

# ML302

# AT Commands Reference Guide

4G LTE Series

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# Support Information

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## China Mobile IoT Co. Ltd.

Website: [iot.10086.cn](http://iot.10086.cn)

Email: [SmartModule@cmiot.chinamobile.com](mailto:SmartModule@cmiot.chinamobile.com)

Customer Service Hotline: 400-110-0866

WeChat Official Account: OneMO2019



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China Mobile

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# Revision History

Version	Release Date	Author	Summary of Change
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# 1 About the Document

## 1.1 Scope of Application

The AT command set in this document applies to the China Mobile IoT ML302 module.

## 1.2 Command Syntax

Each command must start with "AT" or "at" and end with <CR>. After the command is sent successfully, it usually includes a response message with <CR> <LF> response <CR> <LF>. The AT command set implemented by the ML302 module contains the 3GPP TS 27.007, 3GPP TS 27.005 and ITU-T V.25ter standard command sets. The AT commands are grouped into 3 categories according to their syntax structure: basic syntax, S- parameter syntax, and extended syntax.

### ■ Basic Syntax

In basic syntax, the AT command format is either "AT<x><n>" or "AT&<x><n>", where "<x>" is the command and "<n>" is the command parameter. For example, in the command "ATE <n>", as per the value of <n>, the command determines whether returns the characters received to DTE. "<n>" is optional, use the default value when "<n>" is absent.

### ■ S- Parameter Syntax

The format of S- Parameter command is "ATS<n>=<m>", where "<n>" sets the S register index, and "<m>" is the set value.

### ■ Extended Syntax

This command has multiple operation modes, as shown in the following table:

**Table 1-1: AT Command Type and Response**

<b>Test command</b>	AT+<x>=?	This type of commands returns a list of parameters and the range of the parameter values.
<b>Read command</b>	AT+<x>?	This type of commands returns the current value of the parameter
<b>Set command</b>	AT+<x>=<...>	This type of command sets the parameter value
<b>Execute command</b>	AT+<x>	This type of command reads the value of the non-variable parameter in the UE device.

## 1.3 Character Set Supported

The ML302 AT command supports the GSM character set by default and supports the following character sets:

- **GSM format**
- **UCS2**
- **HEX**
- **PCCP936**

The character set is set and queried by the AT+CSCS commands (3GPP TS27.007). The character set affects the sending and receiving of SMS (SMS) and SMS broadcast messages, as well as the display and saving of the phone contact content.

## 1.4 AT Command Interface

The ML302 AT command interface consists of one USB ports and one main serial port. AT command communication and data transmission are supported between the main serial port and one USB ports.

## 1.5 URC

URC is not the result of the AT command execution. It does not require the TE request automatically pushed by the module in the event of a specific event. Typical URC events include incoming calls, incoming short messages, high/low voltage alarms, high/low temperature alarms, and so on.

## 2 General Commands

### 2.1 A/ Repeat the Previous Command

A/	
Syntax	
<b>Execute Command</b> A/	<b>Possible Returns:</b> Repeat the previous command
Command Description	
A/ Repeat the previous AT command. "/" is the terminator.	
Example	
<b>AT+GMI</b> CMCC OK  <b>A/</b> CMCC OK	

### 2.2 AT+CPOF Switch off Mobile Station

AT+CPOF	
Syntax	
<b>Test Command</b> AT+CPOF=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CPOF	<b>Possible Returns:</b> +CPOF: MS OFF OK
Command Description	
Device will be switched off (power down mode). Do not send any command after this command.	
Example	
<b>AT+CPOF</b> +CPOF: MS OFF OK	
//Device will be switched off (power down mode)	

