2. Refer to “+CNMI, New Message Indications to Terminal”.

This unsolicited message displays the received CB message. The displayed CBM is not saved in message storage.

Unsolicited Response

In text mode: (+CMGF=1):

+CBM: <sn>,<mid>,<dcs>,<page>,<page><CR><LF><data>

In PDU mode: (+CMGF=0):

+CBM: <length><CR><LF><pdu>

Command	Description
Set	N/A
Read	N/A
Test	N/A
Parameters	<sn> Message serial number. <mid> Message ID. <page> Current page number. <pages> Total number of pages. <data> Message contents in text mode. <length> Size of message in PDU mode format, in octets. <pdu> Message header and contents in PDU mode format. See description in “+CMGR,, Read Message”.
Example	

6.1.12 +CDSI, Unsolicited Response (New SMS-STATUS-REPORT Indication)

The +CDSI unsolicited response is sent to the TE upon receipt of a new SMS-STATUS-REPORT SMS, if the +CNMI parameter <ds> is set to '2'.

This unsolicited message indicates that a new SMS-STATUS-REPORT message was received, and is stored in location <index>.

Unsolicited Response

+CDSI: <mem>,<index>

Command	Description
Set	N/A
Read	N/A
Test	N/A
Parameters	<mem> Message memory space. "SR" - status report storage. <index> Location of the new message.
Example	<pre> AT+CMGF=1 OK AT+CSMP=49,165 /*Set Message type to Status Report, see +CMGW*/ OK AT+CSMP? +CSMP: 49,167,0,0 OK AT+CNMI=1,0,0,2 OK AT+CMGS="052468000" > Hello +CMGS: 188 OK +CDSI: "SR",1 </pre>

6.1.13 +CDS, Unsolicited Response (New SMS-STATUS-REPORT Receipt)

The +CDS unsolicited response is sent to the TE upon receipt of a new mobile-terminated SMS if the +CNMI parameter <ds> is set to '1'.

This unsolicited message displays the received SMS-DELIVER message.

Unsolicited Response

In text mode: (+CMGF=1):

+CDS: <fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st><CR><LF>

In PDU mode: (+CMGF=0):

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

After sending a +CDS unsolicited response to the TE, the Modem will expect a +CNMA (new message acknowledgement) from the TE within a predefined timeout of 15 seconds. Within the timeout the Modem will not send another +CDS unsolicited response to the TE before the previous one is acknowledged. If the +CDS is acknowledged within the timeout, the new SMS is not saved in the message storage. If the Modem does not receive acknowledgment within the required time, CNMI parameters will NOT be reset automatically and the +CDS unsolicited response will send to the TE again.

Command	Description
Set	N/A
Read	N/A
Test	N/A
Parameters	<fo> First octet of the SMS <mr> Message Reference <ra> Message Recipient address <tora> Type of Recipient address <scts> Service center time stamp <dt> Discharge-Time <st> Status
Example	<pre> AT+CMGF=1 OK AT+CSMP=49,167 OK AT+CSMP? +CSMP: 49,167,0,0 OK AT+CNMI=1,0,0,1 OK AT+CMGS="052468000" > Hello </pre>

Command	Description
	+CMGS: 187 OK +CDS: 6,187,"+97252468000",145,"05/08/03,08: 56: 34+08","05/08/03,08: 56: 34+08",70 AT+CNMA OK

6.1.14 +CMGL, List Messages

These commands display a list of all SMS with the status value <stat>, from the Modem message storage <mem1> (selected using the +CPMS command). The command returns a series of responses, one per message, each item containing the message index, status, and data. If the status of a message is "RECEIVED UNREAD", execution of the +CMGL command changes the status of the message to "RECEIVED READ".

Command	Description
Set	<p>[Function] This command display a list of all SMS with the status value <stat>.</p> <p>[Syntax] AT+CMGL[=<stat>]</p> <p>[Response/Action] If text mode (+CMGF=1) command execution is successful and SMS-SUBMITs and/or SMS-DELIVERs: +CMGL: <index>,<stat>,<oa/da>[,<scts>][, <tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>[,,<scts>][, <tooa/toda>,<length>]<CR><LF><data>[...]] The parameters <tooa/toda>,<length> refer command shows the Text Mode Parameters +CSDH and will be shown according to +CSDH settings. If text mode (+CMGF=1) command execution is successful and SMS-COMMANDs: +CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>[...]] If text mode (+CMGF=1), command execution is successful and CBM storage: +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF></p>

Command	Description																		
	<p>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]</p> <p>If text mode (+CMGF=1) command execution is successful and SMS-STATUS_REPORTs:</p> <p>+CMGL: <index>,<stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st>[...]</p> <p>In PDU mode (+CMGF=0):</p> <p>+CMGL: <index>,<stat>[,<alpha>],<length><CR><LF><pdu>[<CR><LF> +CMGL: <index>,<stat>[,<alpha>],<length><CR><LF><pdu>[...]</p> <p>Or</p> <p>+CMS ERROR: <err></p>																		
Read	N/A																		
Test	<p>[Function] The Test command lists all the supported <stats></p> <p>[Syntax] AT+CMGL=?</p> <p>[Response/Action] +CMGL: (list of supported <stat>s)</p>																		
Parameters	<p><index> 1-352 Index of message in storage.</p> <p><stat> Status of message in memory:</p> <table border="1"> <thead> <tr> <th>PDU mode</th> <th>Text mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>“REC UNREAD”</td> <td>Received unread messages</td> </tr> <tr> <td>1</td> <td>“REC READ”</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>“STO UNSENT”</td> <td>Stored unsent messages</td> </tr> <tr> <td>3</td> <td>“STO SENT”</td> <td>Stored sent message</td> </tr> <tr> <td>4</td> <td>“ALL”</td> <td>All messages</td> </tr> </tbody> </table> <p>For fault tolerance,Two mode can be trade off</p> <p><oa/da> Original/destination address.</p> <p><data> Message contents in text mode</p> <p><length>In PDU mode: Size of message, in octets, excluding SMSC data. InTEXT mode: Number of characters included in <data>.</p> <p><pdu> Message header and contents in PDU mode format. See description in</p>	PDU mode	Text mode	Description	0	“REC UNREAD”	Received unread messages	1	“REC READ”	Received read messages	2	“STO UNSENT”	Stored unsent messages	3	“STO SENT”	Stored sent message	4	“ALL”	All messages
PDU mode	Text mode	Description																	
0	“REC UNREAD”	Received unread messages																	
1	“REC READ”	Received read messages																	
2	“STO UNSENT”	Stored unsent messages																	
3	“STO SENT”	Stored sent message																	
4	“ALL”	All messages																	

Command	Description
	<p>“+CMGR, Read Message”.</p> <p><tda/tda> Type of origination address / destination address</p> <p><fo> First octet of the SMS</p> <p><mr> Message Reference</p> <p><ra> Recipient-Address</p> <p><tora> Type of Recipient address</p> <p><scts> Service center time stamp</p> <p><ct>Command type</p> <p><sn> Message serial number</p> <p><mid> Message ID</p> <p><page> Current page number</p> <p><pages> Total number of pages</p> <p><dt>Discharge-Time</p> <p><st>Status</p>
<p>Example</p>	<pre> AT+CMGF=0 OK AT+CMGL=? +CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL") OK AT+CPMS="SM" // read messages from SIM. +CPMS: 2,20,11,61,2,20 OK AT+CMGL // read "rec-unread" messages with changing message stat +CMGL: 1,"REC UNREAD","+972544565034",,"05/01/01,09: 21 : 22+08" message text OK AT+CMGL OK // the message stat was changed. No "rec-unread" messages. AT+CPMS="ME" +CPMS: 11,61,11,61,2,20 OK AT+CMGL="sto sent" +CMGL: 142,"STO SENT", "054565034",, </pre>

Command	Description
	<pre> message text OK AT+CSDH=1 OK AT+CMGL="STO SENT" +CMGL: 142,"STO SENT","054565034",,,81,<message length> message text OK AT+CMGS=18 //send to myself > 079179521201009511000c917952446505430004AA0441424344 +CMGS: 68 OK AT+CPMS="sm" // change to SIM to read the incoming messages +CPMS: 2,20,11,61,2,20 OK </pre>
Reference	3GPP TS 27.005

6.1.15 +CMGR, Read Message

These commands handle the reading of SMS. The command displays the message in location <index> of the preferred message storage <mem1> (selected using the +CPMS command). If the status of the message is "RECEIVED UNREAD", the +CMGR command changes the status to "RECEIVED READ".

Command	Description
Set	<p>[Function] The Set command reads the SMS located at <index> in the Modem message storage and displays it</p> <p>[Syntax] AT+CMGR=<index></p> <p>[Response/Action] If text mode (+CMGF=1) command execution is successful and SMS-DELIVER: +CMGR: <stat>,<oa>[,<alpha>],<scts>[,<toa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<lengt h>]<CR><LF><data></p>

Command	Description												
	<p>If text mode (+CMGF=1) command execution is successful and SMS-SUBMIT: +CMGR: <stat>,<da>[,<alpha>][,<toda>,<fo>,<pid>,<dcs>[,<vp>],<sca>,<tosca>,<length>]<CR> <LF><data></p> <p>If text mode (+CMGF=1) command execution is successful and SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>[,<pid>[,<mn>][,<da>][,<toda>],<length><CR><LF><cdata>]</p> <p>If text mode (+CMGF=1) command execution is successful and CBM storage: +CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data></p> <p>If text mode (+CMGF=1) command execution is successful and SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>[,<ra>][,<tora>],<scts>,<dt>,<st></p> <p>If PDU mode (+CMGF=0) and command execution is successful: +CMGR: <stat>[,<alpha>],<length><CR><LF><pdu></p> <p>otherwise: +CMS ERROR: <err></p>												
Read	N/A												
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+CMGR=?</p> <p>[Response/Action] OK</p>												
Parameters	<p><index> Index in storage of the message to be retrieved.</p> <p><stat> Status of message in memory:</p> <table border="1"> <thead> <tr> <th>PDU mode</th> <th>Text mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>"REC UNREAD"</td> <td>Received unread messages</td> </tr> <tr> <td>1</td> <td>"REC READ"</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>"STO UNSENT"</td> <td>Stored unsend messages</td> </tr> </tbody> </table>	PDU mode	Text mode	Description	0	"REC UNREAD"	Received unread messages	1	"REC READ"	Received read messages	2	"STO UNSENT"	Stored unsend messages
PDU mode	Text mode	Description											
0	"REC UNREAD"	Received unread messages											
1	"REC READ"	Received read messages											
2	"STO UNSENT"	Stored unsend messages											

Command	Description
3	"STO SENT" Stored sent message
4	"ALL" All messages
	<p><alpha> Alpha ID of message (not present).</p> <p><length> In PDU mode: Size of message, in octets, excluding SMSC data. In TEXT mode: Number of characters included in <data>.</p> <p><pdu> Message header and contents in PDU mode format. See description in the table below.</p> <p><oa/da> Original/destination address.</p> <p><data> Message contents in text mode</p> <p><toda/toda> Type of origination address / destination address</p> <p><fo> First octet of the SMS</p> <p><pid> Protocol Identifier</p> <p><dcs> Data Coding Scheme</p> <p><sca> Service Center Address</p> <p><tosca> Type of Service Center Address</p> <p><vp> Validity Period. Either in integer format or in time-string format ("yy/MM/dd, hh: mm: ss±zz")</p> <p><mr> Message reference</p> <p><scts> Service center time stamp</p> <p><ct> Command type</p> <p><sn> Message serial number</p> <p><mn> Message Number</p> <p><cdata> Command-Data</p> <p><mid> Message ID</p> <p><page> Current page number</p> <p><pages> Total number of pages</p> <p><mr> Message reference</p> <p><ra> Message Recipient address</p> <p><tora> Type of Recipient address</p> <p><scts> Service center time stamp</p> <p><dt> Discharge-Time</p> <p><st> Status</p>

Command	Description
Example	<pre> AT+CPMS? +CPMS: "SM",13,50,"SM",13,50,"SM",13,50 OK AT+CMGR=1 +CMS ERROR: invalid index AT+CMGR=142 +CMGR: "STO SENT","054565034", message text OK AT+CSDH=1 OK AT+CMGR=142 +CMGR: "STO SENT","054565034",,129,25,0,0,"05/04/03,21 : 22: 23+08","+ 97254120032",145,<message length> message text OK AT+CMGW=18 > 079179521201009511000c917952428650290004AA0441424344 +CMGW: 143 OK AT+CMGR=143 +CMGR: 2,,23 0791795212010095040C917952428650290004502032110201800441424344 OK AT+CPMS="SM" // change to SM to read SMS-DELIVER messages. +CPMS: 2,20,11,61,2,20 OK AT+CMGR=1 +CMGR: "REC READ","+972544565034",,"05/02/23,11 : 20: 10+08",145,4,0,4,"+97254120032",145,4 41424344 OK AT+CMGF=0 OK </pre>

Command	Description
	<pre> AT+CMGR=1 +CMGR: 0,,23 0791 07917952140230F2040C917952446505430004502032110201800441424344 OK AT+CMGR=14 +CMGR: 0,,25 079179521201009506BC0B917952428600F0508030807512805080308075128046 // SMS-STATUS-REPORT message in PDU mode OK AT+CMGF=1 OK AT+CMGR=14 // SMS-STATUS-REPORT message in Text mode +CMGR: "REC READ",6,188,"+97252468000",145,"05/08/03,08: 57: 21+08","05/08/03,08: 57: 21+08",70 OK </pre>
Reference	3GPP TS 27.005

6.1.16 +CMSS, Send Message from Storage

This command sends a pre-stored message, written previously using the +CMGW command. The <da>, <toa> parameters are optional. If a DA is given, the message is sent to that address. Otherwise the message is sent to the DA it was stored with (if any was entered). If no DA is found, an error occurs.

When the given index is an incoming message index the header settings will be as follows:

- ◆ <first-octet> will be SMS-SUBMIT and VPF - relative.
- ◆ The TP-RP and TP-UDHI settings will be taken from the incoming message's first octet.
- ◆ <vp> - will be set to the default value -167 - as defined in 03.40.
- ◆ <sca>, <tosca>, <pid> and <dcs> will be set according the incoming message parameters.
- ◆ If <da> and/or <toa> are not given by the command, the <oa> and <tooa> will be set instead.



Note:

Any character sent by TE to Modem before Modem has reported a result of AT+CMSS operation, will abort AT+CMSS command execution. However, if SMS was already sent to network and sending operation was successful, the result of operation "+CMSS <mr>" will be reported by Modem. If after aborting AT+CMSS command execution and before result of operation was reported by Modem, a second AT+CMSS command is executed, then the result of the second AT+CMSS operation only will be reported by Modem.

Command	Description
Set	<p>[Function] The Set command sends a message from storage to the network.</p> <p>[Syntax] AT+CMSS=<index>[,<da>[,<toda>]]</p> <p>[Response/Action] +CMSS: <mr> or: +CMS ERROR: <err></p>
Read	N/A
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+CMSS=?</p> <p>[Response/Action] OK</p>
Parameters	<p><index> 1-352 Index in storage of the message to be sent.</p> <p><da> Destination address in quoted string. This field contains a single phone number.</p> <p><toda> Type of DA. Value between 128-255 (according to GSM 03.40, 9.1.2.5). If this field is not given and first character of <da> is '+', <toda> will be 145, otherwise 129.</p> <p><mr> Sent message reference number.</p>
Example	<pre>AT+CMSS=7 +CMSS: 12 OK AT+CMSS=7,"054565132",129 +CMSS: 13 OK</pre>
Reference	3GPP TS 27.005

6.1.17 +CMGW, Write Message to Memory

This command is used to write and save a message to <mem2>. The message is saved in memory, and the message index is displayed to the user.

By default, messages are saved with the status of "STO UNSENT", but status "STO SENT" can be applied using the <stat> parameter.

In TEXT mode, the header parameters will be set according to CSMP settings.

Command	Description
Set	<p>[Function] The Set command writes a message and stores it.</p> <p>[Syntax] If text mode (+CMGF=1): AT+CMGW[=<da>[,<toda>[,<stat>]]]<CR>text is entered<ctrl-Z/ESC> if PDU mode (+CMGF=0): AT+CMGW=<length>[,<stat>]<CR> PDU is given<ctrl-Z/ESC></p> <p>[Response/Action] +CMGW: <index> or: +CMS ERROR: <err></p>
Read	N/A
Test	N/A
Parameters	<p><da> destination address, string type represented in the currently selected character set.</p> <p><toda> type of destination address. 129 number in national format 145 number in international format (contains the "+")</p> <p><stat> message status. "REC UNREAD" new received message unread (default for DELIVER messages) "REC READ" received message read "STO UNSENT" message stored not yet sent (default for SUBMIT</p>

Command	Description
	<p>messages)</p> <p>"STO SENT" message stored already sent</p>
<p>Example</p>	<pre> AT+CMGF=1 OK AT+CMGW="5124335432" >This is the message body <CTRL+Z> //<CTRL+Z> ends the prompt text mode and returns to regular AT command mode +CMGW: 126 OK AT+CMGW > TEST <CTRL+Z> +CMGW: 195 OK AT+CMGF=0 OK AT+CMGW=24 >079179521201009511FF0B917962543940F20008001400410042004300440045 <CTRL+Z> +CMGW: 128 OK AT+CMGR=128 +CMGR: 2,,24 079179521201009511FF0B917962543940F20008001400410042004300440045 OK AT+CMGF=1 OK AT+CSDH=1 OK AT+CMGR=128 +CMGR: "STO UNSENT", "+97264593042",,145,17,0,8,0,"+972521100059",145,5 00410042004300440045 OK </pre>

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Command	Description
	<pre> AT+CSMP=25,"05/03/15,21 : 22: 23+08",0,0 OK AT+CMGW="0544565034" A<CTRL+Z> +CMGW: 129 OK AT+CMGR=129 +CMGR: "STO UNSENT", "0544565034",,129,25,0,0,"05/03/15,21 : 22: 23+08", "+972521100059",145,1 OK AT+CMGF=0 OK AT+CMGR=129 +CMGR: 2,,20 079179521201009519FF0A8150446505430000503051122232800141 AT+CMGW=18 > 0011000c917952428650290004AA0441424344 // SCA is not given +CMGW: 130 OK AT+CMGR=130 +CMGR: 2,,18 079179521201009511000C917952428650290004AA0441424344 OK AT+CMGW=19 > 079179521201009511000c917952428650290004AA0441424344 //Invalid length (19) +CMS ERROR: invalid PDU mode parameter AT+CMGW=19 > 079179521201009511000c917952428650290004AA044142434477 //UDL is not equal to UD length +CMS ERROR: invalid PDU mode parameter AT+CMGW=17 > 079179521201009501000c9179524286502900040441424344 //No VP in PDU message +CMGW: 131 </pre>

Command	Description
	OK AT+CMGR=131 +CMGR: 2,,17 079179521201009501000C9179524286502900040441424344 OK AT+CMGW=14 > 07917952140230F212000000000c9179524286502900 //SMS Command +CMGW: 132 OK AT+CMGR=132 +CMGR: 2,,14 07917952140230F212000000000C9179524286502900 OK AT+CMGF=1 OK AT+CMGR=132 +CMGR: "STO UNSENT",18,0,0,0,"+972524680592",145,0 OK
Reference	3GPP TS 27.005

6.1.18 +CMGD, Delete Message

This command handles deletion of a single message from memory location <index>, or multiple messages according to <delflag>. If the optional parameter <delflag> is entered, and is greater than 0, the <index> parameter is practically ignored. If deletion fails, result code +CMS ERROR: <err> is returned.



Note:

The deletion of multiple commands is a time-consuming process that may require more than 60 seconds to complete.

Command	Description
Set	<p>[Function]</p> <p>This command handles deletion of a single message from memory location <index>, or multiple messages according to <delflag>.</p> <p>[Syntax]</p>

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Command	Description
	AT+CMGD=<index>[,<delflag>] [Response/Action] OK or: +CME ERROR: <err>
Read	N/A
Test	[Function] The Test command displays the supported values of <index>, it list the index where have stored the SMS. [Syntax] AT+CMGD=? [Response/Action] +CMGD: (list of valid<index>s), (list of valid<delflag>s) OK
Parameters	<index> 1-352 Index in the SMS memory of the message to be deleted. <delflag> 0 Deletes the message specified in <index> 1 Deletes all read messages 2 Deletes all read messages and sent MO messages 3 Deletes all read messages, sent and unsent MO messages 4 Deletes all messages
Example	AT+CMGD=4 OK AT+CMGD=1,3 OK
Reference	3GPP TS 27.005

6.1.19 +CGSMS, Select Service for MO SMS Messages

This command handles the selection of the service or service preference used by the Modem to send mobile-originated SMS messages.



Note:

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The Set command selects the service or service preference used to send SMS messages. The value that is set is not retained after a power cycle.

Command	Description
Set	<p>[Function] The Set command selects the service or service preference used to send SMS messages. The value that is set is not retained after a power cycle.</p> <p>[Syntax] AT+CGSMS=[<service>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command displays the current SMS service preference setting.</p> <p>[Syntax] AT+CGSMS?</p> <p>[Response/Action] +CGSMS: <service> OK</p>
Test	<p>[Function] The Test command displays a list of currently available <service>s on the network.</p> <p>[Syntax] AT+CGSMS=?</p> <p>[Response/Action] +CGSMS: (list of currently available<service>s) OK</p>
Parameters	<p><service> Indicates the service or service preference to be used.</p> <p>0 GPRS</p> <p>1 Circuit switched (default)</p> <p>2 GPRS preferred (use circuit switched if GPRS is not available)</p> <p>3 Circuit switched preferred (use GPRS if circuit switched is not available)</p>

Command	Description
	Other values are reserved and will result in an ERROR response to the Set command.
Example	AT+CGSMS=? CGSMS: (0-3) OK AT+CGSMS? CGSMS: 1 OK
Reference	3GPP TS 27.007

6.1.20 +CMGS, Send SMS to Network

This command sends an SMS from the Modem to the network. The message reference value <mr> is returned to the Modem upon successful delivery of the message.

Valid <tda> will be any value between 128-255.

The header parameters in TEXT mode will be set according to CSMP settings.



Note:

Any character sent by TE to Modem before Modem has reported a result of AT+CMGS operation, will abort AT+CMGS command execution. However, if SMS was already sent to network and sending operation was successful, the result of operation "+CMGS <mr>" will be reported by Modem.

If after aborting AT+CMGS command execution and before result of operation was reported by Modem, a second AT+CMGS command is executed, then the result of the second AT+CMGS operation only will be reported by Modem.