## 2.3 ATSO Automatic Answering

ATSO	
Syntax	
<b>Test Command</b> ATSO=?	<b>Possible Returns:</b> 0-255 OK
<b>Read Command</b> ATSO?	<b>Possible Returns:</b> <n> OK
<b>Set Command</b> ATSO=<n>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This S-parameter controls the automatic answering feature of the DCE. If set to 0, automatic answering is disabled. If set to a non-zero value, the DCE shall cause the DCE to answer when the incoming call ringing has occurred the number of times indicated by the value.	
Parameter Description	
<n>	
The auto answering times, range from 0~255.	
Remark	
If set to 0, auto answering is disabled. This command is specially used on data service in GPRS mode.	
Example	
<b>ATSO=2</b> OK <b>ATSO?</b> 2 OK	

## 2.4 ATS3 Set Command Terminator

ATS3	
Syntax	
<b>Read Command</b> ATS3?	<b>Possible Returns:</b> <n> OK
<b>Set Command</b> ATS3=<n>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter.	
Parameter Description	
<n>	
Number format, Command line termination character 0~31. (Default value is 13)	
Remark	
If ATS3, ATS4, ATS5 be set to the same value, it may be causing some problem.	
Example	
<b>ATS3?</b> 13 OK	



## 2.5 ATS4 Response Formatting Character

ATS4	
Syntax	
<b>Read Command</b> ATS4?	<b>Possible Returns:</b> <n> OK
<b>Set Command</b> ATS4=<n>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter.	
Parameter Description	
<n>	
Number format, Command line termination character 0~31. (Default value is 10)	
Remark	
If ATS3, ATS4, ATS5 be set to the same value, it may be causing some problem.	
Example	
<b>ATS4?</b> 10 OK	

## 2.6 ATS5 Command Line Editing Character

ATS5	
Syntax	
<b>Read Command</b> ATS5?	<b>Possible Returns:</b> <n> OK
<b>Set Command</b> ATS5=<n>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This S-parameter represents the decimal IA5 value of the character recognized by the DCE as request to delete from the command line the immediately preceding character.	
Parameter Description	
<n>	
Number format, Command line termination character 0~31. (default value is 8)	
Remark	
If ATS3, ATS4, ATS5 be set to the same value, it may be causing some problem.	
Example	
ATS5? 8 OK	

## 2.7 +++ Switch from Online Data or PPP Mode to Online CMD Mode

+++	
Syntax	
<b>Execute Command</b> +++	<b>Possible Returns:</b> OK
Command Description	
Return to online command state from online data state.	

## 2.8 AT&F Set All Current Parameters to Manufacturer Defaults

AT&F	
Syntax	
<b>Execute Command</b> AT&F[<value>]	<b>Possible Returns:</b> OK
Command Description	
This command instructs the DCE to set all parameters to default values specified by the manufacture, which may take hardware configuration switches and other manufacture-defined criteria into consideration.	
Parameter Description	
<value>	
0	Set all TA parameters to manufacturer defaults.
other	Reserved for manufacture proprietary use.
Remark	
<ul style="list-style-type: none"> <li>List of parameters reset to manufacturer default can be found in Section.</li> <li>In addition to the default profile, you can store an individual one with AT&amp;W. To alternate between the two profiles, enter either ATZ (loads user profile) or AT&amp;F (restores factory profile).</li> </ul>	
Example	
<b>AT&amp;F</b> OK	

## 2.9 ATV Set Result Code Format Mode

ATV	
Syntax	
<b>Execute Command</b> ATV[<value>]	<b>Possible Returns:</b> <b>If &lt;value&gt;=1 or empty</b> OK  <b>If &lt;value&gt;=0</b> 0
Command Description	
The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.	
Parameter Description	
<value>	
0	Information response: <text> <CR> <LF>. Short result code format: <numeric code> <CR>.
1	Information response: <CR> <LF> <text> <CR> <LF>. Long result code format: <CR> <LF> <verbose code> <CR> <LF>
Remark	
All references to CR mean "the character with the ordinal value specified in parameter S3"; all references to LF likewise mean "the character with the ordinal value specified in parameter S4".	
Example	
<b>ATV1</b> OK	