Command	Description
Set	<p>[Function]</p> <p>The Set command validates the input parameters, sends the SMS to network and reports the result of the operation to the Modem.</p> <p>[Syntax]</p> <p>If text mode (+CMGF=1): AT+CMGS=<da>[,<tda>]<CR>text is entered<ctrl-Z/ESC></p> <p>If PDU mode (+CMGF=0): AT+CMGS=<length><CR></p>


Command	Description
	<p>PDU is entered<ctrl-Z/ESC></p> <p>[Response/Action]</p> <p>if text mode (+CMGF=1) and sending successful:</p> <p>AT+CMGS: <mr>[,<scts>]</p> <p>OK</p> <p>if PDU mode (+CMGF=0) and sending successful:</p> <p>+CMGS: <mr></p> <p>OK</p> <p>if sending fails:</p> <p>+CMS ERROR: <err></p>
Read	N/A
Test	<p>[Function]</p> <p>This command only returns OK.</p> <p>[Syntax]</p> <p>AT+CMGS=?</p> <p>[Response/Action]</p> <p>OK</p>
Parameters	<p><da> Destination address in quoted string. This field contains a single MIN number.</p> <p>< toda> Type of DA. Value between 128-255 (according to GSM 03.40, 9.1.2.5). If this field is not given and first character of <da> is '+', <toda> will be 145, otherwise 129.</p> <p><length> Size of message in PDU mode format, in octets, excluding SMSC data.</p> <p><mr> Sent message reference number.</p> <p>PDU Message header and contents in PDU mode format. See description in “+CMGW, Write Message to Memory”.</p>
Example	<p>AT+CMGF=1</p> <p>OK</p> <p>AT+CMGS="064593042",129</p> <p>>This is the message body <CTRL+Z> //<CTRL+Z> ends the prompt text mode and returns to regular AT command mode</p> <p>OK</p> <p>AT+CMGF=0</p>

Command	Description
	OK AT+CMGS=24 >079179521201009511FF0B917962543940F20008001400410042004300440045 <CTRL+Z> +CMGS: 128 OK
Reference	3GPP TS 27.005

6.1.21+CSCB, Cell Broadcast Messages

This command handles the selection of cell broadcast message types and data coding schemes received by the Modem.

Command	Description
Set	<p>[Function] The Set command sets the cell broadcast message type and data coding scheme.</p> <p>[Syntax] AT+CSCB=[<mode>[,<mids>[,<dcss>]]]</p> <p>[Response/Action] If mode=0 and <mids> is not specified, then no channels are accepted, and the Modem channel/mid list is cleared. OK or: +CMS ERROE: <err></p>
Read	<p>[Function] The Read command displays the current MID and DCS settings.</p> <p>[Syntax] AT+CSCB?</p> <p>[Response/Action] +CSCB: <mode>,<mids>,<dcss> OK</p>
Test	[Function]

Command	Description
	<p>The Test command displays the supported values of <mode>.</p> <p>[Syntax] AT+CSCB=?</p> <p>[Response/Action] +CSCB: (list of supported <mode>s) OK</p>
Parameters	<p><mode> The current broadcast message mode: 0 MIDs and DCSs accepted 1 MIDs and DCSs not accepted</p> <p><mids> Cell broadcast message identifiers 0-65534</p> <p><dcss> Cell broadcast message data coding schemes 0-255</p> <p> Note: A combination of discrete values or intervals can be entered for <mids> and <dcss>, for example, "0,1,5,320-324,922".</p> <ul style="list-style-type: none"> <input type="checkbox"/> The default value for missing <mode> is 1. <input type="checkbox"/> The string type lists <mids> and <dcss> may include only numbers (0-9), comma and minus (-) characters. <input type="checkbox"/> <mids> = 1-5 is equivalent to five channels. <input type="checkbox"/> The dcss specified refers to all incoming messages, and not only to mids specified in the same AT command.
Example	<p>Testing the modes supported: AT+CSCB=? +CSCB: (0,1) OK</p> <p>Reading the current mid and dcs lists: AT+CSCB? +CSCB: 0,"", "" OK</p> <p>Adding channels 3, 4,5,6,22 to mid list and languages 1,8 to dcs list: AT+CSCB=0,"3-6,22","1,8" OK</p>

Command	Description
	AT+CSCB? +CSCB: 0,"3-6,22","1,8" OK AT+CSCB=1,"4,6","1" OK AT+CSCB? +CSCB: 1,"4,6","1" OK
Reference	3GPP TS 27.005

7 SIM TOOL KIT Raw Mode Commands

7.1 Raw Mode Commands Lists

7.1.1 +CUSATR, Read USAT Profile

This command is used to read USAT profile.

Command	Description
Set	<p>[Function] Set command +CUSATR=<profile_storage> returns the profile specified by <profile_storage>. If command issued without parameter, +CUSATR, returns all profiles.</p> <p>[Syntax] AT+CUSATR[=<profile_storage>]</p> <p>[Response/Action] +CUSATR: <profile_storage>,<profile>[<CR><LF>+CUSATR: profile_storage>,<profile> [...]] or +CME ERROR: <err></p>
Read	N/A

Command	Description
Test	<p>[Function] Test command returns values supported as a compound value.</p> <p>[Syntax] AT+CUSATR=?</p> <p>[Response/Action] +CUSATR: (list of supported <profile_storage>s) OK</p>
Parameters	<p><profile_storage> Is an integer type.</p> <p>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]).</p> <p><profile> Is 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].</p>
Example	
Reference	3GPP TS 27.007

7.1.2 +CUSATW, Write USAT Profile


This command is used to write USAT profile.

Upon an attempt to store or reset a profile that conflicts with an already stored profile or the list of MT only facilities, the operation fails and the profile referred to by command parameter <profile_storage> remains

unchanged. The MT responds with +CUSATW : <profile_storage>,<conflict_profile> where <profile_storage> refers the conflicting profile followed by the final result code +CME ERROR: 3 (Operation not allowed). The rules for detecting conflicts are defined in 3GPP TS 31.111 [92].

Successful execution of the command does not result in any information response.

Command	Description
Set	<p>[Function] Set command without parameters resets stored TE and MT profiles to their default values. Adding parameter <profile_storage> to the AT command resets only the referred storage to its default value. Execution command issued with accompanied parameter <profile>, stores the given <profile> to non-volatile memory in the MT.</p> <p>[Syntax] AT+CUSATW[=<profile_storage>,<profile>]]</p> <p>[Response/Action] +CUSATW: <profile_storage>,<profile>[<CR><LF>+cusatw: <profile_storage>,<profile> [...]] or +CME ERROR: <err></p>
Read	N/A
Test	<p>[Function] Test command returns values supported as a compound value.</p> <p>[Syntax] AT+CUSATW=?</p> <p>[Response/Action] +CUSATW: (list of supported <profile_storage>s) OK</p>
Parameters	<p><profile_storage> Is an integer type.</p> <p>0 TE. Refers profile storage for the facilities supported by the TE. Default value is a blank profile with all bits set to zero.</p> <p>1 MT. Refers profile storage for the facilities to be supported by MT, which can be a subset of the default MT facilities (see +CUSATW).</p>

Command	Description
	<p>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.</p> <p>5 Refers to a conflict between the TE profile and the list of MT only facilities.</p> <p> Note: Value 5 for <profile_storage> will be supported only in response direction.</p> <p><profile> 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].</p> <p><conflict_profile> Is 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].</p>
Example	
Reference	3GPP TS 27.007

7.1.3 +CUSATD, Profile download upon start-up

This command is used to determine to download which USAT profile during next bootup.

This command determines if, and optionally which profile should be downloaded to the UICC automatically upon startup. If, prior to a restart/start-up, the +CUSATD settings have not been altered, then the default settings determine the behaviour upon start-up.

However, if the parameters of +CUSATD has been set to other than default and then a restart is performed (e.g. by +CFUN), these values determine the behaviour. This is true for one restart only after altering +CUSATD parameters as they are always reset to default at the end of the next UICC start-up (i.e. when the USIM initialisation as specified in 3GPP TS 31.102 [98] has been completed).

The command without parameters resets the parameters to their default values.

The command can be used if the UICC is already in active state upon +CUSATA and the UICC does not support the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]).

+CUSATD=<download>,1 also enables the unsolicited result code +CUSATS: <UICC_state>. The MT uses this unsolicited result code to indicate that a profile download is performed (setting +CUSATD=0,1 or

+CUSATD=1,1) or that it is ready for profile download (setting +CUSATD=2,1). In both cases, the MT also indicates the end of UICC start-up by the unsolicited result code +CUSATS: 4. If the UICC is awaiting PIN verification during start-up, this is also reported.

When using +CUSATD=1, the +CUSATA=1 command has to be used to enable TE profile facility handling after restart. In the time between profile download and issuance of +CUSATA=1, the UICC may already attempt to issue proactive commands. The MT will not send these to the TE, but rather give the UICC the response "terminal currently unable to process command" autonomously. The UICC may implement only a limited number of retries, which can potentially leave USAT in an unwanted state if the +CUSATA=1 command arrives late.



Note:

Care has to be taken when using +CUSATD=2. If no +CUSATA=2 or +CUSATA=3 is sent during start-up, USAT is also blocked for the MT.

Command	Description
Set	<p>[Function] Set command The command without parameters resets the parameters to their default values. Enables which profile needs to be downloaded during next bootup.</p> <p>[Syntax] AT+CUSATD=[<download>[,<reporting>]]</p> <p>[Response/Action] OK or +CME ERROR: <err></p>
Read	<p>[Function] Read command returns the current <download> and <reporting></p> <p>[Syntax] AT+CUSATD?</p> <p>[Response/Action] +CUSATD: <download>,<reporting> OK</p>
Test	<p>[Function] Test command returns values supported as a compound value.</p>

Command	Description
	<p>[Syntax] AT+CUSATD=[<download>[,<reporting>]]</p> <p>[Response/Action] +CUSATD: (list of supported <profile_storage>s) OK</p>
Parameters	<p><download></p> <p>Is an integer type. Parameter decides when/if to perform a profile download to UICC and which profile to download. The default value is implementation specific.</p> <p>0 Download MT default profile automatically during next start-up.</p> <p>1 Download the combined TE and MT profile (merger of the profiles written by +CUSATW) automatically during next start-up. The rules for merging profiles are defined in 3GPP TS 31.111 [92].</p> <p>2 Halt next UICC start-up when ready for profile download. Profile to download will be selected and download will be triggered by +CUSATA.</p> <p><reporting></p> <p>Is an integer type. Parameter enables unsolicited result code +CUSATS:</p> <p><UICC_state></p> <p>to notify the TE about a new state during start-up.</p> <p>0 Disable +CUSATS, i.e. no notification.</p> <p>1 Enable +CUSATS, i.e. notify TE.</p> <p><UICC_state></p> <p>Is an integer type. Parameter reports that the UICC entered a new state during start-up or that the UICC ended startup and entered active state.</p> <p>1 UICC start-up halted and ready for profile download. This state is reached if +CUSATD=2 was issued before restart. UICC start-up will continue upon +CUSATA=2 or +CUSATA=3.</p> <p>2 Profile download completed, UICC startup continuing.</p> <p>3 UICC awaiting PIN verification.</p> <p>4 UICC active.</p>
Example	
Reference	3GPP TS 27.007

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7.1.4 +CUSATA, Activate USAT profile

This command is used to activate USAT profile.

A positive result upon a +CUSATA=1 or +CUSATA=3 command (also) enables TE profile facility handling via unsolicited result codes +CUSATP: <proactive_command> and +CUSATEND. The MT uses the unsolicited result code +CUSATP: <proactive_command> to forward to the TE proactive commands issued by the UICC. The unsolicited result code +CUSATEND is issued by the MT when the UICC indicates that the proactive command session is terminated, i.e. in response to a USAT terminal response, the UICC indicates that no other USAT proactive command is pending. Lastly, terminal responses to the proactive commands can now be issued with +CUSATT=<terminal_response> and envelope commands can be issued with +CUSATE=<envelope_command>.

If the action requested by the +CUSATA command can not be performed, the information response +CUSATA: <UICC_state>,[<additional_profile_support>] is returned with appropriate values, followed by the final result code +CME ERROR: 4 (Operation not supported) in case the UICC does not support USAT at all, or the final result code +CME ERROR: 3 (Operation not allowed) in all other cases.

If the UICC is already in active state and the UICC does not support the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]), the TE has the option to perform a reset of the UICC or use +CFUN to get back to an initial non-active UICC state. The +CUSATD command can be used to set profile handling upon the next restart.

All USAT proactive commands that the MT does not process itself and all terminal responses from the TE are transparently forwarded by the MT. The routing mechanism for USAT commands supported by both entities is specified in 3GPP TS 31.111 [92].

Command	Description
Set	<p>[Function] Set command +CUSATA retrieves the current UICC state or downloads a profile to the UICC and/or activates handling of the TE profile facilities.</p> <p>[Syntax] AT+CUSATA[=<activation>]</p> <p>[Response/Action] +CUSATA: <UICC_state>,[<additional_profile_supp ort>=""]>]</p>

Command	Description
	OK or +CME ERROR: <err>
Read	N/A
Test	<p>[Function] Test command returns values supported as a compound value.</p> <p>[Syntax] AT+CUSATA=?</p> <p>[Response/Action] +CUSATA: (list of supported <activation>s) OK</p>
Parameters	<p><activation> Is an integer type. 0 Return status information only, in information response: +CUSATA: <UICC_state>[,<additional_profile_support>]. 1 Enable TE profile facility handling only, no profile download. This action can only be used if the combined TE and MT profile was downloaded during start-up (setting +CUSATD=1). 2 Download MT default profile. 3 Download the combined TE and MT profile (merger of the profiles written by +CUSA TW) an enable TE profile facility handling. The rules for merging profiles are defined in 3GPP TS 31.111 [92].</p> <p><UICC_state> Is an integer type. Parameter reports that the UICC entered a new state during start-up or that the UICC ended startup and entered active state. 1 UICC start-up halted and ready for profile download. This state is reached if +CUSATD=2 was issued before restart. UICC start-up will continue upon +CUSATA=2 or +CUSATA=3. 2 Profile download completed, UICC startup continuing. 3 UICC awaiting PIN verification. 4 UICC active.</p>

Command	Description
	<p><additional_profile_support></p> <p>Is an integer type. Indicates whether the UICC supports the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]). The value may not be available during early phases of start-up.</p> <p>0 No support. 1 Supported.</p> <p><proactive_command></p> <p>Is a string type in hexadecimal character format. Proactive command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.</p>
Example	
Reference	3GPP TS 27.007

7.1.5 +CUSATT, Send USAT terminal response

This command is used to send Terminal Profile.

Command	Description
Set	<p>[Function]</p> <p>Set 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).</p> <p>[Syntax]</p> <p>AT+CUSATT=<terminal_response></p> <p>[Response/Action]</p> <p>OK or +CME ERROR: <err></p>
Read	N/A
Test	<p>[Function]</p> <p>This command only returns OK.</p> <p>[Syntax]</p>

Command	Description
	AT+CUSATT=? [Response/Action] OK
Parameters	<terminal_response> Is a 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.
Example	
Reference	3GPP TS 27.007

7.1.6 +CUSATE, Send USAT envelope command

This command is used to send USAT Enevelope command.


Command	Description
Set	[Function] Set 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. [Syntax] AT+CUSATE=<envelope_command> [Response/Action] +CUSATE: <envelope_response>[,<busy>] OK or +CME ERROR: <err>
Read	N/A
Test	[Function] This command only returns OK. [Syntax] AT+CUSATE=?

Command	Description
	[Response/Action] OK
Parameters	<p><envelope_command> Is a string type in hexadecimal character format. Envelope command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.</p> <p><envelope_response> Is a 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. Empty if the UICC does not provide response data.</p> <p><busy> Is an integer type. 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.</p>
Example	
Reference	3GPP TS 27.007

7.1.7 +STKPROF, Reading and changing the terminal profile

This command allows reading and changing the terminal profile data. The terminal profile sent by external STK client states the facilities relevant to SIM Application Toolkit that is supported.

Command	Description
Set	<p>[Function] This command is used to change the terminal profile data.</p> <p>[Syntax] AT+STKPROF=<length>,<data></p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	[Function]

Command	Description
	<p>This command returns the terminal profile data.</p> <p>[Syntax] AT+STKPROF?</p> <p>[Response/Action] +STKPROF: <length>,<data> e.g. +STKPROF=4,"1F7F" OK</p>
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+STKPROF=?</p> <p>[Response/Action] OK</p>
Parameters	<p>Possible values of <length>: integer type value; length of the characters that are sent to TE in <data></p> <p> Note: <length> set to 0 forces a reset to the default terminal profile stored in the ME.</p> <p>Possible values of <data>: terminal profile data coded in hex format.</p>
Example	<p>AT+STKPROF?</p> <p>+STKPROF: 62,"FFFFFFFF7F9100FFBF0302000000000800CB000000EE4F015700003F7F0800"</p> <p>OK</p>
Reference	3GPP TS 27.007

8 Access and security

8.1 Commands

8.1.1 A/, Repeat Last Command

This command repeats the last command. It is not necessary to press <Enter> after this command.

Command	Description
Set	<p>[Function] This command repeats the last command.</p> <p>[Syntax] A/</p> <p>[Response/Action] Repeats last command</p>
Read	N/A
Test	N/A
Parameters	N/A
Example	<pre>ATI ".Built@Nov 2 2015:14:11:54" OK A/ ".Built@Nov 2 2015:14:11:54"</pre>

8.1.2 AT, Check AT Communication

This command only returns OK.

Command	Description
Set	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT</p> <p>[Response/Action]</p>

Command	Description
	OK
Read	N/A
Test	N/A
Parameters	N/A
Example	

8.1.3 +CPIN, Enter PIN for Unlocking SIM or Enter PUK for Unlocking SIM

This command unlocks the SIM card when the proper SIM PIN is provided and unblocks the SIM card when the proper SIM PUK is provided.

The SIM card is unlocked only once the provided pin is verified as the SIM PIN. If the required PIN (determined by the error code returned from the requested operation or the Read command) 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 card. When entering the pin, a <new pin> is not required.

A SIM card related error is returned if an AT command operation is unsuccessful due to a SIM card problem. The following table shows the SIM card errors.

Error	Description
10 SIM not inserted	SIM Card is not inserted
11 SIM PIN required	SIM Card waiting for SIM PIN to be entered
12 SIM PUK required	SIM PIN is blocked
13 SIM failure	SIM Card is permanently blocked
17 SIM PIN2 required	SIM Card is waiting for SIM PIN2 to be entered
18 SIM PUK2 required	SIM PIN2 is blocked

Command	Description
Set	<p>[Function]</p> <p>The Set command sends the password to the Modem that is necessary before it can be operated (SIM PIN or SIM PUK). If there is no PIN request pending, no action is taken towards the Modem, and an error message, +CME ERROR, is returned to the terminal.</p> <p>The Set command issued gives the code (SIM PIN or SIM PUK) corresponding to the error code required or returned as the result of the Read command. For example, if the SIM PIN is blocked, the error code 11 or "SIM PIN required" is returned. The user must</p>

Command	Description
	<p>then issue the Set command with the SIM PIN.</p> <p>[Syntax]</p> <p>AT+CPIN=[<puk>or <pin>][,<newpin>]</p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The Read command returns an alphanumeric string indicating the status of the SIM card, and whether a password is required or not. This is an independent SIM card lock status check only, and does not check the phone lock status.</p> <p>[Syntax]</p> <p>AT+CPIN?</p> <p>[Response/Action]</p> <p>+CPIN: <code></p> <p>OK</p> <p>or:</p> <p>+CME ERROR:</p>
Test	<p>[Function]</p> <p>This command only returns OK.</p> <p>[Syntax]</p> <p>AT+CPIN=?</p> <p>[Response/Action]</p> <p>OK</p>

Command	Description
Parameters	<p><puk> PUK code for unblocking a blocked phone</p> <p><pin> Current PIN for unlocking a locked phone</p> <p><newpin> New PIN (after changing or after entering PUK) 4 - 8 digits</p> <p><code></p> <p>READY MT is not pending for any password</p> <p>SIM PIN MT is waiting SIM PIN to be given</p> <p>SIM PUK MT is waiting SIM PUK to be given</p> <p>PH-SIM PIN MT is waiting phone-to-SIM card password to be given</p> <p>PH-FSIM PIN MT is waiting phone-to-very first SIM card password to be given</p> <p>PH-FSIM PUK MT is waiting phone-to-very first SIM card unblocking password to be given</p> <p>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)</p> <p>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)</p> <p>PH-NET PIN MT is waiting network personalization password to be given</p> <p>PH-NET PUK MT is waiting network personalization unblocking password to be given</p> <p>PH-NETSUB PIN MT is waiting network subset personalization password to be given</p> <p>PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given</p> <p>PH-SP PIN MT is waiting service provider personalization password to be given</p> <p>PH-SP PUK MT is waiting service provider personalization unblocking password to be given</p> <p>PH-CORP PIN MT is waiting corporate personalization password to be given</p> <p>PH-CORP PUK MT is waiting corporate personalization unblocking password to be given</p> <p>SIM PIN AT+CPIN=<pin></p> <p>SIM PUK AT+CPIN=<puk>,<newpin></p>

Command	Description
	SIM PUK2 AT+CPIN=<puk2>,<newpin2> SIM PIN 2 AT+CPIN=<pin2>
Example	<pre> AT+CPIN=? OK AT+CLCK="SC",1,"<correct PIN>" //Not case-sensitive OK The facility is enabled by the +CLCK command (Refer to "+CLCK, Facility Lock") AT+CPIN? +CPIN: SIM PIN OK AT+CPIN="<correct PIN>" OK AT+CPIN? +CPIN: READY OK The status of the SIM is still enabled, but the PIN is READY for this session. The SIM is enabled per session. After power-up SIM must be unlocked again by using the +CLCK command. The following case shows an example of three unsuccessful attempts at entering the PIN: AT+CPIN? +CPIN: SIM PIN OK AT+CPIN="<wrong pin>" +CME ERROR: incorrect password AT+CPIN="<wrong pin>" +CME ERROR: incorrect password AT+CPIN="<wrong pin>" +CME ERROR: SIM PUK required AT+CPIN? +CPIN: SIM PUK //PIN is blocked. The PUK is needed for unblocking. OK AT+CPIN="<PUK>","<NEW PIN>" //Enter PUK and new PIN OK </pre>

Command	Description
	AT+CLCK="FD",1,"<wrong PIN2>" +CME ERROR: incorrect password AT+CLCK="FD",1,"<wrong PIN2>" +CME ERROR: incorrect password AT+CLCK="FD",1,"<wrong PIN2>" +CME ERROR: SIM PUK2 required AT+CPIN? +CPIN: SIM PUK2 //PIN2 is blocked. The PUK2 is needed for unlocking. OK AT+CPIN="<PUK2>","<NEW PIN2>" //Enter PUK2 and new PIN2 OK
Reference	3GPP TS 27.007

8.1.4 +CPWD, Change Password

This command sets a new password for the facility lock. The password can only be changed once the required facility is enabled by the +CLCK command.

A password can be changed only if the provided password <oldpwd> has been verified. The entered password <newpwd> must also comply to the password rules. The facility value <fac> is not case-sensitive. In the password value, letters are not allowed.

Command	Description
Set	[Function] Set a new password for the facility lock. [Syntax] AT+CPWD=<fac>,<oldpwd>,<newpwd> [Response/Action] OK or: +CME ERROR: <err>
Read	N/A

Command	Description
<p>Test</p>	<p>[Function]</p> <p>The Test command returns a list of pairs which represent the available facilities, and the maximum length of their passwords.</p> <p>[Syntax]</p> <p>AT+CPWD=?</p> <p>[Response/Action]</p> <p>+CPWD: list of Supported (<fac>,<pwdlength>)s</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
<p>Parameters</p>	<p><fac> Description</p> <p>SC SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)</p> <p>FD SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)</p> <p>AO BAO (Bar All Outgoing Calls)</p> <p>OI BOIC (Bar Outgoing International Calls)</p> <p>OX BOIC-exHC (Bar Outgoing International Calls except to Home Country)</p> <p>AI BAIC (Bar All Incoming Calls)</p> <p>IR BIC-Roam (Bar Incoming Calls when Roaming outside the home country)</p> <p>AB All Barring services (applicable only for <mode>=0)</p> <p>AG All outgoing barring services (applicable only for <mode>=0)</p> <p>AC All incoming barring services (applicable only for <mode>=0)</p> <p>P2 SIM PIN2</p> <p><fac> List of supported facilities. All the facility messages, except for SC and P2, are sent to the network. (The facilities are not case-sensitive.)</p> <p>Please see <fac> Table.</p> <p><oldpwd> String type, 4-8 character old password specified for the facility from the Modem user interface.</p> <p><newpwd> String type, 4-8 character new password specified by the user.</p>

Command	Description
	<pwd length> Maximum length of the facility password. Integer type.
Example	<pre> AT+CPWD=? +CPWD: ("SC",8),("AO",8),("OI",8),("OX",8),("AI",8),("IR",8),("AB",8),("AG",8), ("AC",8),("P2",8) OK AT+CPWD? +CME ERROR: operation not supported AT+CLCK="sc",1,"current pin password" OK AT+CPWD="sc","incorrect old password","new password" +CME ERROR: incorrect password AT+CLCK="sc",2 +CLCK: 0 OK AT+CPWD="sc","old password","new password" +CME ERROR: operation not allowed AT+CLCK="fd",1,"current pin2 password" AT+CPWD="p2","old password","new password" OK AT+CLCK="ai",2 +CLCK: 0,1 +CLCK: 0,2 +CLCK: 0,4 OK AT+CLCK="ai",1,"correct password" OK AT+CLCK="ai",2 +CLCK: 1,1 +CLCK: 1,2 +CLCK: 1,4 OK AT+CPWD="ai","old password","new password" OK </pre>

Command	Description
Reference	3GPP TS 27.007

8.1.5 +CLCK, Facility Lock


This command locks, unlocks or interrogates a Modem or a network facility <fac> (any kind of call barring program).

A password is mandatory for performing locking and unlocking actions, but not for querying. The features of the Modem that are affected by this are fixed dialing list.

When querying the status of a single call barring program <mode>=2, the <status> for each call type will be returned.

For <fac>="SC", SIM Card PIN setting and for <fac>="FD", SIM Fixed Dialing memory setting, the <class> is irrelevant (For more information about <class>, refer to the following table shows the +CLCK parameters.). For "SC", the <passwd> is SIM PIN. For "FD", the <passwd> is SIM PIN2.

Command	Description
Set	<p>[Function] The Set command performs the specified <mode> action on the specified <fac>.</p> <p>[Syntax] AT+CLCK=<fac>,<mode>[,<passwd>[,<classx>]]</p> <p>[Response/Action] For <fac> where <class> is irrelevant(SC, FD): +CLCK=<fac>,2 +CLCK: <status></p> <p>For <fac> with several supported <class>es: +CLCK=<fac>,2 +CLCK: <status>,<class1></p> <p>[<CR><LF> +CLCK: <status>,<class2></p> <p>[...] OK</p>
Read	N/A
Test	[Function]


Command	Description
	<p>The Test command returns the list of supported facilities.</p> <p>[Syntax] AT+CLCK=?</p> <p>[Response/Action] +CLCK: (list of supported <fac>s) OK</p>
Parameters	<p><fac> Please see <fac> Table in +CPWD command.</p> <p><passwd> String type, 4-8 character password. Shall be the same as password specified for the facility with command Change Password +CPWD</p> <p><mode></p> <ul style="list-style-type: none"> 0 Unlock 1 Lock 2 Query status (<passwd> does not apply) <p> Note: Query mode return only the active <fac>. In case no <fac> is active the query will return the default (7).</p> <p><class> Sum of integers, each representing a class of information. Please see class table in +CCWA command. The default value is 7.</p> <p><status></p> <ul style="list-style-type: none"> 0 Inactive 1 Active
Example	<pre>AT+CLCK=? +CLCK: ("AO","OI","AI","IR","OX","AB","AG","AC","PS","PN","PU","PP","PC","SC","FD") OK AT+CLCK="SC",2 +CLCK: 0 OK AT+CLCK="SC",1 +CME ERROR: operation not allowed AT+CLCK="SC",1,"incorrect password"</pre>

Command	Description
	<p>+CME ERROR: incorrect password</p> <p>AT+CLCK="SC",1,"correct password"</p> <p>OK</p> <p>(From now SIM Card is locked and PIN is requested on power up)</p> <p>AT+CLCK="AB",0,"incorrect password"</p> <p>+CME ERROR: incorrect password</p> <p>AT+CLCK="IR",2</p> <p>+CLCK: 0,1</p> <p>+CLCK: 0,2</p> <p>+CLCK: 0,4</p> <p>+CLCK: 0,8</p> <p>OK</p> <p>AT+CLCK="IR",1,"correct password" //<classx> is defaulted to 7 when not specified</p> <p>OK</p> <p>AT+CLCK="IR",2</p> <p>+CLCK: 1,1</p> <p>+CLCK: 1,2</p> <p>+CLCK: 1,4</p> <p>+CLCK: 0,8</p> <p>OK</p> <p>AT+CLCK="OI",1,"correct password",3</p> <p>OK</p> <p>(Voice and data international calls barred, fax and SMS not barred.)</p> <p>AT+CLCK="OI",2</p> <p>+CLCK: 1,1</p> <p>+CLCK: 1,2</p> <p>+CLCK: 0,4</p> <p>+CLCK: 0,8</p> <p>OK</p>
Reference	3GPP TS 27.007

8.1.6 +CPINR, Remaining PIN Retries

Set command cause the MT to return the number of remaining PIN retries for the MT passwords with intermediate result code +CPINR: <cod>,<retries>[,<default_retries>] for standard PINs. One line with one intermediate result code is returned for every <cod> selected by <sel_code>. When execution command is issued without the optional parameter <sel_code>, intermediate result codes are returned for all <cod> s. In the intermediate result codes, the parameter <default_retries> is an optional (manufacturer specific) parameter, per <cod>.

Command	Description
Set	<p>[Function] The Set command cause the MT to return the number of remaining PIN retries for the MT passwords.</p> <p>[Syntax] AT+CPINR[=<sel_code>]</p> <p>[Response/Action] OK Or +CME ERROR: <err></p>
Read	N/A
Test	<p>[Function] The Test command only returns OK.</p> <p>[Syntax] AT+CPINR=?</p> <p>[Response/Action] OK</p>
Parameters	<p><retries>: integer type. Number of remaining retries per PIN.</p> <p><default_retries>: integer type. Number of default/initial retries per PIN.</p> <p><sel_code>: String type. Same values as for the <cod> parameters. These values are strings and</p>

Command	Description
	<p>shall be indicated within double quotes. It is optional to support wildcard match by "", meaning match any (sub-)string.</p> <p><cod>: Type of PIN. All values listed under the description of the AT+CPIN command, <cod> parameter, except 'READY'.</p> <p>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></p> <p> Notes:</p> <ul style="list-style-type: none"> . If <retries> and <default_retries> values are -1, then the retrial method is TIME_LIMI T_SEPARATION. So the <retries> and <default_retries> values are insignificant. . This command is supported only from release 10. . +CPINRE intermediate result code is not supported, as currently there are no manufac-turer specific PINs. . Following wildchar patterns are supported: "SIM*", "SIM PUK*", "SIM PIN*"
Example	<pre>AT+CPINR="SIM*" +CPINR: SIM PIN,3,3 +CPINR: SIM PUK,6,10 +CPINR: SIM PIN2,2,3 +CPINR: SIM PUK2,10,10 OK AT+CPINR="SIM PIN" +CPINR: SIM PIN,2,3 OK AT+CPINR="SIM PUK" +CPINR: SIM PUK,10,10 OK AT+CPINR="SIM PIN2" +CPINR: SIM PIN2,3,3 OK</pre>

Command	Description
	AT+CPINR="SIM PUK2" +CPINR: SIM PUK2,10,10 OK AT+CPINR="SIM PIN*" +CPINR: SIM PIN,2,3 +CPINR: SIM PIN2,3,3 OK AT+CPINR=? OK
Reference	3GPP TS 27.007

9 Network

9.1 Network Commands

9.1.1 +CSQ, Signal Strength

This command displays the received signal strength indication <rss> and channel bit error rate <ber> from the Modem.


Command	Description
Set	<p>[Function] This command displays the received signal strength indication <rss> and channel bit error rate <ber> from the Modem.</p> <p>[Syntax] AT+CSQ</p> <p>[Response/Action] +CSQ: <rss>,<ber> OK</p>
Read	<p>[Function] This command displays the received signal strength indication <rss> and channel bit error rate <ber> from the Modem.</p>


Command	Description
	<p>[Syntax] AT+CSQ?</p> <p>[Response/Action] +CSQ: <rss>,<ber></p> <p>OK</p>
Test	<p>[Function] This command returns the range of signal strength indication value and channel bit error rate value.</p> <p>[Syntax] AT+CSQ=?</p> <p>[Response/Action] +CSQ: (list of supported <rss>),(list of supported <ber>)</p> <p>OK</p>
Parameters	<p><rss> 0 through 31 - covers the range of -113 dbm (or less) to -51 dbm (or greater)</p> <p>0 - 113 dBm or less</p> <p>1 - 111 dBm</p> <p>2...30 -109... -53 dBm</p> <p>31 - 51 dBm or greater</p> <p>99 not known or not detectable</p> <p><ber> Channel bit error rate (in percent)</p> <p>0-7 RXQUAL values in the TS 45.008 table</p> <p>99 Unknown or not detectable</p>
Example	<p>AT+CSQ</p> <p>+CSQ: 23,99</p> <p>OK</p> <p>AT+CSQ=?</p> <p>+CSQ: (0-31,99),(0-7,99)</p> <p>OK</p>
Reference	3GPP TS 27.007

9.1.2 +CESQ, Extended Signal Quality

This command display the received signal quality parameters.

Command	Description
Set	<p>[Function] 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, <rscp> and <ecno> are set to 255. If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.</p> <p>[Syntax] AT+CESQ</p> <p>[Response/Action] +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> OK or CME ERROR: <error></p>
Read	N/A
Test	<p>[Function] Test command returns values supported as compound values.</p> <p>[Syntax] AT+CESQ=?</p> <p>[Response/Action] +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) OK</p>
Parameters	<p><rxlev>: Integer type. Received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).</p> <p>0 rssi < -110 dBm 1 -110 dBm <= rssi < -109 dBm 2 -109 dBm <= rssi < -108 dBm :::</p>

Command	Description
61	-50 dBm <= rssi < -49 dBm
62	-49 dBm <= rssi < -48 dBm
63	-48 dBm <= rssi
99	not known or not detectable
	<ber>:
	Integer type. Channel bit error rate (in percent).
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 type. 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).
0	rscp < -120dbm
1	-120 dBm <= rscp < -119 dBm
2	-119 dBm <= rscp < -118 dBm
:::	
94	-27 dBm <= rscp < -26 dBm
95	-26 dBm <= rscp < -25 dBm
96	-25 dBm <= rscp
255	not known or not detectable
	 Note:
	Values between -115dbm and -120dbm will all be represented by level 0.
	<ecno>:
	Integer type. Ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause).
0	Ec/lo < -24 dB
1	-24 dB <= Ec/lo < -23.5 dB
2	-23.5 dB <= Ec/lo < -23 dB
:::	
47	-1 dB <= Ec/lo < -0.5 dB
48	-0.5 dB <= Ec/lo < 0 dB
49	0 dB <= Ec/lo
255	not known or not detectable
	<rsrq>:

Command	Description
	<p>Integer type. Reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7).</p> <p>0 rsrq < -19.5 dB</p> <p>1 -19.5 dB <= rsrq < -19 dB</p> <p>2 -19 dB <= rsrq < -18.5 dB</p> <p>:::::</p> <p>32 -4 dB <= rsrq < -3.5 dB</p> <p>33 -3.5 dB <= rsrq < -3 dB</p> <p>34 -3 dB <= rsrq</p> <p>255 not known or not detectable</p> <p><rsrp>:</p> <p>Integer type. Reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4).</p> <p>0 rsrp < -140 dBm</p> <p>1 -140 dBm <= rsrp < -139 dBm</p> <p>2 -139 dBm <= rsrp < -138 dBm</p> <p>:::::</p> <p>95 -46 dBm <= rsrp < -45 dBm</p> <p>96 -45 dBm <= rsrp < -44 dBm</p> <p>97 -44 dBm <= rsrp</p> <p>255 not known or not detectable</p> <p> Note: This command is supported only from release 10.</p>
Example	<pre>AT+COPS? +COPS: 0,0,"CHN-UNICOM",7 OK AT+CESQ +CESQ: 99,99,255,255,20,29 OK</pre>
Reference	3GPP TS 27.007

9.1.3 +CRLP, Radio Link Protocol

This command is used to change the Radio Link Protocol(RLP) parameters used when non-transparent data calls are originated.

Command	Description
Set	<p>[Function] The Set command is used to change the radio link protocol parameters.</p> <p>[Syntax] AT+CRLP=[<iws>,<mws>[,<T1>[,<N2>]]]]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Returns the current CRLP settings</p> <p>[Syntax] AT+CRLP?</p> <p>[Response/Action] +CRLP= <iws>,<mws>,<T1>,<N2> OK</p>
Test	<p>[Function] This command returns the list of supported values.</p> <p>[Syntax] AT+CRLP=?</p> <p>[Response/Action] +CRLP= (list of supported <iws>s),(list of supported <mws>s), (list of supported <T1>s), (list of supported<N2>s) OK</p>
Parameters	<p><iws> IWF to MS window size. 0-61. The default value is 61.</p> <p><mws> MS to IWF window size. 0-61.</p>

Command	Description
	<p>The default value is 61.</p> <p><T1> Acknowledgement timer T1. 39-255.</p> <p>The default value is 48.</p> <p><N2> Retransmission attempts N2 in integer format (refer to GSM 04.22 subclause5.4.3)</p> <p>The default value is 6.</p>
Example	<pre>AT+CRLP=? +CRLP: (0-61),(0-61),(39-255),(1-255) OK AT+CRLP? +CRLP: 61,61,48,6 OK</pre>
Reference	3GPP TS 27.007

9.1.4 +CREG, Network Registration Status

This command controls the presentation of an unsolicited result code +CREG and provides the information of network registration status.

Set command is used to control the unsolicited result code +CREG. The syntax of unsolicited result +CREG as mentioned below:

1. +CREG:<stat> when <n>=1 and there is a change in the MT's circuit mode network registration status in GERAN/UTRAN/E-UTRAN.
2. +CREG:<stat> [,<lac>,<ci>[<,<AcT>]] when <n>=2 and there is a change of the network cell cell in GERAN/UTRAN/E-UTRAN in this case <AcT>,<lac> and <ci> are sent only is available
3. +CREG: <stat> [, <lac>,<ci>[,<AcT>[,<reject type>[,<reject cause>]]]] when <n>=3.




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<AcT>,<lac> and <ci> are returned only, if available,when <n>=2 and MT is registered in the network.

Test command returns the range of supported modes(i.e.<n>s)

Command	Description
Set	<p>[Function]</p> <p>The Set command controls the presentation of an unsolicited result code and the result</p>

Command	Description
	<p>of the Read operation.</p> <p>[Syntax] AT+CREG=[<n>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command returns the status of the result code presentation whether the network has indicated the registration of Modem.</p> <p>[Syntax] AT+CREG?</p> <p>[Response/Action] +CREG: <n>,<stat> [, <lac>,<ci>[,<AcT>[,<reject type>[,<reject cause>]]]] OK</p>
Test	<p>[Function] Test command returns the range of supported modes.</p> <p>[Syntax] AT+CREG=?</p> <p>[Response/Action] +CREG: (list of supported <n>s) OK</p>
Parameters	<p><n></p> <p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited reports and Read command +CREG: <stat>[,<lac>,<ci>[,<AcT>]].</p> <p>3 Enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[,<lac>],<ci>[,<AcT>][,<cause_type>,<reject_cause>]].</p>

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Command	Description
	<p>The default value is 0.</p> <p> Note: n=3 just supported by L810-GL-00,L830-EA-00,L830-GL-00.</p> <p><stat></p> <p>0 Not registered, and the ME is not currently searching for a new operator to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p> <p>6 Registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)</p> <p>7 registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)</p> <p>8 attached for emergency bearer services only (see Note) (not applicable)</p> <p> Note: 3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services</p> <p><lac> string type; two byte location area code (when <AcT> indicates value 0 to 6), or tracking area code (when <AcT> indicates value 7). In hexadecimal format (e.g. "00C3").</p> <p><ci>string type; ; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format (e.g. "0000A13F")</p> <p><AcT></p> <p>0 GSM</p> <p>2 UTRAN</p> <p>3 GSM w/EGPRS</p> <p>4 UTRAN w/HSDPA</p> <p>5 UTRAN w/HSUPA</p> <p>6 UTRAN w/HSDPA and HSUPA</p> <p>7 E-UTRAN</p> <p> Note: <Act> is supporting from R7 and above Protocol Stack. 3GPP TS 44.060 [71]</p>

Command	Description
	<p>specifies the System Information messages which give the information about whether the serving cell supports EGPRS. 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.</p> <p><reject type> integer type; indicates the type of <reject_cause>.</p> <p>0 Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G.</p> <p>1 Indicates that <reject_cause> contains a manufacturer specific cause.</p> <p><reject cause> integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p>
Example	<pre> AT+CREG=? +CREG: (0-2) OK AT+CREG? +CREG: 0,1 OK AT+CREG=2 OK AT+CREG? +CREG: 2,1,"A52F","01603413",6 OK AT+CREG=1 OK AT+CREG? +CREG: 1,1 OK AT+CREG=0 OK </pre>
Reference	3GPP TS 27.007

9.1.5 WS46, Select Wireless Network

This command is used to configure the RAT.

Command	Description
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Command	Description
Set	<p>[Function] Set command is used to set the Rat.</p> <p>[Syntax] AT+WS46=[<n>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Read Command reads the current RAT.</p> <p>[Syntax] AT+WS46?</p> <p>[Response/Action] +WS46: (Current value of <n>) OK</p>
Test	<p>[Function] Test command returns the list of supported RATs.</p> <p>[Syntax] AT+WS46=?</p> <p>[Response/Action] +WS46: (list of supported <n>s) OK</p>
Parameters	<p><n>:Integer type <n> value of set command 12 3GPP System (GERAN, UTRAN and E-UTRAN) for triple mode stack. Preferred Network selection will be based on the highest network generation, in the order of E-UTRAN, UTRAN and GERAN.</p>

Command	Description
	22 same as 12 25 same as 12 28 same as 12 29 same as 12 30 same as 12 31 same as 12 <n> value for read command 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
Example	<pre>AT+WS46=? +WS46: (12,22,25,28,29,30,31) OK AT+WS46? +WS46: 25 OK</pre>
Reference	3GPP TS 27.007

9.1.6 +CGREG, GPRS Network Registration



This command gives the information of state of GPRS network registration. This set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status GERAN/UTRAN, or code +CGREG: <stat>[,<lac>,<ci>] [,<AcT>,<rac>] when <n>=2 and there is a change in the network cell in GERAN/UTRAN; in this case <AcT>, <lac>, <rac> and <ci> are sent only if available. code +CGREG: <stat>[,<lac>[,<ci>[,<AcT>[,<rac>[,<reject type>[,<reject cause>]]]]]] when <n>=3.


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

<lac>, <ci>, <AcT> and <rac>, if available, are returned only when <n>=2 and MT is registered in the network.

Test command returns the range of supported network registration mode (i.e. <n>).

Command	Description
Set	<p>[Function] The Set command controls the presentation of an unsolicited result code "+CGREG: " and the result of the Read operation.</p> <p>[Syntax] AT+CGREG=<n></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] 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.</p> <p>[Syntax] AT+CGREG?</p> <p>[Response/Action] +CGREG: <n>, <stat>[,<lac>[,<ci>[,<AcT>[,<rac>[,<reject type>[,<reject cause>]]]]]]] OK</p>
Test	<p>[Function] The Test command displays the supported values of <n>.</p> <p>[Syntax] AT+CGREG=?</p> <p>[Response/Action] +CGREG: (list of supported <n>s) OK</p>

Command	Description
Parameters	<p><n></p> <p>0 Disables the network registration unsolicited result code.</p> <p>1 Enables the network registration unsolicited result code +CGREG: <stat>.</p> <p>2 Enables the network registration and location information in unsolicited result code and Read command +CGREG: <stat>[,<lac>,<ci>].</p> <p>3 Enable network registration, location information and GMM cause value information unsolicited result code</p> <p>+CGREG: <stat>[,<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]].</p> <p> Note:</p> <p>n=3 just supported by L810-GL-00,L830-EA-00,L830-GL-00.</p> <p>The default value is 0.</p> <p><stat></p> <p>0 Not registered, and the ME is not currently searching for a new operator to register.</p> <p>1 Registered, home network.</p> <p>2 Not registered, but the ME is currently searching for a new operator to register.</p> <p>3 Registration denied.</p> <p>4 Unknown.</p> <p>5 Registered, roaming.</p> <p>6 registered for "SMS only",home network (not applicable)</p> <p>7 registered for "SMS only", roaming (not applicable)</p> <p>8 attached for emergency bearer services only (see Note 2) (applicable only when <AcT> indicates 2,4,5,6).</p> <p> Note:</p> <p>3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services.</p> <p><lac> string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><ci>string type ; four byte GERAN/UTRAN cell ID in hexadecimal format</p> <p><AcT> It is a Release 7 feature and describes access technology of the registered network. Possible values of <AcT> are:</p> <p>0 GSM</p> <p>1 GSM Compact</p>

Command	Description
	<p>2 UTRAN 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA 7 E-UTRAN</p> <p> Note: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.</p> <p><rac> is Release 7 feature, string type; one byte routing area code in hexadecimal format</p> <p><reject type> integer type; indicates the type of <reject_cause>.</p> <p>0 Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G.</p> <p>1 Indicates that <reject_cause> contains a manufacturer specific cause.</p> <p><reject cause> integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p>
Example	<pre>at+cgreg=? +CGREG: (0-2) OK AT+CGREG=2 OK AT+CGREG? +CGREG: 2,1,"A52F","0160358F",6,"02" OK AT+CGREG=1 OK AT+CGREG? +CGREG: 1,1 OK AT+CGREG=0 OK</pre>

Command	Description
Reference	3GPP TS 27.007

9.1.7 +CEREG, EPS Network Registration status

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, or code +CEREG:<stat>,<tac>,<ci>,<AcT>]] when <n>=2 and there is a change of the network cell, code +CEREG:<stat>,<tac>,<ci>,<AcT>,<reject type>,<reject cause>]]]]]] when <n>=3.



Note1:

If the EPS MT 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.

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.


Test command returns the range of supported network registration mode (i.e. <n>).





Note:

This command is supported only in R8 protocol with LTE.

Command	Description
Set	<p>[Function] The Set command controls the presentation of an unsolicited result code "+CEREG: " and the result of the Read operation.</p> <p>[Syntax] AT+CEREG=[<n>]</p> <p>[Response/Action] OK Or +CME ERROR: <err></p>
Read	<p>[Function]</p> <p>[Syntax] AT+CEREG?</p>

Command	Description
	<p>[Response/Action] +CEREG: <n>,<stat>[,<tac>[,<ci>[,<AcT>[,<reject type>[,<reject cause>]]]]] OK</p>
Test	<p>[Function] The Test command displays the supported values of <n>.</p> <p>[Syntax] AT+CEREG=?</p> <p>[Response/Action] +CEREG: (list of supported <n>s) OK</p>
Parameters	<p><n> 0 disable network registration unsolicited result code (default) 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 and location information unsolicited result code +CEREG: <stat>[,<tac>[,<ci>[,<AcT>[,<reject type>[,<reject cause>]]]]]</p> <p> Note: n=3 just supported by L810-GL-00,L830-EA-00,L830-GL-00.</p> <p><stat> EPS registration status 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 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) (applicable only when <AcT> indicates 2,4,5,6).</p>

Command	Description
	<p> 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.</p> <p><tac> string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><ci>string type; four byte E-UTRAN cell ID in hexadecimal format</p> <p><AcT> access technology of the serving cell</p> <p>0 GSM (not applicable)</p> <p>1 GSM Compact (not applicable)</p> <p>2 UTRAN (not applicable)</p> <p>3 GSM w/EGPRS (see Note 3) (not applicable)</p> <p>4 UTRAN w/HSDPA (see Note 4) (not applicable)</p> <p>5 UTRAN w/HSUPA (see Note 4) (not applicable)</p> <p>6 UTRAN w/HSDPA and HSUPA (see Note 4) (not applicable)</p> <p>7 E-UTRAN</p> <p> Note 3: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.</p> <p>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.</p> <p><reject type> integer type; indicates the type of <reject_cause>.</p> <p>0 Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G.</p> <p>1 Indicates that <reject_cause> contains a manufacturer specific cause.</p> <p><reject cause> integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p>
Example	<pre>AT+CEREG=? +CEREG: (0-3) OK AT+CEREG=2 OK AT+CEREG? +CEREG: 2,1,"247B","0A7D7B01",7</pre>

Command	Description
	OK AT+CEREG=0 OK
Reference	3GPP TS 27.007

9.1.8 +COPS, Operator Selection

This command enables accessories to access the network registration information, and the selection and registration of the GSM/UMTS network operator.

The Modem is registered in the Home network.

The Enhanced Operator Name String (EONS) feature enables the Modem to return the operator name displayed on the handset.

This feature allows the SIM card to store a mapping of MCC/MNC code pairs to the displayed operator name. As a result, several operators can share a single network while having their handsets display their own name as the network operator.

Testing the enhanced ONS feature requires a "SIM ONS" SIM card.

Command	Description
Set	<p>[Function]</p> <p>The Set command can force an attempt to select and register a specific GSM network operator. The <mode> selects whether this is done automatically by the Modem or whether the selection is forced to an operator <oper> (given in format <format>). If the selected operator is not available, no other operator is selected (except when the <mode> is set to 4).</p> <p><mode>=2 forces an attempt to deregister from the network.</p> <p><mode>=3 sets the operator format to all further Read commands (+COPS?) as well.</p> <p>The selected mode applies to future network registrations, for example, once you deregister from the network, the Modem remains unregistered until you select <mode>=0, <mode>=1, or <mode>=4</p> <p>[Syntax]</p> <p>AT+COPS=[<mode>[,<format>[,<oper>[,<AcT>]]]]</p> <p>[Response/Action]</p> <p>OK</p>

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Command	Description
	or: +CME ERROR: <err>
Read	<p>[Function] The Read command returns the current mode and the currently selected operator.</p> <p>[Syntax] AT+COPS?</p> <p>[Response/Action] +COPS: <mode>[,<format>,<oper>[,< AcT>]] OK Or +CME ERROR: <err></p>
Test	<p>[Function] The Test command returns a list of quadruplets, each representing an operator present in the network. A quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. If any of the formats are unavailable, there is an empty field. The list of operators is in the following 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. After the operator list, the Modem returns lists of the supported <mode>s and <format>s. These lists are separated from the operator list by two commas.</p> <p>[Syntax] AT+COPS=?</p> <p>[Response/Action] +COPS: [list of supported (<stat>, long alpha numeric <oper>,short alphanumeric<oper>, numeric<oper>)][,list of supported <AcT> [,list of supported <mode>s,(list of supported<format>s)]] OK</p>
Parameters	<mode> Determines whether what is displayed is defined by <oper>, or is done

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Command	Description
	<p>automatically by the Modem.</p> <p>0 Automatic (<oper> field is ignored)</p> <p>1 Manual (<oper> field is present)</p> <p>2 De-register from network</p> <p>3 Set only <format> (<oper> field is ignored); used for Read command only, do not attempt registration/deregistration</p> <p>4 Manual/automatic (<oper> field is present; if manual selection fails, use automatic mode)</p> <p>The default value is 0.</p> <p><format> The operator format type:</p> <p>0 Long alphanumeric</p> <p>1 Short alphanumeric</p> <p>2 Numeric</p> <p>The default value is 0.</p> <p><stat> 0 Unknown</p> <p>1 Available</p> <p>2 Current</p> <p>3 Forbidden</p> <p><oper> Operator name displayed.</p> <p>The long alphanumeric format can be up to 16 characters long. The short alphanumeric format can be up to 8 characters long.</p> <p>The numeric format is the GSM Location Area Identification number (refer to GSM 04.08 subclause 10.5.1.3), consisting of a three BCD digit country code (as per ITU-T E.212 Annex A), plus a two BCD digit network code, which is administration specific.</p> <p>The returned <oper> is not in BCD format, but in IRA characters converted from BCD, and therefore the number has the following structure:</p> <p>(country code digit 3) (country code digit 2) (country code digit 1) (network code digit2) (network code digit 1)</p> <p><AcT> Indicates the radio access technology and values can be:</p> <p>0 GSM</p> <p>2 UMTS/TDS-CDMA</p> <p>7 LTE</p> <p><plmn_list> Indicates whether the PLMN is present on the EHPLMN list, the User</p>

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Command	Description
	Controlled PLMN List or the Operator Controlled PLMN List. 0 PLMN is present on the EHPLMN list 1 PLMN is present on the User Controlled PLMN List 2 PLMN is present on the Operator Controlled PLMN List
Example	<pre> AT+COPS=? +COPS: (2,"CHN-UNICOM","UNICOM","46001",2),(2,"CHN-UNICOM","UNICOM","46001",0),(3,"CHINA MOBILE","CMCC","46000",0,) OK AT+COPS? +COPS: 1,0,"CHN-UNICOM",2 OK AT+COPS=2 OK AT+CREG=2 OK +CREG: 3 AT+COPS=4,2,"46001" +CREG: 3 +CREG: 2 +CREG: 1,"27A0","0DEB" OK AT+COPS? +COPS: 1,2,"46001",2 OK </pre>
Reference	3GPP TS 27.007

9.1.9 +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.

Command	Description
Set	[Function] Set command selects a list in the SIM/USIM.

Command	Description
	<p>[Syntax] AT+CPLS= [<cpls_list>]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Read command returns the selected PLMN selector list from the SIM/USIM.</p> <p>[Syntax] AT+CPLS?</p> <p>[Response/Action] +CPLS: <cpls_list> OK</p>
Test	<p>[Function] Test command returns the whole index range supported lists by the SIM/USIM.</p> <p>[Syntax] AT+CPLS=?</p> <p>[Response/Action] +CPLS: (0-2) OK</p>
Parameters	<p><cpls_list></p> <p>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)</p> <p>1 Operator controlled PLMN selector with Access Technology EFOPLMNwAcT</p> <p>2 HPLMN selector with Access Technology EFHPLMNwAcT</p>
Example	<p>AT+CPLS=?</p> <p>+CPLS: (0-2)</p>

Command	Description
	OK AT+CPLS? +CPLS: 0 OK
Reference	3GPP TS 27.007


9.1.10 +CPOL, Preferred Operators

This command is used to edit the PLMN selector lists in the SIM card or active application in the UICC (GSM or USIM).

If no list has been previously selected, the EFPLMNwAcT - user controlled PLMN selector with Access Technology list, is the one accessed by default.

Command	Description
Set	<p>[Function]</p> <p> Note: In case the index already exists in the list, the new entry will erase the old one and replace it in the list.</p> <p>The Modem may also update this list automatically when new networks are selected.</p> <p>[Syntax] AT+CPOL=[<index>],[<format>],[<oper>],[<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]</p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function]</p> <p>This command returns the current values.</p> <p>[Syntax] AT+CPOL?</p> <p>[Response/Action] +CPOL:</p>

Command	Description
	<p><index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<UTRAN_AcT1>][<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<UTRAN_AcT1>] [...]]</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
Test	<p>[Function]</p> <p>The Test command displays the entire index range supported by the SIM.</p> <p>[Syntax]</p> <p>AT+CPOL=?</p> <p>[Response/Action]</p> <p>+CPOL: (list of supported<index>s),(list of supported<format>s)</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p> <p>* Index range is SIM dependent</p>
Parameters	<p><indexn> Order number of network operator in the SIM preferred operator list</p> <p><format> Defines the <oper> format:</p> <p>0 Long alphanumeric format (up to 16 characters) (default)</p> <p>1 Short alphanumeric format (up to 8 characters)</p> <p>2 Numeric</p> <p><oper> Name of the network operator string type; <format> indicates if the format is alphanumeric or numeric (see +COPS)</p> <p><GSM_AcTn> GSM access technology</p> <p>0 access technology not selected</p> <p>1 access technology selected</p> <p><GSM_Compact_AcTn> GSM compact access technology</p> <p>0 access technology not selected</p> <p>1 access technology selected</p> <p><UTRA_AcTn> UTRA access technology</p> <p>0 access technology not selected</p> <p>1 access technology selected</p>


Command	Description
	<p><EUTRAN_Act> EUTRAN access technology</p> <p>0access technology not selected</p> <p>1access technology selected</p> <p> Note1:</p> <ul style="list-style-type: none"> • 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. <p>Note2:</p> <ul style="list-style-type: none"> • User is prevented from editing index No. 0. This index is reserved for the HPLMN record and can not be modified. <p>Note3: MT may also update the User controlled PLMN selector with Access Technology list - EFPLMNwAct, automatically when new networks are selected.</p> <p>Note4: The Operator controlled PLMN selector with Access Technology EFOPLMNwAct and HPLMN selector with Access Technology - EFHPLMNwAct can not be written since the access conditions is Administrative.</p> <p>Note5: The command is implemented according to 3GPP TS 27.007 without acceptance in attention the <GSM_Act2>, <GSM_Compact_Act2>, <UTRAN_Act2>] bits since the Modem device not using this bits to get the best PLMN.</p>
Example	<pre> AT+CPOL=? +CPOL: (1-8),(0-2) OK AT+CPOL? +CPOL: 1,0,"CHN-UNICOM",0,0,1,0 OK AT+CPOL=,2 OK </pre>

Command	Description
	AT+CPOL? +CPOL: 1,2,"46001",0,0,1,0 OK
Reference	3GPP TS 27.007

9.1.11 +COPN, Read Operator Names

This Execution command returns the list of operator names from the ME. Each operator code <numeric_n> that has an alphanumeric equivalent <alpha_n> in the ME memory shall be returned.


Command	Description
Set	<p>[Function] This command returns the list of operator names from the ME.</p> <p>[Syntax] AT+COPN</p> <p>[Response/Action] +COPN: <numeric 1>,<alpha1> [<CR><LF> +COPN: <numeric2>,<alpha2>[...]] OK or CME ERROR: <error></p>
Read	N/A
Test	<p>[Function] This command only returns OK.</p> <p>[Syntax] AT+COPN=?</p> <p>[Response/Action] OK</p>
Parameters	<p><numeric n> string type; operator in numeric format (see +COPS)</p>

Command	Description
	<p><alpha n> string type; operator in long alphanumeric format (see +COPS)</p> <p> Note : If matching PLMN name is not found then numeric PLMN id (MCCMNC) will be displayed</p>
Example	<pre>AT+COPN +COPN: "20201","GR COSMOTE" +COPN: "20205","vodafone GR" +COPN: "20209","WIND GR" ... +COPN: "90121","Seanet" +COPN: "90126","TIM@sea" OK</pre>
Reference	3GPP TS 27.007

9.1.12 +CEMODE, UE modes of operation for EPS

This command is used to set the MT to operate according to the specified mode of operation for EPS.

Command	Description
Set	<p>[Function] 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].</p> <p>[Syntax] AT+CEMODE=[<mode>]</p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] The read command returns the mode of operation set by the TE.</p>

Command	Description
	<p>[Syntax] AT+CEMODE?</p> <p>[Response/Action] +CEMODE : <mode> OK</p>
Test	<p>[Function] The test command is used for requesting information on the supported MT mode of operation.</p> <p>[Syntax] AT+CEMODE=?</p> <p>[Response/Action] +CEMODE: (list of supported <mode>s) OK</p>
Parameters	<p><mode>: a numeric parameter which indicates the mode of operation 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</p> <p> Note: The definition for UE modes of operation can be found in 3GPP TS 24.301 [83] Other values are reserved and will result in an ERROR response to the set command. For L830-GL-01: The default setting of <mode> is 1. For L810-GL-00,L811-EA-00,L830-EA-00,L830-GL-00,L831-EA-00/01: The default setting of <mode>is 2.</p>
Example	<p>AT+CEMODE=? +CEMODE: (0-3) OK AT+CEMODE? +CEMODE: 2</p>

Command	Description
	OK AT+CEMODE=1 OK AT+CEMODE? +CEMODE: 1 OK
Reference	3GPP TS 27.007

9.1.13+XMCI, Measured Cell Information

This command is used to read the measured cells information available at access stratum (AS) at the point of time the request is sent. Both serving cell & neighboring cell information is provided in response. Test command always returns OK.

Command	Description
Set	<p>[Function] Set command selects Measurement type.</p> <p>[Syntax] AT+ XMCI = [<meas>]</p> <p>[Response/Action] For <Type> value 0 and 1 +XMCI:<TYPE>,<MCC>,<MNC>,<LAC>,<CI>,<BSIC>,<RXLEV>,<BER>,<ARFCN>,<TARELIABILITY>,<TA> For <Type> value 2 and 3 +XMCI:<TYPE>,<MCC>,<MNC>,<LAC>,<CI><PSC>,<DLUARFNC>,<ULUARFCN>,<PATHLOSS>,<RSSI>,<RSCP>,<ECNO> For <Type> value 4 and 5 +XMCI:<TYPE>,<MCC>,<MNC>,<TAC>,<CI>,<PCI>,<DLUARFNC>,<ULUARFCN>,<PATHLOSS_LTE>,<RSRP>,<RSRQ>,<RSSNR>,<TA>,<CQI> For <Type> value 6 and 7 +XMCI: <TYPE>,<sid>,<nid>,<base_station_id>,<pilot_pn>,<base_lat>,<base_long>,<gps_sec>,<gps_week> For <Type> value 8 and 9</p>

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Command	Description
	+XMCI: <TYPE>,<sector_id>,<pilot_pn>,<base_lat>,<base_long>,<gps_sec>,<gps_week> OK
Read	N/A
Test	<p>[Function] Test command returns list of supported Measurement type.</p> <p>[Syntax] AT+ XMCI =?</p> <p>[Response/Action] + XMCI: (list of supported <meas>s) OK</p>
Parameters	<p><meas>: Integer type. Measurement type.</p> <p>0 All available information regarding measured cells (Serving, IntraRAT and Inter-RAT neighboring Cells (default)) 1 Fresh Serving Cell Measurements and All available information regarding measured neighboring cells (Intra-RAT, Inter-RAT)</p> <p><TYPE>: Integer type. Type of cell.</p> <p>0 GSM serving cell 1 GSM neighboring cell 2 UMTS serving cell 3 UMTS neighboring cell 4 LTE Serving Cell 5 LTE Neighboring cell 6 1xRTT Serving Cell 7 1xRTT Neighboring cell 8 EvDO Serving Cell 9 EvDO Neighboring cell</p>
Example	AT+ XMCI=1 +XMCI:

Command	Description
	4,460,01,"0x910C","0x00982D97","0x01EF","0x00000672","0x00004CC2","0xFFFFFFFF",29,0,-24,"0x00000003","0x00000000" OK AT+ XMCI=? +XMCI: (0,1) OK
Reference	

9.1.14 +XCCINFO, Camped Cell Information

This command shall be used to enable/disable the unsolicited response which informs about any change in camped cell parameters.

Command	Description
Set	<p>[Function] Set command enables/disables unsolicited camped cell parameter change event notifications.</p> <p>[Syntax] AT+XCCINFO=<mode></p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] Read command returns Camped Cell Information.</p> <p>[Syntax] AT+XCCINFO?</p> <p>[Response/Action] +XCCINFO: <mode>,<mcc>,<mnc>,<ci>,<rat>,<band_info>,<lac>,<area_type>,<rac>,<tac>,<eutra_detected>,<network_op_mode>,<is_gprs_available>,<is_edge_available>,<is_dtm_a_vailable>,<is_hsdpa_available>,<is_hsupa_available>,<is_cb_available> OK or CME ERROR: <error></p>

Command	Description
Test	<p>[Function] Test command returns list of supported <mode>s.</p> <p>[Syntax] AT+XCCINFO=?</p> <p>[Response/Action] +XCCINFO: (list of supported modes) OK or CME ERROR: <error></p>
Parameters	<p><mode></p> <p>Integer type 1: camped cell parameters change event notification is enabled 0: camped cell parameters change event notification is disabled</p>
Example	<p>AT+XCCINFO=1 OK AT+XCCINFO? +XCCINFO: 1,460,01,"00982D97",3,103,"FFFF",1,"FF","910C",0,0,0,0,0,0,0 OK AT+XCCINFO=? +XCCINFO: (0,1) OK</p>
Reference	

9.1.15 +XGAUTH, Set Type of Authentication

This proprietary command allows to enter the type of authentication for a user-name(using a password) for the specified PDP context.

Command	Description
Set	<p>[Function] Set command allows to enter the type of authentication for a user-name (using a password) for the specified PDP context.</p> <p>[Syntax]</p>

Command	Description
	AT+XGAUTH=<cid>,<auth>,<name>,<pwd> [Response/Action] OK or CME ERROR: <error>
Read	N/A
Test	[Function] Test command returns (list of supported <cid>s),(list of supported <auth>s),lname,lpwd. [Syntax] AT+XGAUTH=? [Response/Action] +XGAUTH: (0-29),(0-2),64,64 ie..(list of supported <cid>s),(list of supported <auth>s),lname,lpwd OK
Parameters	<cid> PDP context identifier <auth> authentication may be: 0 meaning authentication protocol not used (NONE: see also 2.1 <APN>)(default) 1 meaning personal authentication protocol (PAP: see also 2.1 <APN>) 2 meaning handshake authentication protocol (CHAP: see also 2.1 <APN>) <name> user name as string with length <lname> <pwd> password as string with maximum length <lpwd>
Example	AT+XGAUTH=0,1,"GSM","1234" OK
Reference	

9.1.16 +XLEC, LTE Extended Cell info

This command is used to enable or disable LTE Cell info URC.


Command	Description
Set	<p>[Function] Set command is used to enable or disable URC +XLECI.</p> <p>[Syntax] AT+XLEC=[<n>]</p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] Read command returns the value of <n>.</p> <p>[Syntax] AT+XLEC?</p> <p>[Response/Action] +XLEC:<n>,<no_of_cells>,[<bandwithd>,[<bandwidth>[...]]] OK</p>
Test	<p>[Function] Test command returns range of supported parameters.</p> <p>[Syntax] AT+XLEC=?</p> <p>[Response/Action] +XLEC: (list of supported <n>s) OK</p>
Parameters	<p><n></p> <p>Integer type</p> <p>0 Disable URC(default)</p> <p>1 Enable URC</p> <p><no_of_cells></p> <p>Integer type, number of aggregated cells</p> <p>0 - not on LTE</p>

Command	Description
	1 - Primary cell only 2...5 - Secondary cells added <bandwidth> Integer type 0 - 1.4MHz 1 - 3MHz 2 - 5MHz 3 - 10MHz 4 - 15MHz 5 - 20MHz 255 - Invalid
Example	<pre>AT+XLEC=1 OK AT+XLEC? +XLEC: 1,1,5 OK AT+XLEC=? +XLEC: (0,1) OK</pre>
Reference	

9.1.17 +XAUTH, UICC AUTHENTICATE command

This command is used to pass Authentication data to UICC.

Command	Description
Set	<p>[Function] Set command will pass the Authentication data to UICC.</p> <p>[Syntax] AT+XAUTH=<sessionid>,<Auth_context_type>,<RAND>/<NAF_ID>,[<AUTN>/<IMPI>]</p> <p>[Response/Action] +XAUTH: <status>[,<Kc>,<SRES>][<RES/AUTS>,<CK>,<IK>,<kc>][Ks_ext_NAF] OK</p>

Command	Description
	Or CME ERROR: <error>
Read	N/A
Test	<p>[Function] Test command returns OK.</p> <p>[Syntax] AT+XAUTH=?</p> <p>[Response/Action] OK</p>
Parameters	<p><sessionid>: Is the value returned by +CCHO command after opening the AID (eg: ISIM) and before closing the AID. For SIM and USIM it needs to be 0.</p> <p><Auth_context_type>: 1 3G security context (input <RAND>, <AUTN>) 2 GSM security context (input <RAND>) 3 VGCS/VBS security context (planned for future) 4 GBA security context (Bootstrapping Mode) (input <RAND>, <AUTN>) 5 GBA security context (NAF Derivation Mode) (input <NAF_ID>, <IMPI> (<IMPI> not valid for ISIM)) 6 IMS AKA security context (valid only for ISIM) (input <RAND>, <AUTN>)</p> <p> Note:</p> <ol style="list-style-type: none"> <Auth_context_type> 3 is not supported. ISIM is an application residing on UICC and hence <Auth_context_type> 6 will be considered same as 3G security context. <p><RAND>, <AUTN>, <NAF_ID>, <IMPI> All input parameter are in String format and as per 3GPP.</p> <p><status>: 0 authentications successful 1 synchronize fail 2 MAC wrong(status code '9862')</p>

Command	Description
	<p>3 does not support security context(status code '9864')</p> <p>255 other failure</p> <p><RES/AUTS>:</p> <p>RES: if <status> is 0, then return RES</p> <p>AUTS: if <status> is 1, then return AUTS</p> <p><Kc>,<SRES>,<CK>,<IK>,< Ks_ext_NAF>,<RES/AUTS></p> <p>All output parameter are in string format and as per 3GPP</p>
Example	<pre>AT+XAUTH=0,4,"123456","789456" +XAUTH: 255 OK AT+XAUTH=? OK</pre>
Reference	

9.1.18+XCESQRC, Extended Signal Quality Reporting Configuration

This command is used to configure the Signal Strength reporting on each Radio Access Technology supported. Signal strength reporting can be configured as Change based or Periodic reporting.

Command	Description
Set	<p>[Function] Set command allows to configure the Signal strength reporting based on the configuration parameters provided.And also to Switch off / on the Signal strength reporting functionality.</p> <p>[Syntax] AT+XCESQRC=<mode>[,<RAT>,<config_type>,<config_params>]</p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] Read command returns the value of <mode>.</p> <p>[Syntax]</p>

Command	Description
	<p>AT+XCESQRC?</p> <p>[Response/Action]</p> <p>+ XCESQRC: <mode></p> <p>OK</p>
Test	<p>[Function]</p> <p>Test command returns values supported as compound values.</p> <p>[Syntax]</p> <p>AT+XCESQRC=?</p> <p>[Response/Action]</p> <p>+XCESQRC: (list of supported <mode>) , (list of supported <RAT>) , (list of supported<Config_type>)</p> <p>OK</p>
Parameters	<p><mode>: Integer type.</p> <p>0: Switch OFF the Signal strength reporting functionality. As this option disables signal strength functionality, AT clients will no more be able to receive any signal strength URC(even if URC like +XCESQI, +XCSQ is enabled), and the AT client query(like +CSQ,+XCSQ, +CESQ, +XCESQ) for signal strength will no more return current values.</p> <p>1: Switch ON the Signal strength reporting functionality. As this option enables signal strength functionality, AT clients will be able to receive any signal strength URC (depending on the URC setting), and the AT client query for signal strength will return current values.</p> <p><RAT>: Integer type.</p> <p>Defines the Radio access Technology for which the Signal strength reporting configuration need to be configured. The possible values are:</p> <p>0: GSM</p> <p>1: UMTS</p> <p>2: LTE</p> <p><config_type>: Integer type.</p> <p>Possible values are:</p> <p>0: Threshold based configuration</p> <p>1: Bar mapping based configuration</p> <p><config_params></p> <p>If the <RAT> is GSM, <config_params> consists of: <no_of_rxlev_bars>[,<rxlev_bar_</p>

Command	Description
	<p>config_1>,<rxlev_bar_config_2>,...,<rxlev_bar_config_n>][,<rxlev_threshold>[,<reporting_interval>]]</p> <p>If the <RAT> is UMTS, <config_params> consists of: <no_of_rscp_bars>[,<rscp_bar_config_1>,<rscp_bar_config_2>,...,<rscp_bar_config_n>], <no_of_ecno_bars> [,<ecno_bar_config_1>,<ecno_bar_config_2>,...,<ecno_bar_config_n>][,<rscp_threshold>,<ecno_threshold>[,<reporting_interval>]]</p> <p>If the <RAT> is LTE, <config_params> consists of: <no_of_rsrp_bars>[,<rsrp_bar_config_1>,<rsrp_bar_config_2>,...,<rsrp_bar_config_n>],<no_of_rsrq_bars>[,<rsrq_bar_config_1>,<rsrq_bar_config_2>,...,<rsrq_bar_config_n>],<no_of_rsrnr_bars>[,<rsnr_bar_config_1>,<rsnr_bar_config_2>,...,<rsnr_bar_config_n>][,<rsrp_threshold>,<rsrq_threshold>,<rsnr_threshold>[,<reporting_interval>]]</p>
Example	<pre>AT+XCESQRC=1 OK AT+XCESQRC? +XCESQRC: 1 OK AT+XCESQRC=? +XCESQRC: (0,1),(0-2),(0,1) OK</pre>
Reference	

9.1.19+XCESQ, Extended signal quality with URC support

Command	Description
Set	<p>[Function] Set command is used to enable/disable the Extended Signal Quality (XCESQI) unsolicited result code.</p> <p>[Syntax] AT+XCESQ=[<n>]</p> <p>[Response/Action] OK or</p>

Command	Description
	CME ERROR: <error>
Read	<p>[Function] Read command returns the XCESQ command setting, received signal quality parameters.</p> <p>[Syntax] AT+XCESQ?</p> <p>[Response/Action] +XCESQ: <n>,<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<rssnr>,<1xrtt_rssi>,<1xrtt_ecio>,<evdo_rssi>,<evdo_sinr> OK</p>
Test	<p>[Function] Test command returns values supported as compound values.</p> <p>[Syntax] AT+XCESQ=?</p> <p>[Response/Action] +XCESQ: (list of supported <n>s),(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),(list of supported <rssnr>s),(list of supported <1xrtt_rssi>s),(list of supported <1xrtt_ecio>s),(list of supported <evdo_rssi>s),(list of supported <evdo_sinr>s) OK</p>
Parameters	<p><n> 0 disable 1 enable</p>
Example	<pre>AT+XCESQ=1 OK AT+XCESQ? +XCESQ: 1,99,99,255,255,1,37,-18,255,255,255,255 OK AT+XCESQ=? +XCESQ:</pre>

Command	Description
	(0,1),(0-63,99),(0-7,99),(0-96,255),(0-49,255),(0-34,255),(0-97,255),(-100-100,255),(0-90,255),(0-62,255), (0-90,255), (0-60,255) OK
Reference	

9.1.20+ XDATACHANNEL, Configure the Data Channel

This command configures the channel over which CSD or GPRS data shall be routed. The data is default routed on the channel where the connection is established.

Command	Description
Set	<p>[Function] Set Command configures the channel over which CSD or GPRS data shall be routed.</p> <p>[Syntax] AT+XDATACHANNEL=<mode>,<csd_gprs_flag>,<ctrl_tid_path>,<tid_path>[,<connect_flag> [, <cid>]]</p> <p>[Response/Action] OK or CME ERROR: <error></p>
Test	<p>[Function] Test command returns the list of modes supported.</p> <p>[Syntax] AT+XDATACHANNEL=?</p> <p>[Response/Action] +XDATACHANNEL: (list of <mode>s),(list of <csd_gprs_flag>'s), (list of <connect_flag>'s), (list of supported <cid>'s) OK</p>
Parameters	<p><mode></p> <p>0 disable the routing</p> <p>1 enable the routing</p>

Command	Description
	<p>2 query current setting for the channel where the command is executed(other parameters will be ignored)</p> <p><csd_gprs_flag></p> <p>0 configure the channel for a CSD connection</p> <p>1 configure the channel for a GPRS connection</p> <p><ctrl_tid_path></p> <p>terminal for which the data routing mechanism shall be enabled, string format. (eg: "/mux/5")</p> <p><tid_path></p> <p>terminal to which a data call shall be routed, string format.(eg: "/mux/2")</p> <p><connect_flag></p> <p>0 No Reporting on the data channel (neither CONNECT nor NO CARRIER)</p> <p>1 Reporting on the data channel enabled (= CONNECT and NO CARRIER)</p> <p>2 Reporting on the control channel enabled (= CONNECT and NO CARRIER)</p> <p><cid></p> <p>a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p> <ul style="list-style-type: none"> ■ The control channel must be in OPEN state when XDATACHANNEL command is sent ■ XDATACHANNEL settings will only apply while control channel DLC is OPEN and will be reset as soon as DLC is closed ■ When the XDATACHANNEL command is sent with <cid> parameter, then the data channel(<tid-path>) must be in OPEN state and the given <cid> should be already defined. ■ If the <cid> is deleted/undefined, the XDATACHANNEL settings pertaining to the <cid> are not retained. ■ Connection must be established(start and stop) through <ctrl-tid-path> for data to be properly routed ■ XDATACHANNEL query(mode=2) does not return the <cid> associated with the control channel, as the data routing of a control channel can be configured for multiple <cid>s
Example	at+xdatachannel=1,1,"/PCIE/IOSM/CTRL/1","/PCIE/IOSM/IPS/0",0

Command	Description
Reference	

9.1.21 +XDNS, Dynamic DNS Request

This command enables / disables a dynamic DNS (Domain Name Service) request before context activation. After context activation the DNS addresses of all activated contexts can be read out.

Command	Description
Set	<p>[Function] Set command enables/ disables a dynamic DNS (Domain Name Service) request before context activation</p> <p>[Syntax] AT+XDNS=<cid>,<mode></p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] Read command is used to read DNS addresses of all activated contexts after context activation.</p> <p>[Syntax] AT+XDNS?</p> <p>[Response/Action] +XDNS: <cid>, <primary DNS>, <secondary DNS> [+XDNS: <cid>, <primary DNS>, <secondary DNS> [...]] OK</p>

Command	Description
Test	<p>[Function] Test command returns (list of supported <cid>s), (list of supported <mode>s).</p> <p>[Syntax] AT+XDNS=?</p> <p>[Response/Action] +XDNS: (0-29) , (0-2) i.e. (list of supported <cid>s), (list of supported <mode>s) OK</p>
Parameters	<p>cid () please refer command +CGDCONT <mode> may be 0 disable dynamic DNS Request (default) 1 enable dynamic DNS Request (Ipv4) 2 enable dynamic DNS Request (Ipv6) <primary DNS>, <secondary DNS> are the strings which represents the DNS addresses, and given as dot-separated numeric (0-255) parameter of the form: a1.a2.a3.a4 for IPv4 a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6 and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.a17.a18.a19.a20 for IPv4v6.(here a1 to a4 represent IPV4 and a5 to a20 represent IPv6) The DNS address is by default "0.0.0.0" which is not a valid address. Note: IPv6 address obtained on LTE will be prefixed with a constant 8 byte address "FE.80.00.00.00.00.00" if network has not provided.</p>
Example	<pre>AT+XDNS=0,1 OK AT+XDNS? +XDNS: 0, "0.0.0.0", "0.0.0.0" OK</pre>
Reference	

9.1.22 +XSYSTRACE, Configure System Trace

This command allows to configure system trace port, mode.

Command	Description
Set	<p>[Function] Execution command allows to configure system trace port, mode</p> <p>[Syntax] AT+XSYSTRACE=<mode>,[<master>=<port>[:<master>=<port>[:]]],[<master>=<config>[:<master>=<config>[:]]],[<oct_mode>[:pti1=<pti1_mode>[:pti2=<pti2_mode>]]]</p> <p>[Response/Action] OK or CME ERROR: <error></p>
Test	<p>[Function] Test command returns list of supported <mode>s,[list of supported "<master>=<port>"s],[list of supported "<master>=<config>"s],[list of supported oct=<oct_mode>[:pti1=<pti1_mode>[:pti2=<pti2_mode>"s].</p> <p>[Syntax] AT+ XSYSTRACE =?</p> <p>[Response/Action] +XSYSTRACE:[list of supported <mode>s],[list of supported "<master>=<port>"s],[list of supported "<master>=<config>"s],[list of supported oct=<oct_mode>[:pti1=<pti1_mode>[:pti2=<pti2_mode>"s] OK</p>
Limitation	<p>The total length of parameters in set command cannot exceed 400 characters due to C-AT parser limitation. For set command with total parameter length exceeding 400 characters, multiple set commands by splitting the parameters can be issued.</p>
Example	<p>at+xsystrace=0,"bb_sw=1","bb_sw=sdl:th,tr,st,pr,mo,lt,db,li,sy lte_stk:0x02,0x83FFFFFF ims:1 lte_stk:0x01,0xFFFFFFFF,0xFFFFFFFF,0xFFFFFFFF,0xFFFFFFFF","oct=4;oct_fcs=16"</p>

Command	Description
Reference	

9.1.23 +XADPCLKFREQINFO, Adaptive Clock Frequency Info

This execution command returns the list of frequency information structures. The frequency information includes the center frequency of the channel number, frequency spread of the channel number and the noise power referred at antenna.

Command	Description
Set	<p>[Function] Set command enables/disables the +XADPCLKFREQINFO URC URC will be: +XADPCLKFREQINFO: <centFreq>, <freqSpread>, <noisePower></p> <p>[Syntax] AT+XADPCLKFREQINFO=<n></p> <p>[Response/Action] OK or CME ERROR: <error></p>
Read	<p>[Function] Read command returns the list of frequency information available.</p> <p>[Syntax] AT+XADPCLKFREQINFO?</p> <p>[Response/Action] +XADPCLKFREQINFO:<n> OK</p>

Command	Description
Test	<p>[Function] Test command returns (<centFreq>,<freqSpread>, <noisePower>).</p> <p>[Syntax] AT+ XADPCLKFREQINFO=?</p> <p>[Response/Action] + XADPCLKFREQINFO: list of supported (<centFreq>,<freqSpread>, <noisePower>) OK or +CME ERROR: <err></p>
Parameters	<p><n> 0: disable +XADPCLKFREQINFO unsolicited result code 1: enable +XADPCLKFREQINFO unsolicited result code</p> <p><centFreq> The center frequency of the channel number in Hz, should be zero when the radio is off. This is host receiver channel frequency.</p> <p><freqSpread> The frequency spread of the channel number in Hz, should be zero when the radio is off. This is host receiver channel frequency spread.</p> <p><noisePower> The noise power referred at antenna in dBm, at the reported center frequency, and integrated over a bandwidth equal to reported frequency spread. This value shall be zeroed if not used.</p>
Example	<pre>AT+XADPCLKFREQINFO=1 OK AT+XADPCLKFREQINFO? +XADPCLKFREQINFO: 1 OK AT+ XADPCLKFREQINFO=? +XADPCLKFREQINFO: 1850000000, 5, 0, 0 OK</pre>

Command	Description
Reference	

10 Hardware Information

10.1 Clock Configuration

10.1.1 +CLK26M, 26MHz Clock Output From CLK26M

This command is used to control the 26MHz clock output from CLK26M.

Command	Description
Set	<p>[Function] Switch on/off 26MHz clock output from PIN CLK26M</p> <p>[Syntax] AT+CLK26M=<n></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] Query the current status of PIN CLK26M</p> <p>[Syntax] AT+CLK26M?</p> <p>[Response/Action] + CLK26M: <n> OK</p>
Test	<p>[Function] Query the range of the parameters</p> <p>[Syntax]</p>

Command	Description
	AT+CLK26M=? [Response/Action] +CLK26M: (list of supported <n>s) OK
Parameters	<n> 0: switch off the clock, default value. 1: switch on the clock
Example	

11 GPRS

11.1 GPRS Functionality

GSM 07.07 defines commands that a TE may use to control a GPRS ME via a non-multiplexed character-stream interface. This places certain limitations on the functionality of the interface. For example, it is not possible for the ME to send control information to the TE or for the TE to send commands to the ME whilst the interface is in the online data state, unless the layer 2 protocol itself supports this feature (GSM 07.60-12). However, Modem-specific escape mechanism (DTR) is provided to enable the TE to switch the Modem into limited online command state.

The use of a multiplexed interface, (GSM 07.10), is not considered here (See “Multiplexer Feature”). The Modem-specific escape mechanism use DTR as an escape signal (following &D parameters) and designed for limited non network related commands. This specific mechanism purpose is to give the user a way to retrieve the signal strength. The time limit of consecutive DTR toggles is a minimum of 90 seconds. The Modem-specific is not designed to support online command and data states both at the same time, therefore any wrong or extreme usage can cause unexpected behaviors. The basic GPRS concept is be “always connected” and there is no charge for being connected (only per real data transferred).

11.2 GPRS Commands

This section defines commands that a terminal may use to control a GPRS ME. GPRS MTs vary widely in functionality. A class A ME might support multiple PDP-types as well as circuit-switched data, and use

multiple external networks QoS profiles. At the other extreme, a class C ME might support only a single PDP-type using a single external network, and rely on the HLR to contain the PDP context definition. A comprehensive set of GPRS-specific commands is defined below to provide the flexibility needed by the more complex ME. The commands are designed to be expandable to accommodate new PDP types and interface protocols, merely by defining new values for many of the parameters. Multiple contexts may be activated if the interface link-layer protocol is able to support them. The commands use the extended information and error message capabilities described in this specification. For MTs of intermediate complexity, most commands have simplified forms where certain parameters may be omitted. For the simplest MTs, and for backwards compatibility with existing communications software, it is possible to control access to the GPRS using existing modem-compatible commands. This "modem compatible" mode of operation is described below.

11.2.1+CGCLASS, GPRS Mobile Station Class

This command is used to set the Modem to operate according to the specified GPRS mobile class.

If the requested class is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Command	Description
Set	<p>[Function] Set command is used to set the MT to operate according the specified mode of operation</p> <p>[Syntax] AT +CGCLASS=<class></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command returns the current GPRS mobile class.</p> <p>[Syntax] AT +CGCLASS?</p> <p>[Response/Action] +CGCLASS: <class> OK</p>

Command	Description
Test	<p>[Function]</p> <p>The Test command is used for requesting information on the supported GPRS mobile classes</p> <p>[Syntax]</p> <p>AT +CGCLASS=?</p> <p>[Response/Action]</p> <p>+CGCLASS: (list of supported <class>s)</p> <p>OK</p>
Parameters	<p><class> String parameter that indicates the GPRS mobile class:</p> <p>A class A // only supported if UMTS_SUPPORT is enabled</p> <p>B meaning mobile class B</p> <p>CG class C in GPRS mode</p> <p>CC class C in circuit switched mode</p>
Example	<p>AT+CGCLASS=?</p> <p>+CGCLASS: ("A","B","CC","CG")</p> <p>OK</p>
Reference	3GPP TS 27.007

11.2.2+CGDCONT, Define PDP Context


This command specifies the PDP (Packet Data Protocol) context.


This command allows specifying specific PDP context parameter values for a PDP context, identified by the local context identification parameter <cid>.

If the command is used only with the one parameter <cid>, it means that the corresponding PDP context becomes undefined.

Command	Description
Set	<p>[Function]</p> <p>The Set command specifies the context identification parameter values for a PDP context. A special form of the Set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.</p> <p>[Syntax]</p>

Command	Description
	<p>AT+CGDCONT= [<cid> [, <PDP_type> [, <APN> [, <PDP_addr>[, <d_comp> [, <h_comp>>],[<IPv4AddrAlloc>,<emergency_indication>,<PCSCF_discovery>,<IM_CN_Signaling_Flag_Ind>]]]]]]]]]</p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The read command returns the current settings for each defined context. It will be read only “OK” without any set command.</p> <p>[Syntax]</p> <p>AT+CGDCONT?</p> <p>[Response/Action]</p> <p>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>,<IPv4AddrAlloc>,<emergency_indication>,<PCSCF_discovery>,<IM_CN_Signaling_Flag_Ind>]]]]]</p> <p>OK</p>
Test	<p>[Function]</p> <p>The Test command returns the values supported as a compound value. If the ME supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.</p> <p>[Syntax]</p> <p>AT+CGDCONT=?</p> <p>[Response/Action]</p> <p>+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 <emergency_indication>s),(list of supported <PCSCF_discovery>s),(list of supported <IM_CN_Signaling_Flag_Ind>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</p>

Command	Description
	<p>supported<emergency_indication>s),(list of supported <PCSCF_discovery>s),(list of supported <IM_CN_Signaling_Flag_Ind>s)[...]]</p> <p>OK</p>
Parameters	<p><cid> Numeric parameter specifying a particular PDP context definition (PDP Context Identifier). The parameter is local to the Terminal-Mobile Terminal interface and is used in other PDP context-related commands. The value is from 0 to 29</p> <p><"PDP_type"> (Packet data protocol type) String parameter (in quotation marks) specifying the type of packet data protocol: IP</p> <p>IP Internet Protocol (IETF STD 5)</p> <p>IPV6 Internet Protocol, version 6 (IETF RFC 2460)</p> <p>IPV4V6 Virtual<PDP_type>introduced to handle dual IP stack capability</p> <p> Note: The<PDP_type>is IPV6 and IPV4V6 are supported only is the feature FEAT_IPV6 support is enabled</p> <p><"APN"> (Access Point Name) String parameter (in quotation marks), which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, the subscription value is requested.</p> <p><"PDP_address"> String parameter (in quotation marks), which identifies the ME in the address space applicable to the PDP.</p> <p>If the value is null or omitted, a value may be provided by the terminal during the PDP start up procedure or, failing that, a dynamic address is requested.</p> <p>The Read form of the command continues to return the null string even if an address has been allocated during the PDP start up procedure. The allocated address may be read using the +CGPADDR command.</p> <p>The default value is 0.</p> <p><d_comp> Numeric parameter that controls PDP data compression.</p> <p>0 off (default if value is omitted) (L810-00-06 only support off option)</p> <p>1 on (manufacturer preferred compression)</p> <p>2 V.42 bis</p> <p>Other values are reserved. The default value is 0.</p> <p><h_comp> a numeric parameter that controls PDP header compression</p> <p>0 off (default if value is omitted)</p> <p>1 on (manufacturer preferred compression)</p>

Command	Description
	<p>2 RFC1144 (applicable for SNDCP only)</p> <p>3 RFC2507</p> <p>4 RFC3095 (applicable for PDCP only)</p> <p>Other values are reserved.</p> <p><IPv4AddrAlloc> a numeric parameter that controls how the MT/TA requests to get the IPv4 address information</p> <p>0 IPv4 Address Allocation through NAS Signaling</p> <p>1 IPv4 Address Allocated through DHCP</p> <p><emergency_indication> a numeric parameter used to indicate whether the PDP context is for emergency bearer services or not.</p> <p>0 PDP context is not for emergency bearer services</p> <p>1 PDP context is for emergency bearer services</p> <p><P-CSCF_discovery> a numeric parameter influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L</p> <p>0 Preference of P-CSCF address discovery not influenced by +CGDCONT</p> <p>1 Preference of P-CSCF address discovery through NAS Signaling</p> <p><IM_CN_Signaling_Flag_Ind> a numeric parameter used to indicate to the network whether the PDP context is for IM CN subsystem-related signaling only or not.</p> <p>0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only</p> <p>1 UE indicates that the PDP context is for IM CN subsystem-related signaling only</p> <p> Note: The parameters <IPv4AddrAlloc>, <IM_CN_Signaling_Flag_Ind>, and <P-CSCF_discovery>, can be over-riden by AT+XPCO command (meaning AT+CGDCONT values for these parameters can be over-riden by issuing AT+XPCO later).</p>
Example	<pre>AT+CGDCONT? OK // Only without any set command. AT+CGDCONT=1, "IP", "CMNET" OK AT+CGDCONT=2, "IP", "CMWAP"</pre>

Command	Description
	OK AT+CGDCONT? +CGDCONT: 1,"IP","CMWAP","0.0.0.0",0,0 +CGDCONT: 2,"IP","CMNET","0.0.0.0",0,0 OK AT+CGACT=1 OK AT+CGDCONT? +CGDCONT: 1,"IP","CMWAP","10.230.50.116",0,0 +CGDCONT: 2,"IP","CMNET","10.3.97.156",0,0 OK AT+CGDCONT=? +CGDCONT: (1-20),"IP",,,(0),(0,1,2,3,4),(0,1),(0,1),(0,1),(0,1) +CGDCONT: (1-20),"IPV6",,,(0),(0,1,2,3,4),(0,1),(0,1),(0,1),(0,1) +CGDCONT: (1-20),"IPV4V6",,,(0),(0,1,2,3,4),(0,1),(0,1),(0,1),(0,1) OK
Reference	3GPP TS 27.007

11.2.3+CGQMIN, Quality of Service Profile (Min Acceptable)

This command enables the terminal to specify the minimum acceptable profile which is checked by the ME against the negotiated profile returned in the Activate PDP Context Accept message.

Command	Description
Set	<p>[Function]</p> <p>The Set command specifies a profile for the context identified by the (local) context identification parameter,<cid>. As this is the same parameter that is used in the +CGDCONT command, the +CGQMIN command is effectively an extension of the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value.</p> <p>[Syntax]</p> <p>AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability.>[,<peak>[,<mean>]]]]]</p>

Command	Description
	<p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The Read command returns the current settings for each defined context.</p> <p>[Syntax]</p> <p>AT+CGQMIN?</p> <p>[Response/Action]</p> <p>+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF></p> <p>+CGQMIN: <cid>,<precedence>,<delay>,<reliability.>,<peak>,<mean>[...]]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Test	<p>[Function]</p> <p>The Test command returns the parameter value ranges for each <PDP_type></p> <p>[Syntax]</p> <p>AT+CGQMIN=?</p> <p>[Response/Action]</p> <p>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s)</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>
Parameters	<p><cid> A numeric parameter that specifies a particular PDP context definition.</p> <p>The value is from 0 to 29</p> <p>For <cid> refer to defined values under +CGDCONT command.</p> <p><precedence> A numeric parameter that specifies the precedence class, the value is from 0 to 3.</p> <p><delay> A numeric parameter that specifies the delay class, the value if from 0 to 4.</p>

Command	Description
	<p><reliability> A numeric parameter that specifies the reliability class, the value is from 0 to 5.</p> <p><peak> A numeric parameter that specifies the peak throughput class, the value is from 0 to 9.</p> <p><mean> A numeric parameter that specifies the mean throughput class, the value is from 0 to 18 or 31.</p>
Example	<pre>AT+CGQMIN=? +CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31) OK AT+CGQMIN? +CGQMIN: 1,2,4,3,9,10 +CGQMIN: 2,2,4,3,9,10 OK</pre>
Reference	3GPP TS 27.007

11.2.4+CGQREQ, Quality of Service Profile (Requested)

This command enables the terminal to specify a Quality of Service Profile that is used when the ME sends an Activate PDP Context Request message to the network.

Command	Description
Set	<p>[Function]</p> <p>The Set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. As this is the same parameter that is used in the +CGDCONT command, the +CGQREQ command is effectively an extension of the +CGDCONT command. The QoS profile consists of a number of parameters, each of which may be set to a separate value. A special form of the Set command, +CGQREQ=<cid>, causes the requested profile for context number <cid> to become undefined.</p> <p>[Syntax]</p> <pre>AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]</pre> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>+CME ERROR: <err></p>

Command	Description
Read	<p>[Function] The Read command returns the current settings for each defined context.</p> <p>[Syntax] AT+CGQREQ?</p> <p>[Response/Action] +CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>, <mean> OK</p>
Test	<p>[Function] The Test command returns values supported as a compound value. If the ME supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.</p> <p>[Syntax] AT+CGQREQ=?</p> <p>[Response/Action] +CGQREQ: <PDP_type>,(list of supported<precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s) OK</p>
Parameters	<p><cid> A numeric parameter that specifies a particular PDP context definition. The value is from 0 to 29</p> <p><precedence> A numeric parameter that specifies the precedence class, the value is from 0 to 3.</p> <p><delay> A numeric parameter that specifies the delay class, the value is from 0 to 4.</p> <p><reliability> A numeric parameter that specifies the reliability class, the value is from 0 to 5.</p> <p><peak> A numeric parameter that specifies the peak throughput class, the value is from 0 to 9.</p> <p><mean> A numeric parameter that specifies the mean throughput class, the value is from 0 to 18 or 31.</p>
Example	<p>AT+CGQREQ=? +CGQREQ: ("IP"),(0-3),(0-4),(0-5),(0-9),(1-18,31)</p>

Command	Description
	OK AT+CGQREQ? +CGQREQ: 1,2,4,3,9,10 +CGQREQ: 2,2,4,3,9,10 OK AT+CGQREQ=1,0,,0,0,10 OK AT+CGQREQ? +CGQREQ: 1,0,4,0,0,10 +CGQREQ: 2,2,4,3,9,10 OK
Reference	3GPP TS 27.007

11.2.5+CGATT, GPRS Attach or Detach

This command attaches/detaches the ME to/from the GPRS service. When the command has completed, the ME remains in V.25ter command state. If the ME 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.

Command	Description
Set	<p>[Function] The Set command attaches/detaches the ME to/from the GPRS service.</p> <p>[Syntax] AT+CGATT=<state></p> <p>[Response/Action] OK or: +CME ERROR: <err></p>
Read	<p>[Function] The Read command returns the current GPRS service state.</p> <p>[Syntax]</p>

Command	Description
	AT+CGATT? [Response/Action] +CGATT: <state> OK
Test	[Function] The Test command requests information on the supported GPRS service states. [Syntax] AT+CGATT=? [Response/Action] +CGATT: (list of supported <state>s) OK
Parameters	<state> Indicates the state of the GPRS attachment: 0 Detached. 1 Attached.
Example	AT+CGATT=? +CGATT: (0,1) OK AT+CGATT? +CGATT: 0 OK AT+CGATT=0 OK
Reference	3GPP TS 27.007

11.2.6D*99, Request GPRS Service "D"

This command enables the ME to perform the actions necessary for establishing communication between the terminal and the external Packet Data Network (PDN).

The ITU V.25ter 'D' (Dial) command causes the ME to enter the ITU V.25ter Online Data state and together with the terminal, to start the specified layer 2 protocol. The ME returns CONNECT to confirm acceptance of the command prior to entering the ITU V.25ter Online Data state. No further commands may follow on the AT command line.

The detailed behavior after the Online Data state has been entered is dependent on the PDP type, and is described briefly. GPRS attachment and PDP context activation procedures may take place prior to, or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

When the layer 2 protocols have terminated, either as a result of an orderly shut down of the PDP or an error, the ME enters the ITU V.25ter command state and returns the NO CARRIER final result code.

If <called address> is supported and provided, the ME automatically sets up a virtual call to the specified address after the PDP context has been activated.

If <L2P> and <cid> are supported, the +CGDCONT, +CGQREQ and other such commands may then be used in The modem initialization AT command string to set values for PDP type, APN, QoS and so on.

If <L2P> is not supported, or is supported but omitted, the ME uses a layer 2 protocol appropriate to the PDP type.

If <cid> is not supported, or is supported but omitted, the ME attempts to activate the context using one of the following:


Any information provided by the terminal during the PDP start up procedure. For example, the terminal may provide a PDP type and/or PDP address to the ME.

A prior knowledge, for example, the ME may implement only one PDP type.

Using the "Empty PDP type" No PDP address or APN is sent in this case and only one PDP context subscription record is present in the HLR for this subscriber.

This command may be used in both normal and modem compatibility modes.

Command	Description
Set	<p>[Function] This command enables the ME to perform the actions necessary for establishing communication between the terminal and the external Packet Data Network (PDN).</p> <p>[Syntax] ATD*<GPRS_SC>[* [<called_address>] [*<L2P>][*<cid>]]]#</p> <p>[Response/Action] CONNECT or: ERROR</p>
Read	N/A
Test	N/A
Parameters	<GPRS_SC> (GPRS Service Code) Digit string (value 99) which identifies a

Command	Description
	<p>request to use GPRS.</p> <p><called_address> String that identifies the called party in the address space applicable to the PDP. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. Also, the comma character "," may be used as a substitute for the period character ".".</p> <p>For PDP type OSP: IHOSS, the following syntax may be used for</p> <p><called_address>: [<host>] [@<port>] [@<protocol>]] where <host>, <port> and <protocol> are defined in "+CGDCONT,Define PDP Context".</p> <p>For communications software that does not support arbitrary characters in the dial string, a numeric value equivalent to the host name may be used. However, this should be avoided if at all possible.</p> <p><L2P> String variable which indicates the layer 2 protocol to be used.</p> <p>For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents are used:</p> <p>0 NULL 1 PPP 2 PAD 3 X25 9 yyyy M-xxxx</p> <p>Other values are reserved and result in an ERROR response to the Set command.</p> <p> Note: V.250 (and certain communications software) do not permit arbitrary characters in the dial string. The <L2P> and <called_address> strings are therefore specified as containing digits (0-9) only.</p> <p><cid>: Digit string which specifies a particular PDP context definition (See "+CGDCONT, Define PDP Context").</p>
Example	<pre>AT+CGDCONT? +CGDCONT: 1,"IP","3GNET","10.168.15.100",0,0,0,0,0 +CGDCONT: 2,"IP","3GNET","10.227.131.75",0,0,0,0,0 OK ATD*99***2# CONNECT</pre>

11.2.7+CGACT, PDP Context Activate or Deactivate

This command activates/deactivates the specified PDP context(s).

In some GPRS networks, +CGACT is not supported. the ATD*99 # command can be used to establish a connection.

Activating a context can take up to 150 seconds.

Deactivating a context can take up to 40 seconds.

When aborting a +CGACT Set command, the context is closed. This can take up to 40 seconds.


Command	Description
Set	<p>[Function]</p> <p>The Set command activates/deactivates the specified PDP context(s). When the command is completed, the ME remains in V.25 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 ME is not GPRS-attached when the activation form of the command is executed, the ME first performs a GPRS attach and then attempts to activate the specified contexts. If the attach fails, the ME responds with an ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.</p> <p>[Syntax]</p> <p>AT+CGACT=[<state>[,<cid>[,<cid>[,]]]]</p> <p>[Response/Action]</p> <p>OK</p> <p>or:</p> <p>NO CARRIER</p> <p>or:</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The Read command returns the current activation states for all the defined PDP contexts.</p> <p>[Syntax]</p> <p>AT+CGACT?</p>

Command	Description
	<p>[Response/Action]</p> <p>+CGACT: <cid>,<state><CR><LF></p> <p>+CGACT: <cid>,<state><CR><LF></p> <p>+CGACT: <cid>,<state></p> <p>OK</p>
Test	<p>[Function]</p> <p>The Test command requests information on the supported PDP context activation states.</p> <p>[Syntax]</p> <p>AT+CGACT=?</p> <p>[Response/Action]</p> <p>+CGACT: (list of supported <state>s)</p> <p>OK</p>
Parameters	<p><state> Indicates the activation state of the context:</p> <p>0 Non-active</p> <p>1 Active</p> <p><cid> 0-29 A numeric parameter that specifies a particular PDP context definition</p>
Example	<p>AT+CGACT=?</p> <p>+CGACT: (0,1)</p> <p>OK</p> <p>AT+CGACT?</p> <p>OK</p> <p>AT+CGACT=1</p> <p>ERROR //GPRS network not present.</p>
Reference	3GPP TS 27.007

11.2.8+CGPADDR, GPRS Addresses

This command reads the allocated PDP addresses for the specified context identifiers.

Command	Description
Set	<p>[Function]</p> <p>The Set command returns a list of PDP addresses for the specified context identifiers.</p>

Command	Description
	<p>[Syntax] AT+CGPADDR=[<cid>[,<cid>[,]]]</p> <p>[Response/Action] +CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [<CR><LF> +CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][...] OK</p>
Read	N/A
Test	<p>[Function] The Test command returns the list of defined <cid>s.</p> <p>[Syntax] AT+CGPADDR=?</p> <p>[Response/Action] +CGPADDR: (list of defined <cid>s) OK</p>
Parameters	<p><cid> A numeric parameter that specifies a particular PDP context definition. If no <cid> is specified, the addresses for all defined context are returned.</p> <p><PDP_address> each is a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the+CGDCONT 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.</p> <p> Note: IPv6 address obtained on LTE will be prefixed with a constant 8 byte address "FE.80.00.00.00.00.00" if network has not provided.</p>
Example	<p>AT+CGPADDR=? +CGPADDR: (1,2)</p>

Command	Description
	OK AT+CGPADDR=1 +CGPADDR: 1,"0.0.0.0" OK
Reference	3GPP TS 27.007

11.2.9+CGANS, Manual response to a network request for PDP context activation

This command requests the MT to respond to a network request for Packet Domain PDP context activation which has been signaled to the TE by the RING or +CRING unsolicited result code



Note:

This is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. A +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be ignored.

Command	Description
Set	<p>[Function] The set command requests the MT to respond to a network request for Packet Domain PDP context activation which has been signalled to the TE by the RING or +CRING unsolicited result code.</p> <p>[Syntax] AT+CGANS=[<response>],[<L2P> , [<cid>]]</p> <p>[Response/Action] OK Or CME ERROR : <error></p>
Read	N/A
Test	<p>[Function] The test command returns the values of <response> and <L2P> supported by the MT</p>

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Command	Description
	<p>as compound values.</p> <p>[Syntax] AT+CGANS=?</p> <p>[Response/Action] +CGANS: (list of supported <response>s), (list of supported <L2P>s)</p>
Parameters	<p><response> A numeric parameter which specifies how the request should be responded to.</p> <p>0 reject the request</p> <p>1 accept and request that the PDP context be activated</p> <p>If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.</p> <p><L2P> A string parameter which indicates the layer 2 protocol to be used (see +CGDATA command).</p> <p><cid> A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p> <p>The <response> parameter allows the TE to accept or reject the request. If <response> is 0, the request is rejected and the MT returns OK to the TE. If <response> is 1, the following procedure is followed by the MT.</p> <p>Commands following the +CGANS command in the AT command line shall not be processed by the MT.</p> <p>If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.</p> <p>If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.</p> <p>If the activation is successful, data transfer may proceed</p>
Example	<p>AT+CGANS=?</p> <p>+CGANS: (0,1), (PPP,M-OPT-PPP,M-HEX,M-RAW_IP)</p>

Command	Description
	OK
Reference	3GPP TS 27.007

11.2.10 +CGAUTO, Automatic Response to a Network Request for PDP Context Activation

The set command disables or enables an automatic positive or negative response (auto-answer) to the receipt of a NW initiated Request PDP Context Activation message from the network in UMTS/GPRS and a NW-initiated Request EPS Bearer Activation/ Modification Request messages in EPS. It also provides control over the use of the V.250 basic commands 'S0', 'A' and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.



Note:

When the +CGAUTO=1 command is received, the MT shall attempt to perform a PS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, this is followed by the intermediate result code CONNECT. The MT then enters V.250 online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

Command	Description
Set	<p>[Function]</p> <p>The set command disables or enables an automatic positive or negative response (auto-answer) to the receipt of a NW initiated Request PDP Context Activation message from the network.</p> <p>[Syntax]</p> <p>AT+CGAUTO = [<n>]</p> <p>[Response/Action]</p> <p>OK</p> <p>Or</p> <p>CME ERROR : <error></p>

Command	Description
Read	<p>[Function] The read command returns the current setting for the auto-answer whether it's enabled or disabled.</p> <p>[Syntax] AT+CGAUTO?</p> <p>[Response/Action] +CGAUTO: <n> OK</p>
Test	<p>[Function] The test command returns the values of <n> supported by MT as a compound value</p> <p>[Syntax] AT+CGAUTO=?</p> <p>[Response/Action] +CGAUTO: (list of supported <n>s) OK</p>
Parameters	<p><n> Is a numeric parameter which indicates the setting for the auto-answer to be used</p> <p>0 Turn off automatic response for Packet Domain only Packet Domains network requests are manually accepted or rejected by the +CGANS command.</p> <p>1 Turn on automatic response for Packet Domain only Packet Domain network requests are automatically accepted according to the description above.</p> <p>2 Modem compatibility mode, Packet Domain only Automatic acceptance of Packet Domain network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject Packet Domain requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.</p> <p>3 Modem compatibility mode, Packet Domain and circuit switched calls (default) Automatic acceptance of both Packet Domain network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject Packet Domain requests. (+CGANS</p>

Command	Description
	CME ERROR : <error>
Read	<p>[Function] The read command returns the current settings for each defined context.</p> <p>[Syntax] AT+CGEQMIN?</p> <p>[Response/Action] +CGEQMIN: <cid>, <Traffic class>, <Maximum bit rate UL>, <Maximum bit rate DL>, <Guaranteed bit rate UL>, <Guaranteed bit rate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority> [, <Source statistics descriptor>, <Signaling indication>] [<cr><lf>+cgeqmin: <cid>,="" <delivery="" <guaranteed="" <maximum="" <residual="" <sdu="" <signaling="" <source="" <traffic="" <transfer="" [,="" [...]]<="" bit="" class>,="" delay>,="" descriptor>,="" dl>,="" erroneous="" error="" handling="" indication>]="" of="" order>,="" p="" priority>="" rate="" ratio>,="" sdu="" sdus>,="" size>,="" statistics="" ul>,=""> </cr><lf>+cgeqmin:></p>
Test	<p>[Function] 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.</p> <p>[Syntax] AT+CGEQMIN=?</p> <p>[Response/Action] +CGEQMIN: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bit rate UL>s) ,(list of supported <Maximum bit rate DL>s) ,(list of supported <Guaranteed bit rate UL>s) ,(list of supported <Guaranteed bit rate DL>s) ,(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s) [(list of supported <Source statistics descriptor>s) ,(list of supported <Signaling indication>s)]</p>

Command	Description
	<p>[<CR><LF>+CGEQMIN: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bit rate UL>s) ,(list of supported <Maximum bit rate DL>s) ,(list of supported <Guaranteed bit rate UL >s) ,(list of supported<Guaranteed bit rate DL >s) ,(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s) [, (list of supported <Source statistics descriptor>s) ,(list of supported <Signaling indication>s)] [...]]</p>
Parameters	<p><cid> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).</p> <p><Traffic class> <Traffic class> a numeric parameter that indicates the type of application for which the UMTS bearer service is on format.</p> <p>0 conversational 1 streaming 2 interactive 3 background Other values are reserved.</p> <p><Maximum bit rate UL> A numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bit rate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32, ...) (refer 3GPP TS 24.008 sub clause 10.5.6.5).</p> <p><Maximum bit rate DL> A numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bit rate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32, ...) (refer 3GPP TS 24.008 sub clause 10.5.6.5).</p> <p><Guaranteed bit rate UL> A numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bit rate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32, ...) (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Guaranteed bit rate DL> A numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bit rate of 32kbit/s would be specified as '32' (e.g.</p>

Command	Description
	<p>AT+CGEQMIN=...,32, ...) (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Delivery order> A numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <p>0 no 1 yes</p> <p>Other values are reserved.</p> <p><Maximum SDU size> A numeric parameter (1,2,3,...) that indicates the maximum allowed SDU size in octets(refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><SDU error ratio>A string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQMIN=..., "5E3",...) (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Residual bit error ratio> A string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQMIN=..., "5E3",...) (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Delivery of erroneous SDUs> A numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.</p> <p>0 no 1 yes 2 no detect</p> <p>Other values are reserved.</p> <p><Transfer delay> A numeric parameter (0,1,2,...) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Traffic handling priority> A numeric parameter (1,2,3,...) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Source Statistics Descriptor> Supported in R7 P S a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This</p>

Command	Description
	<p>parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p>0 Characteristics of SDUs is unknown (default value)</p> <p>1 Characteristics of SDUs corresponds to a speech source</p> <p>Other values are reserved.</p> <p><Signaling Indication> Supported in R7 PS a numeric parameter used to indicate confirmat content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p>0 PDP context is not optimized for confirmat (default value)</p> <p>1 PDP context is optimized for confirmat</p> <p><PDP_type> (See +CGDCONT and +CGDSCONT commands). If a value is omitted for a particular class then the value is considered to be unspecified.</p>
Example	<pre>AT+CGEQMIN? +CGEQMIN: 1,0,0,0,0,0,0,0,"0E0","0E0",0,0,0,0,0 +CGEQMIN: 6,0,0,0,0,0,0,0,"0E0","0E0",0,0,0,0,0 +CGEQMIN: 4,0,0,0,0,0,0,0,"0E0","0E0",0,0,0,0,0 +CGEQMIN: 3,0,0,0,0,0,0,0,"0E0","0E0",0,0,0,0,0 +CGEQMIN: 2,0,0,0,0,0,0,0,"0E0","0E0",0,0,0,0,0 OK AT+CGEQMIN=? +CGEQMIN: "IP",(0-3),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps), (1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps, 8700-16000 in 100 kbps steps), (0,1),(10-1500,1502,1510,1520),("1E6","1E5","1E4","1E3","7E3","1E2","1E1"),("6E8"," 1E6","1E5","1E4","5E3","4E3","1E3","5E2","1E2"),(0-2),(10-150 in 10 ms steps, 200-950 in 50 ms steps, 1000-4000 in 50 ms steps),(0-3),(0,1),(0,1) OK</pre>
Reference	3GPP TS 27.007

Command	Description
	delay> ,<Traffic handling priority> [,<Source Statistics Descriptor> ,<Signaling Indication>] [...]
Test	<p>[Function]</p> <p>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.</p> <p>[Syntax]</p> <p>AT+CGEQREQ=?</p> <p>[Response/Action]</p> <p>+CGEQREQ: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bit rate UL>s) ,(list of supported <Maximum bit rate DL>s) ,(list of supported <Guaranteed bit rate UL>s) ,(list of supported <Guaranteed bit rate DL>s) ,(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s) [(list of supported <Source statistics descriptor>s) ,(list of supported <Signaling indication>s)] [<cr><lf>+cgeqreq: <delivery="" <guaranteed="" <maximum="" <pdp_type>,="" <residual="" <sdu="" <signaling="" <source="" <traffic="" <transfer="" (list="" ,(list="" [(list=""]="" bit="" class>s)="" delay>s)="" descriptor>s)="" dl>s)="" erroneous="" error="" handling="" indication>s)]<="" of="" order>s)="" p="" priority>s)="" rate="" ratio>s)="" sdu="" sdus>s)="" size>s)="" statistics="" supported="" ul>s)=""> </cr><lf>+cgeqreq:></p>
Parameters	<p><cid> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).</p> <p><Traffic class> A numeric parameter that indicates the type of application for which the UMTS bearer service is on format.</p> <p>0 conversational</p> <p>1 streaming</p> <p>2 interactive</p>

Command	Description
	<p>3 background subscribed value</p> <p>If the Traffic class is specified as conversational or streaming, then the Guaranteed and Maximum bit rate parameters should also be provided. Other values are reserved.</p> <p><Maximum bit rate UL> A numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Maximum bit rate DL> A numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Guaranteed bit rate UL> A numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bit rate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Guaranteed bit rate DL> A numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bit rate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Delivery order> A numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <p>0 no 1 yes 2 subscribed value.</p> <p>Other values are reserved.</p>

Command	Description
	<p><SDU error ratio> a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQREQ=..., "5E3",...). '0E0' means subscribed value (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Residual bit error ratio> a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQREQ=..., "5E3",...). '0E0' means subscribed value (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Delivery of erroneous SDUs> a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.</p> <p>0 no 1 yes 2 no-detect 3 subscribed value</p> <p>Other values are reserved.</p> <p><Transfer delay> a numeric parameter (0,1,2,...) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Traffic handling priority> a numeric parameter (1,2,3,...) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p><Source Statistics Descriptor> Supported in R7 P S a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is</p> <p>specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p>0 Characteristics of SDUs is unknown (default value) 1 Characteristics of SDUs corresponds to a speech source</p>

Command	Description
	<p>Other values are reserved.</p> <p><Signaling Indication> Supported in R7 P S a numeric parameter used to indicate confirmat content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 subclause 10.5.6.5).</p> <p>0 PDP context is not optimized for confirmat (default value)</p> <p>1 PDP context is optimized for confirmat<PDP_type>: (see +CGDCONT and +CGDSCONT commands)</p>
Example	<pre>AT+CGEQREQ=? +CGEQREQ: "IP",(0-4),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), 8700-16000 in 100 kbps steps),(1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), (1-63 in 1 kbps steps, 64-568 in 8 kbps steps, 576-8640 in 64 kbps steps), 8700-16000 in 100 kbps steps),(0,1),(10-1500,1502,1510,1520),("1E6","1E5","1E4","1E3","7E3","1E2","1E1"),("6E8","1E6","1E5","1E4","5E3","4E3","1E3","5E2","1E2"),(0-2),(10-150 in 10 ms steps, 200-950 in 50 ms steps, 1000-4000 in 50 ms steps),(0-3),(0,1),(0,1) OK</pre>
Reference	3GPP TS 27.007

11.2.13 +CGEQNEG, G Quality of Service Profile (Negotiated)

This command allows the TE to retrieve the negotiated QoS profiles returned in the Activate PDP Context Accept message.

Command	Description
Set	<p>[Function]</p> <p>Set command allows the TE to retrieve the negotiated QoS profiles returned in the Activate PDP Context Accept message.</p> <p>[Syntax]</p> <pre>AT+CGEQNEG = [<cid> [, <cid> [, ...]]]</pre> <p>[Response/Action]</p> <pre>+CGEQNEG: <cid>, <Traffic class>, <Maximum bit rate UL>, <Maximum bit rate DL>, <Guaranteed bit rate UL>, <Guaranteed</pre>

Command	Description
	bit rate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority> [<CR><LF>+CGEQNEG: <cid> , <Traffic class> , <Maximum bit rate UL> , <Maximum bit rate DL> , <Guaranteed bit rate UL> , <Guaranteed bit rate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority> [...]]
Read	N/A
Test	<p>[Function] Test command returns a list of <cid>s associated with active contexts.</p> <p>[Syntax] AT+CGEQNEG =?</p> <p>[Response/Action] +CGEQNEG: (list of <cid>s associated with active contexts)</p>
Parameters	<p><cid> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).</p> <p><Traffic class> A numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.</p> <p>0 conversational 1 streaming 2 interactive 3 background</p> <p>Other values are reserved.</p> <p><Maximum bit rate UL> A numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. +CGEQNEG:...,32, ...) (refer TS 24.008 subclause 10.5.6.5).</p> <p><Maximum bit rate DL> A numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. +CGEQNEG:...,32, ...) (refer TS 24.008 subclause 10.5.6.5)</p> <p><Guaranteed bit rate UL> A numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to</p>

Command	Description
	<p>deliver).</p> <p>As an example a bit rate of 32kbit/s would be specified as '32' (e.g. +CGEQNEG:...,32, ...) (refer TS 24.008 subclause 10.5.6.5).</p> <p><Guaranteed bit rate DL> A numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver).</p> <p>As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. +CGEQNEG:...,32, ...) (refer TS 24.008 subclause 10.5.6.5).</p> <p><Delivery order> A numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <p>0 no</p> <p>1 yes</p> <p>Other values are reserved.</p> <p><Maximum SDU size>A numeric parameter that (1,2,3,...) indicates the maximum allowed SDU size in octets (refer TS 24.008 subclause 10.5.6.5).</p> <p><SDU error ratio> a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic.</p> <p>The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. +CGEQNEG:..., "5E3",...) (refer TS 24.008 subclause 10.5.6.5).</p> <p><Residual bit error ratio> A string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs.</p> <p>The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. +CGEQNEG:..., "5E3",...) (refer TS 24.008 subclause 10.5.6.5).</p> <p><Delivery of erroneous SDUs> A numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.</p> <p>0 no</p> <p>1 yes</p> <p>2 no detect</p> <p>Other values are reserved.</p>

Command	Description
	<p><Transfer delay> A numeric parameter (0,1,2,...) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds (refer TS 24.008 subclause 10.5.6.5).</p> <p><Traffic handling priority> A numeric parameter (1,2,3,...) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers (refer TS 24.008 subclause 10.5.6.5)</p>
Example	<pre>AT+CGEQNEG=? +CGEQNEG: () OK</pre>
Reference	3GPP TS 27.007

11.2.14 +CGCMOD, PDP Context Modify

This command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs.

Command	Description
Set	<p>[Function]</p> <p>The set command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs.</p> <p>[Syntax]</p> <pre>AT+CGCMOD= [<cid>[,<cid>[,...]]]</pre> <p>[Response/Action]</p> <p>OK</p> <p>Or</p> <p>CME ERROR : <error></p>
Read	N/A
Test	<p>[Function]</p> <p>The test command returns a list of <cid>s associated with active contexts..</p> <p>[Syntax]</p> <pre>AT+CGCMOD=?</pre> <p>[Response/Action]</p> <pre>+CGCMOD: (list of <cid>s associated with active contexts)</pre>

Command	Description
	OK
Parameters	<cid> A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands)
Example	<pre> AT+CGDCONT? +CGDCONT: 1,"IP","CMNET","172.29.107.202",0,0 +CGDCONT: 2,"IP","", "0.0.0.0",1,1 +CGDCONT: 3,"IP","CMNET","0.0.0.0",0,0 +CGDCONT: 4,"IP","CMNET","0.0.0.0",0,0 +CGDCONT: 6,"IPV6","CDOE","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0 OK AT+CGCMOD=1,1, OK AT+CGCMOD=1,1,6 OK AT+CGDCONT? +CGDCONT: 1,"IP","CMNET","172.29.107.202",0,0 +CGDCONT: 2,"IP","", "0.0.0.0",1,1 +CGDCONT: 3,"IP","CMNET","0.0.0.0",0,0 +CGDCONT: 4,"IP","CMNET","0.0.0.0",0,0 +CGDCONT: 6,"IPV6","CDOE","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0 OK AT+CGCMOD=? +CGCMOD: (1,2,3,4,6) OK </pre>
Reference	3GPP TS 27.007

11.2.15 +CGDATA, Enter Data State

This execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more GPRS PDP types. This may include performing a GPRS attach and one or more PDP context activation. If the parameters are accepted, MT displays the intermediate result code CONNECT on TE and enters the online data state; thereafter data transfer may proceed. No other commands following +CGDATA in the command line will be processed.



Note: After data transfer is complete, the MT re-enters the command state and the final result

code is displayed on TE. In error case the final result code NO CARRIER or CME ERROR :<error> is displayed. PS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

If no <cid> is given or if there is no matching context definition, the MT shall attempt to activate the context with whatever information is available to the MT. The other context parameters shall be set to their default values.

If the activation is successful, data transfer may proceed. After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.250 command state is re-entered and the MT returns the final result code OK.

Command	Description
Set	<p>[Function] Set command specifies the <L2P> and <cid> to establish data call (csd connection state)</p> <p>[Syntax] AT+CGDATA = [<L2P> ,<cid> [,<cid> [,...]]]</p> <p>[Response/Action] CONNECT It follows data transfer or CME ERROR: <error></p>
Read	N/A
Test	<p>[Function] Test command returns values supported as a compound value.</p> <p>[Syntax] AT+CGDATA =?</p> <p>[Response/Action] +CGDATA: (list of supported <L2P>s) OK</p>
Parameters	<L2P> a string parameter that indicates the layer 2 protocol to be used between the TE and MT


Command	Description
	<p>NULL none, for PDP type OSP: IHOSS (Obsolete)</p> <p>PPP Point-to-point protocol for a PDP such as IP</p> <p>PAD character stream for X.25 character (triple X PAD) mode (Obsolete)</p> <p>X25 X.25 L2 (LAPB) for X.25 packet mode (Obsolete).</p> <p>M-OPT-PPP MS supports manufacturing specific protocol</p> <p>M-HEX MS supports manufacturing specific protocol</p> <p>M-RAW_IP MS supports manufacturing specific protocol.</p> <p><cid> A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p>
Example	<pre>AT+CGDATA=ppp CONNECT AT+CGDATA=? +CGDATA: (PPP,M-OPT-PPP,M-HEX,M-RAW_IP,PAD,X25) OK</pre>
Reference	3GPP TS 27.007

11.2.16 +CGDSCONT, Define Secondary PDP Context

This command is used to define a secondary PDP context by specifying the PDP context parameter values for a <cid> (local context identification parameter). If the command is used only with the one parameter <cid>, it means that the corresponding PDP context becomes undefined.

Command	Description
Set	<p>[Function]</p> <p>Set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>.</p> <p>[Syntax]</p> <pre>AT+CGDSCONT=[<cid>, <p_cid> [,<d_comp>],<h_comp> [,<IM_CN_Signaling_Flag_Ind>]]]</pre> <p>[Response/Action]</p> <p>OK</p>

Command	Description
	<p>Or ERROR</p>
Read	<p>[Function] Read command returns the current settings for each defined context.</p> <p>[Syntax] AT+CGDSCONT?</p> <p>[Response/Action] +CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp> [,<IM_CN_Signaling_Flag_Ind>] OK</p>
Test	<p>[Function] Test command returns values supported as a compound value.</p> <p>[Syntax] AT+CGDSCONT=?</p> <p>[Response/Action] +CGDSCONT: (range of <cid>s),(list of <cid>s for defined primary contexts),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s) ,(list of supported <IM_CN_Signaling_Flag_Ind>s) [<CR><LF>+CGDSCONT: (range of <cid>s),(list of <cid>s for defined primary contexts),<PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s) ,(list of supported <IM_CN_Signaling_Flag_Ind>s) [...]] <d_comp>s),(list of supported <h_comp>s) [...]] OK</p>
Parameters	<p><cid> (PDP Context identifier) It is a numeric parameter, 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 the permitted values is 0-29.</p> <p><p_cid> (Primary PDP context identifier) It is a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.</p>

Command	Description
	<p><d_comp> (A numeric parameter that controls PDP data compression (applicable for SNDCP only))</p> <p>0 off (default if value is omitted)</p> <p>1 on (manufacturer preferred compression)</p> <p>2 V.42 bis</p> <p>Other values are reserved.</p> <p><h_comp> (A numeric parameter that controls PDP header compression)</p> <p>0 off (default if value is omitted)</p> <p>1 on (manufacturer preferred compression)</p> <p>2 RFC1144 (applicable for SNDCP only)</p> <p>3 RFC2507</p> <p>4 RFC3095 (applicable for PDCP only)</p> <p>Other values are reserved.</p> <p><IM_CN_Signaling_Flag_Ind></p> <p>a numeric parameter used to indicate to the network whether the PDP context is for IM CN subsystem-related signaling only or not.</p> <p>0 UE indicates that the PDP context is not for IM CN subsystem-related Signaling only</p> <p>1 UE indicates that the PDP context is for IM CN subsystem-related Signaling only</p> <p> Note: The parameter <IM_CN_Signaling_Flag_Ind> , can be over-ridden by AT+XPCO command (meaning AT+CGDSCONT values for these parameters can be over-ridden by issuing AT+XPCO later).</p>
Example	
Reference	3GPP TS 27.007

11.2.17 +CGEREP, Packet Domain Event Reporting

This command is used to enable or disable sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of events occurring in the Packet Domain.

Command	Description
Set	<p>[Function]</p> <p>The 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.</p>

Command	Description
	<p>[Syntax] AT+CGEREP=[<mode>[,<bfr>]]</p> <p>[Response/Action] OK</p>
Read	<p>[Function] The read command returns the current value of <mode> and <bfr> parameters.</p> <p>[Syntax] AT+CGEREP?</p> <p>[Response/Action] +CGEREP: <mode>, <bfr> OK</p>
Test	<p>[Function] The test command lists the supported values for <mode> and for <bfr>.</p> <p>[Syntax] AT+CGEREP=?</p> <p>[Response/Action] +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK</p>
Parameters	<p><mode></p> <p>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.</p> <p>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</p> <p>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</p> <p><bfr></p>

Command	Description
	ERROR
Read	<p>[Function] The read command returns the current settings for all Packet Filters for each defined context.</p> <p>[Syntax] AT+CGTFT?</p> <p>[Response/Action] +CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)> , <direction>,<local address and subnet mask> [<cr><lf> </cr><lf> +CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)> , <direction>,<local address and subnet mask> [...]]</p>
Test	<p>[Function] The test command returns values supported as a compound value.</p> <p>[Syntax] AT+CGTFT=?</p> <p>[Response/Action] +CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s) , (list of supported <direction>s) ,(list of</p>

Command	Description
	<p>supported <local address and subnet mask>s)</p> <p>[<CR><LF>+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s) ,(list of supported <local address and subnet mask>s)[...]]</p>
Parameters	<p><cid> a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p> <p><packet filter identifier> Numeric parameter, value range from 1 to 16.</p> <p><source address and subnet mask> Consists of dot-separated numeric (0-255) parameters on the form 'a1.a2.a3.a4.m1.m2.m3.m4', for Ipv4 and '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.</p> <p><protocol number (ipv4) / next header (ipv6)> Numeric parameter, value range from 0 to 255.</p> <p><destination port range> Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.</p> <p><source port range> Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.</p> <p><ipsec security parameter index (spi)> Hexadecimal parameter, value range from 00000000 to FFFFFFFF</p> <p><type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> Dot-separated numeric (0-255) parameters on the form 't.m</p> <p><flow label (ipv6)> Hexadecimal parameter, value range from 00000 to FFFFF. Valid for Ipv6 only.</p> <p><evaluation precedence index> Numeric parameter, value range from 0 to 255</p> <p><direction>: a numeric parameter which specifies the transmission direction in which the packet filter shall be applied.</p> <p>0 Pre-Release 7 TFT filter (see 3GPP TS 24.008 [8], table 10.5.162)</p>

Command	Description
	<p>+CGEV: NW DETACH</p> <p>The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. ETSI 3GPP TS 27.007 version 7.6.0 Release 7 147 ETSI TS 127 007 V7.6.0 (2010-04)</p> <p>+CGEV: ME DETACH</p> <p>The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.</p> <p>+CGEV: NW CLASS <class></p> <p>The network has forced a change of MT class. The highest available <class> is reported (see +CGCLASS).</p> <p>+CGEV: ME CLASS <class></p> <p>The mobile termination has forced a change of MT class. The highest available <class> is reported (see +CGCLASS).</p> <p>+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]]</p> <p>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>, <cid_other> are found in command +CGDCONT.</p> <p><reason> integer type parameter 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> <p>0 IPv4 only allowed 1 IPv6 only allowed 2 single address bearers only allowed. 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.</p>
Example	AT+CGEREP=2,1

Command	Description
	+CGEV: ME CLASS B +CGEV: NW CLASS A +CGEV: NW MODIFY 20,2,0 +CGEV: NW DETACH +CGEV: ME PDN ACT 2 OK

11.2.20 +CGPIAF , Printing IP Address Format

This 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:

^ in +CGTFT and +CGTFTTRDP, the <remote address and subnet mask >;

^ in +CGDCONT, the <PDP_addr>;

^ in +CGPADDR, the <PDP_addr_1> and <PDP_addr_2>;

^ in +CGCONTRDP, the <local address and subnet mask>, <DNS_prim_addr>, <DNS_sec_addr>, <P_CSCF_prim_addr> and <P_CSCF_sec_addr>;

^ in +CRC, the <PDP_addr> of unsolicited result code GPRS <PDP_type>, <PDP_addr>[,<L2P>][,<APN>]].

^ in +XDNS, the <primary_DNS>, <secondary_DNS> of XDNS Read response.

Command	Description
Set	<p>[Function] This command decides what format to print IPV6 address parameters of other AT commands.</p> <p>[Syntax] AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressZeros>]]]]</p> <p>[Response/Action] OK or CME ERROR: <error></p>

Command	Description
Read	<p>[Function] Read command returns the current command parameter settings.</p> <p>[Syntax] AT+CGPIAF?</p> <p>[Response/Action] +CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros></p>
Test	<p>[Function] Test command returns values supported as compound values.</p> <p>[Syntax] AT+CGPIAF=?</p> <p>[Response/Action] +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)</p>
Parameters	<p><IPv6_AddressFormat> Integer type, decides the IPv6 address format. Relevant for all AT command parameters that can hold an IPv6 address.</p> <p>0 Use IPv4-like dot-notation. IP address, and subnetwork mask if applicable, are dot-separated. Example: For <remote address and subnet mask>: "32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.0.0.255.255.255.255.255.255.240.0.0.0.0.0.0.0"</p> <p>For other IP address parameters: "32.1.13.184.0.0.205.48.0.0.0.0.0.0.0"</p> <p>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"</p> <p>For other IP address parameters: "2001:0DB8:0000:CD30:0000:0000:0000:0000"</p> <p><IPv6_SubnetNotation> Integer type, decides the subnet-notation for remote address and subnet mask. Setting does not apply if <IPv6_AddressFormat> = 0.</p>

Command	Description
	<p>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"</p> <p>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"</p> <p><IPv6_LeadingZeros> Integer type, decides whether leading zeros are omitted or not. Setting does not apply if <IPv6_AddressFormat> = 0.</p> <p>0 Leading zeros are omitted. Example: "2001:DB8:0:CD30:0:0:0:0"</p> <p>1 Leading zeros are included. Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000"</p> <p><IPv6_CompressZeros> Integer type, 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.</p> <p>0 No zero compression. Example: "2001:DB8:0:CD30:0:0:0:0"</p> <p>1 Use zero compression. Example: "2001:DB8:0:CD30::"</p> <p>If the address is unspecified (all bytes are zeroes), "::" will be displayed.</p>
Example	<pre>AT+CGPIAF=1,1,0,0 OK AT+CGPADDR=1 +CGPADDR: 1,"10.24.128.144","FE80:0:0:0:4A30:981E:AC7A:DC1C" OK AT+CGPIAF=1,1,1,0 OK AT+CGPADDR=1 +CGPADDR: 1,"10.24.128.144","FE80:0000:0000:0000:4A30:981E:AC7A:DC1C" OK AT+CGPIAF=0</pre>


Command	Description
	OK AT+CGPADDR=1 +CGPADDR: 1,"10.24.128.144","254.128.0.0.0.0.0.0.74.48.152.30.172.122.220.28" OK
Reference	3GPP TS 27.007

11.2.21 +CGCONTRDP, PDP Context Read Dynamic Parameters

Command	Description
Set	<p>[Function]</p> <p>The set command returns the relevant information about <bearer_id>, <apn>, <source_addr and subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr> and <IM_CN_Signalling_Flag> for a non secondary PDP Context established by the network with the primary context identifier <cid>. If the context cannot be found an ERROR response is returned. If the MT has dual stack capabilities, two lines of information are returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If the parameter <cid> is omitted, the relevant information for all established PDP contexts are returned.</p> <p>[Syntax]</p> <p>AT+CGCONTRDP= [<cid>]</p> <p>[Response/Action]</p> <p>+CGCONTRDP: <cid>, <bearer_id>, <apn> [,<source_addr and subnet_mask>[, <gw_addr>[, <DNS_prim_addr>[, <DNS_sec_addr>[, <PCSCF_prim_addr>[, <P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>]]]]]]]</p> <p>[<CR><LF>+CGCONTRDP: <cid>, <bearer_id>,<apn> [,<source_addr and subnet mask>[, <gw_addr>[, <DNS_prim_addr>[, <DNS_sec_addr>[, <P-CSCF_prim_addr>[, <P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>]]]]]]]</p> <p>[...]</p>
Read	N/A
Test	<p>[Function]</p> <p>The test command returns a list of <cid>s associated with active contexts</p> <p>[Syntax]</p>


Command	Description
	<p>AT+CGCONTRDP=?</p> <p>[Response/Action]</p> <p>+CGCONTRDP: (list of <cid>s associated with active contexts)</p>
Parameters	<p><cid>: a numeric parameter which 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.</p> <p><bearer_id>: a numeric parameter which identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.</p> <p><APN>: a string parameter which is a logical name that was used to select the GGSN or the external packet data network.</p> <p><source_addr and subnet_mask>: string type. It 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</p> <p><gw_addr>: a string parameter which shows the gateway address of the MT. The string is given as dot-separated numeric (0-255) parameters.</p> <p><DNS_prim_addr>: A string parameter which shows the IP address of the primary DNS server.</p> <p><DNS_sec_addr>: A string parameter which shows the IP address of the secondary DNS server.</p> <p><P_CSCF_prim_addr>: a string parameter which shows the IP address of the primary P-CSCF server.</p> <p><P_CSCF_sec_addr>: A string parameter which shows the IP address of the secondary P-CSCF server.</p> <p><IM_CN_Signalling_Flag>: A numeric parameter used to show whether the PDP context is for IM CN subsystem-</p>

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Command	Description
	<p>related signalling only or not.</p> <p>0 PDP context is not for IM CN subsystem-related signalling only</p> <p>1 PDP context is for IM CN subsystem-related signalling only</p> <p> Note : <IM_CN_Signalling_Flag> parameter is supported only from release 10.</p> <p>Note 1: This command is available only from release 8.</p> <p>Note 2: IPv6 addresses obtained on LTE will be prefixed with a constant 8 byte address. "FE.80.00.00.00.00.00" if network has not provided.</p>
Example	<pre>AT+CGCONTRDP=? +CGCONTRDP: 1 OK AT+CGCONTRDP=1 +CGCONTRDP: 1,5,"3gnet.MNC001.MCC460.GPRS","10.232.80.122.255.0.0.0","10.232.80.123","210. 21.196.6","0.0.0.0","0.0.0.0","0.0.0.0" OK AT+CGDCONT? +CGDCONT: 1,"IP","3gnet.MNC001.MCC460.GPRS","10.232.80.122",0,0,0,0,0 OK</pre>
Reference	3GPP TS 27.007

11.2.22 +CGSCONTRDP, PDP Context Read Dynamic Parameters

Command	Description
Set	<p>[Function]</p> <p>This execution command returns <p_cid>, <bearer_id> and <IM_CN_Signalling_Flag> for a given <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the <cid>, <p_cid>, <bearer_id> and <IM_CN_Signalling_Flag> are returned for all established PDP contexts.</p> <p>[Syntax]</p> <p>AT+CGSCONTRDP= [<cid>]</p> <p>[Response/Action]</p>


Command	Description
	+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>] [<CR><LF>+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>] [...]]
Read	N/A
Test	<p>[Function] The test command returns a list of <cid>s associated with active contexts</p> <p>[Syntax] AT+CGSCONTRDP=?</p> <p>[Response/Action] +CGSCONTRDP: (list of <cid>s associated with active contexts)</p>
Parameters	<p><cid>: a numeric parameter which specifies a particular PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands.</p> <p><p_cid>: a numeric parameter which 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.</p> <p><bearer_id>: a numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.</p> <p><IM_CN_Signalling_Flag>: A numeric parameter used to show whether the PDP context is for IM CN subsystem-related signalling only or not. 0 PDP context is not for IM CN subsystem-related signalling only 1 PDP context is for IM CN subsystem-related signalling only</p> <p> Note : <IM_CN_Signalling_Flag> parameter is supported only from release 10.</p> <p>Note 1: Parameters for network initiated PDP contexts are returned as well. The dynamic part of the PDP context will only exist if established by the network.</p>

Command	Description
	Note 2: This command is available only from release 8.
Example	
Reference	3GPP TS 27.007


11.2.23 +CGTFTRDP, Traffic Flow Template Read Dynamic Parameters

This command returns the relevant information about Traffic Flow Template of <cid> together with the additional network assigned values when established by the network.

Command	Description
Set	<p>[Function] The execution command returns the relevant information about Traffic Flow Template of <cid> together with the additional network assigned values when established by the network. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the Traffic Flow Templates for all established PDP contexts are returned. Parameters of both network and MT/TA initiated PDP contexts will be returned.</p> <p>[Syntax] AT+CGTFTRDP= [<cid>]</p> <p>[Response/Action] +CGTFTRDP: <cid>, <packet filter identifier>, <evaluation available index>, <source address and vaila mask>, <protocol vaila (ipv4) / next header(ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>, <NW packet filter Identifier>[<CR><LF>+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation available index>, <source address and vaila mask>, <protocol vaila (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>, <NW packet filter Identifier> [...]]</p>
Read	N/A
Test	<p>[Function] The test command returns a list of <cid>s associated with active contexts</p>

Command	Description
	<p>[Syntax] AT+CGTFTRDP=?</p> <p>[Response/Action] +CGTFTRDP: (list of <cid>s associated with active contexts)</p>
Parameters	<p><cid>: a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands). The following parameters are defined in 3GPP TS 23.060 [47]</p> <p><packet filter identifier>: a numeric parameter. The value range is from 1 to 16.</p> <p><evaluation precedence index>: a numeric parameter. The value range is from 0 to 255.</p> <p><source address and subnet mask>: string type. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for Ipv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for Ipv6.</p> <p> Note: IPv6 address obtained on LTE will be prefixed with a constant 8 byte address "FE.80.00.00.00.00.00" if network has not provided.</p> <p><protocol number (ipv4) / next header (ipv6)>: a numeric parameter, value range from 0 to 255.</p> <p><destination port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".</p> <p><source port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".</p> <p><ipsec security parameter index (spi)>: numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.</p> <p><type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>:</p>

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Command	Description
	<p>string type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".</p> <p><flow label (ipv6)>: numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for Ipv6 only.</p> <p><direction>: a numeric parameter which specifies the transmission direction in which the Packet Filter shall be applied. 0 Pre Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162)</p> <p>1 Uplink 2 Downlink 3 Bidirectional (Used for Uplink and Downlink)</p> <p><NW packet filter Identifier>: a numeric parameter. The value range is from 1 to 16. In EPS the value is assigned by the network when established.</p> <p> Note 1: 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.</p> <p>Note 2: This command is available only from release 8.</p>
Example	<pre> AT+CGDCONT? +CGDCONT: 20,"IP","3gnet.MNC001.MCC460.GPRS","10.224.166.65",0,0 +CGDCONT: 1,"IP","3GNET","10.230.219.186",0,0,0,0,0 OK AT+CGTFTRDP=? +CGTFTRDP: 20,1 OK AT+CGTFTRDP=1 +CGTFTRDP: 0, 0, 0, "0.0.0.0.0.0.0", 0, 0.0, 0.0, 00000000, 0.0, 00000, 0, 0 OK AT+CGTFTRDP=20 +CGTFTRDP: 0, 0, 0, "0.0.0.0.0.0.0", 0, 0.0, 0.0, 00000000, 0.0, 00000, 0, 0 OK </pre>
Reference	3GPP TS 27.007

11.2.24 +CSCON, Signalling Connection Status

The set command controls the presentation of an unsolicited result code +CSCON. If <n>=1, +CSCON:<mode> is sent from the MT when the connection mode of the MT is changed. If <n>=2 and there is a state within the current mode, +CSCON:<mode>[,<state>] is sent from the MT. When the MT is in UTRAN or E-UTRAN, the mode of the MT refers to idle when no PS signalling connection and to connected mode when a PS signalling connection between UE and network is setup. When the UE is in GERAN, the mode refers to idle when the MT is in either the IDLE state or the STANDBY state and to connected mode when the MT is in READY state. The <state> value indicates the state of the MT when the MT is in UTRAN connected mode.

The read command returns the status of result code presentation and an integer <mode> which shows whether the MT is currently in idle mode or connected mode. State information <state> is returned only when <n>=2.

Test command returns supported values as compound value.

Command	Description
Set	<p>[Function] The set command controls the presentation of an unsolicited result code +CSCON.</p> <p>[Syntax] AT+CSCON=[<n>]</p> <p>[Response/Action] OK or +CME ERROR: <err></p>
Read	<p>[Function] The read command returns the status of result code presentation and an integer <mode> which shows whether the MT is currently in idle mode or connected mode.</p> <p>[Syntax] AT+CSCON?</p> <p>[Response/Action] +CSCON: : <n>,<mode>[,<state>]</p>

Command	Description
	OK
Test	<p>[Function] Test command returns supported values as compound value.</p> <p>[Syntax] AT+CSCON=?</p> <p>[Response/Action] +CSCON: (0-3) OK</p>
Parameters	<p><n>:integer type Enables or disables the presentation of an unsolicited result code</p> <p>0 disable unsolicited result code. (default) 1 enable unsolicited result code +CSCON: <mode>. 2 enable unsolicited result code +CSCON: <mode>[,<state>]. 3 enable unsolicited result code +CSCON: <mode>[,<state>[,<access>]]</p> <p><mode>:integer type indicates the signalling connection status</p> <p>0 idle 1 connected.</p> <p><state>: integer type indicates the CS or PS state while in GERAN and the RRC state information if the MT is in connected Mode while in UTRAN and E-UTRAN.</p> <p>0 UTRAN URA_PCH state 1 UTRAN Cell_PCH state 2 UTRAN Cell_FACH state 3 UTRAN Cell_DCH state 4 GERAN CS connected state 5 GERAN PS connected state 6 GERAN CS and PS connected state 7 E-UTRAN connected state</p> <p><access>: Integer type; indicates the current radio access type.</p>

Command	Description
	<p>0 Indicates usage of radio access of type GERAN, see 3GPP TS 45.001 [146].</p> <p>1 Indicates usage of radio access of type UTRAN TDD, see 3GPP TS 25.212 [144].</p> <p>2 Indicates usage of radio access of type UTRAN FDD, see 3GPP TS 25.212 [144].</p> <p>3 Indicates usage of radio access of type E-UTRAN TDD, see 3GPP TS 36.300 [145].</p> <p>4 Indicates usage of radio access of type E-UTRAN FDD, see 3GPP TS 36.300 [145].</p>
Example	<pre>AT+CSCON=? +CSCON: (0-3) OK AT+CSCON? +CSCON: 0,0,0 OK AT+CSCON=1 OK AT+CSCON? +CSCON: 1,0,0 OK</pre>
Reference	3GPP TS 27.007

11.2.25 +CGEQOS, Define EPS Quality Of Service

Command	Description
Set	<p>[Function]</p> <p>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.</p> <p>When in UMTS/GPRS the MT applies a mapping function to UTM/GPRS Quality of Service. A special form of the set command, +CGEQOS= <cid> causes the values for context number <cid> to become undefined.</p> <p>[Syntax]</p> <pre>AT+CGEQOS=[<cid> [,<QCI> [,<DL_GBR>,<UL_GBR> [,<DL_MBR>,<UL_MBR>]]]]</pre> <p>[Response/Action]</p> <p>OK</p>

Command	Description
	<p>or</p> <p>+CME ERROR: <err></p>
Read	<p>[Function]</p> <p>The read command returns the current settings for each defined QoS.</p> <p>[Syntax]</p> <p>AT+CGEQOS?</p> <p>[Response/Action]</p> <p>+CGEQOS: <cid>, <QCI>, [<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>] [<CR>>LF]+CGEQOS: <cid>, <QCI>, [<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>] [...]]</p>
Test	<p>[Function]</p> <p>The test command returns the ranges of the supported parameters.</p> <p>[Syntax]</p> <p>AT+CGEQOS=?</p> <p>[Response/Action]</p> <p>+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)</p>
Parameters	<p><cid>:</p> <p>a numeric parameter which specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS.</p> <p><QCI>:</p> <p>a numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [85]) 0 QCI is selected by network</p> <p>[1-4] value range for guaranteed bit rate Traffic Flows</p> <p>[5-9] value range for non-guaranteed bit rate Traffic Flows</p> <p><DL_GBR>:</p>

Command	Description
	<p>a numeric parameter which 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])</p> <p><UL_GBR>:</p> <p>a numeric parameter which 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])</p> <p><DL_MBR>:</p> <p>a numeric parameter which 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])</p> <p><UL_MBR>:</p> <p>a numeric parameter which 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])</p> <p>Note: This command is available only from release 8.</p>
Example	
Reference	3GPP TS 27.007

12 Fibocom Proprietary Commands

12.1 Set Profile Commands

12.1.1 +GTMCFWVER, Get Original FW Version

Command	Description
Set	<p>[Function] N/A</p> <p>[Syntax] N/A</p> <p>[Response/Action] N/A</p>
Read	<p>[Function] This command is used to get original FW version.</p> <p>[Syntax] AT+GTMCFWVER?</p>

Command	Description
	<p>[Response/Action] +GTMCFWVER: <version> OK</p>
Test	<p>[Function] N/A</p> <p>[Syntax] N/A</p> <p>[Response/Action] N/A</p>
Parameters	<p><version> Return FW version.</p>
Example	<p>AT+ GTMCFWVER? +GTMCFWVER: "18500.5001.00.01.00.01" OK</p>

13 Multi-Config Commands

These commands allow the user to query the information of the firmware, the operator supported by the firmware. Please refer to the manual as below. (Only for internal use)

No.	Name	Version
1	FIBOCOM AT Commands User Manual_Multi-Carrier_V1.0.5.docx (Only Chapter Five)	V1.0.5

14 GNSS Commands

These commands are used to configuration location service. Please refer to the manual as below. (Only for internal use)

No.	Name	Version
1	FIBOCOM AT Commands User Manual_GNSS_V1.0.1.docx	V1.0.1

15 SAR Commands

These commands allow the user to query and set parameters related to BODY SAR&RTSAR functionality. Please refer to the manual as below.

No.	Name	Version
1	FIBOCOM AT Commands User Manual_SAR_V1.0.1.docx	V1.0.1

16 RF Commands


These commands are used for RF configuration. Please refer to the manual as below. (Only for internal use)

No.	Name	Version
1	FIBOCOM AT Commands User Manual_RF_V1.0.1.docx	V1.0.1

17 Error Code

17.1 CME Error

Parameter	Description
<Err>	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"

Parameter	Description
	17, "SIM PIN2 required"
	18, "SIM PUK2 required"
	19, "incorrect PUK1"
	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"
	40, "network personalisation PIN required"
	41, "network personalisation PUK required"
	42, "network subset personalisation PIN required"
	43, "network subset personalisation PUK required"
	44, "service provider personalisation PIN required"
	45, "service provider personalisation PUK required"
	46, "corporate personalisation PIN required"
	47, "corporate personalisation PUK required"
	48, "hidden key required"
	 Note: This key is required when accessing hidden phone book entries.)
	49, "EAP method not supported"
	50, "Incorrect parameters"
	100, "unknown"
	103, "Illegal MS"
	106, "Illegal ME"
	107, "GPRS services not allowed"
	111, "PLMN not allowed"
	112, "location area not allowed"
	113, "roaming not allowed in this location area"
	114, "GPRS services not allowed in this PLMN"
	116, "MSC temporarily not reachable"
	117, "Network failure"

Parameter	Description
	132, "Service not supported"
	133, "Service not subscribed"
	134, "service option temporarily out of order"
	135, "NS-api already used"
	148, "Unspecified GPRS error"
	149, "PDP authentication error"
	150, "invalid mobile class"
	244, "Attach failure"
	257, "Invalid error mapping"
	258, "APN not listed in APN Control List (ACL)"
	701, "incorrect security code"
	702, "max attempts reached"
	1001, "Unassigned (unallocated) number"
	1003, "No route to destination"
	1006, "Channel unacceptable"
	1008, "Operator determined barring"
	1016, "Normal call clearing"
	1017, "User busy"
	1018, "No user responding"
	1019, "User alerting, no answer"
	1021, "Call rejected"
	1022, "Number changed"
	1026, "Non selected user clearing"
	1027, "Destination out of order"
	1028, "Invalid number format (incomplete number)"
	1029, "Facility rejected"
	1030, "Response to STATUS ENQUIRY"
	1031, "Normal, unspecified"
	1034, "No circuit/channel available"
	1038, "Network out of order"
	1041, "Temporary failure"
	1042, "Switching equipment congestion"
	1043, "Access information discarded"
	1044, "requested circuit/channel not available"
	1047, "Resources unavailable, unspecified"
	1049, "Quality of service unavailable"
	1050, "Requested facility not subscribed"

Parameter	Description
	1055, "Incoming calls barred within the CUG"
	1057, "Bearer capability not authorized"
	1058, "Bearer capability not presently available"
	1063, "Service or option not available, unspecified"
	1065, "Bearer service not implemented"
	1068, "ACM equal to or greater than ACMmax"
	1069, "Requested facility not implemented"
	1070, "Only restr. digital information bearer capability"
	1079, "Service or option not implemented, unspecified"
	1081, "Invalid transaction identifier value"
	1087, "User not member of CUG"
	1088, "Incompatible destination"
	1091, "Invalid transit network selection"
	1095, "Semantically incorrect message"
	1096, "Invalid mandatory information"
	1097, "Message type non-existent or not implemented"
	1098, "Message type not compatible with protocol state"
	1099, "Information element non-existent or not implemented"
	1100, "Conditional IE error"
	1101, "Message not compatible with protocol state"
	1102, "Recovery on timer expiry"
	1111, "Protocol error, unspecified"
	1127, "Interworking, unspecified"
	1279, "Number not allowed"
	1283, "CCBS possible"

17.2 CMS Error

Parameter	Description
<Err>	1, "Unassigned (unallocated) number"
	8, "Operator determined barring"
	10, "Call barred"
	17, "Network failure"
	21, "Short message transfer rejected"
	22, "Memory capacity exceeded"
	27, "Destination out of service"

Parameter	Description
	28, "Unidentified subscriber"
	29, "Facility rejected"
	30, "Unknown Subscriber"
	38, "Network out of order"
	41, "Temporary failure"
	42, "Congestion"
	47, "Resources unavailable, unspecified"
	50, "Requested facility not subscribed"
	69, "Requested facility not implemented"
	81, "Invalid short message reference value"
	95, "Invalid message, unspecified"
	96, "Invalid mandatory information"
	97, "Message type non-existent or not implemented"
	98, "Message not compatible with short message protocol state"
	99, "Information element non-existent or not implemented"
	111, "Protocol error, unspecified"
	127, "Interworking unspecified"
	128, "Telematic interworking not supported"
	129, "Short message type 0 not supported"
	130, "Cannot replace short message"
	143, "Unspecified TP-PID error"
	144, "Data coding scheme (alphabet) not supported"
	145, "Message class not supported"
	159, "Unspecified TP-DCS error"
	160, "Command cannot be action"
	161, "Command unsupported"
	175, "Unspecified TP-Command error"
	176, "TPDU not supported"
	192, "SC busy"
	193, "No SC subscription"
	194, "SC system failure"
	195, "Invalid SME address"
	196, "Destination SME barred"
	197, "SM Rejected-Duplicate SM"
	198, "TP-VPF not supported"
	199, "TP-VP not supported"
	208, "SIM SMS storage full"

Parameter	Description
	209, "No SMS storage capability in SIM"
	210, "Error in MS"
	211, "Memory Capacity Exceeded"
	212, "SIM Application Toolkit Busy"
	213, "SIM data download error"
	224, "TP_FCS_APPL_ERR_START"
	254, "TP_FCS_APPL_ERR_STOP"
	255, "TP_FCS_UNSPECIFIED"
	300, "ME failure"
	301, "SMS service of ME reserved"
	302, "operation not allowed"
	303, "operation not supported"
	304, "Invalid PDU mode param"
	305, "invalid text mode parameter"
	310, "SIM not inserted"
	311, "SIM PIN required"
	312, "PH-SIM PIN necessary"
	313, "SIM failure"
	314, "SIM busy"
	315, "SIM wrong"
	317, "SIM PIN2 required"
	318, "SIM PUK2 required"
	319, "incorrect PUK1"
	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"
	512, "MN_SMS_RP_ACK"
	513, "MN_SMS_TIMER_EXPIRED"
	514, "MN_SMS_FORW_AVAIL_FAILED"
	515, "MN_SMS_FORW_AVAIL_ABORTED"
	516, "MS invalid TP-Message-Type-Indicator"
	517, "MS no TP-Status-Report in Phase 1"
	518, "MS no TP-Reject-Duplicate in Phase 1"

Parameter	Description
	519, "MS no TP-Reply-Path in Phase 1"
	520, "MS no TP-User-Data-Header in Phase 1"
	521, "MS missing TP-Validity-Period"
	522, "MS invalid TP-Service-Centre-Time-Stamp"
	523, "MS missing TP-Destination-Address"
	524, "MS invalid TP-Destination-Address"
	525, "MS missing Service-Centre-Address"
	526, "MS invalid Service-Centre-Address"
	527, "MS invalid alphabet"
	528, "MS invalid TP-User-Data-Length"
	529, "MS missing TP-User-Data"
	530, "MS TP-User-Data too long"
	531, "MS no Command-Request in Phase 1"
	532, "MS Cmd-Req invalid TP-Destination-Address"
	533, "MS Cmd-Req invalid TP-User-Data-Length"
	534, "MS Cmd-Req invalid TP-User-Data"
	535, "MS Cmd-Req invalid TP-Command-Type"
	536, "MN MNR creation failed"
	537, "MS CMM creation failed"
	538, "MS network connection lost"
	539, "MS pending MO SM transfer"
	540, "RP-Error OK"
	541, "RP-Error OK no icon display"
	542, "SMS-PP Unspecified"
	543, "SMS rejected By SMS CONTROL"