## 2.10 AT&W Stores Current Configuration to User Defined Profile

AT&W	
Syntax	
<b>Execute Command</b> AT&W[<value>]	<b>Possible Returns:</b> OK
Command Description	
This command stores the currently set parameters to a user defined profile in the non-volatile memory.	
Parameter Description	
<value>	
0	Profile number
Remark	
<ul style="list-style-type: none"> <li>The user defined profile will be restored automatically after power-up. Use ATZ to restore user profile and AT&amp;F to restore factory settings. Until the first use of AT&amp;W, ATZ works as AT&amp;F.</li> <li>A list of parameters stored to the user profile can be found in Section chapter 29, appendix B, AT Command Settings storable with AT&amp;W.</li> </ul>	
Example	
<b>AT&amp;W</b> OK	

## 2.11 ATQ Set Result Code Presentation Mode

ATQ	
Syntax	
<b>Execute Command</b> ATQ[<value>]	<b>Possible Returns:</b> <b>If &lt;value&gt;=0 or empty</b> OK  <b>If &lt;value&gt;=1</b> NULL
Command Description	
This parameter setting determines whether or not the DCE transmits result codes to the DTE.	
Parameter Description	
<value>	
0	DCE transmits result code.
1	Result codes are suppressed and not transmitted.
Example	
<b>ATQ0</b> OK	
<b>ATQ1</b>	

## 2.12 ATX Set Connect Result Code Format and Call Monitoring

ATX	
Syntax	
<b>Execute Command</b> ATX[<value>]	<b>Possible Returns:</b> OK
Command Description	
This parameter setting determines whether or not the DCE detects the presence of dial tone and busy signal and whether or not DCE transmits particular result codes.	
Parameter Description	
<value>	
0	CONNECT result code only returned; dial tone and busy detection are both disable.
1	CONNECT <text> result code only returned; dial tone and busy detection are both disable.
2	CONNECT <text> result code returned; dial tone detection is enabled; busy detection is disabled.
3	CONNECT <text> result code returned, dial tone detection is disabled, busy detection is enabled.
4 (Default value)	CONNECT <text> result code returned; dial tone and busy detection are both enabled.
Example	
ATX4	
OK	

## 2.13 ATZ Set All Current Parameters to User Defined Profile

ATZ	
Syntax	
<b>Execute Command</b> ATZ[<value>]	<b>Possible Returns:</b> OK
Command Description	
This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer.	
Parameter Description	
<scanseq> Number format, search order (e.g. 04030202 (LTE/WCDMA/TD-SCDMA/GSM))	
<b>0</b>	The default configures of the manufacturer
<b>other</b>	Not be used
Remark	
<ul style="list-style-type: none"> <li>First the profile will be set to factory default (see AT&amp;F). If there is a valid user profile (stored with AT&amp;W), this profile will be loaded afterwards.</li> <li>Any additional commands on the same command line may be ignored. A delay of 300 ms is required before next command is sent; otherwise "OK" response may be corrupted.</li> </ul>	



## 2.14 AT+CFUN Set Phone Functionality

AT+CFUN	
Syntax	
<b>Test Command</b> AT+CFUN=?	<b>Possible Returns:</b> +CFUN: (list of supported <fun>s),(list of supported <rst>s) OK
<b>Read Command</b> AT+CFUN?	<b>Possible Returns:</b> +CFUN: <fun> OK
<b>Set Command</b> AT+CFUN=<fun>[,<rst>]	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
Set command currently can only be used to switch off and on the CSW platform.	
Parameter Description	
<b>&lt;fun&gt;</b>	
0	Minimum functionality
1	Full functionality
4	Disable phone both transmit and receive RF circuits
<b>&lt;rst&gt;</b> This shall be always default when <rst> is not given.	
0	Do not reset the MT before setting it to <fun> power level (default value)
1	Reset the MT before setting it to <fun> power level
Remark	
<ul style="list-style-type: none"> <li>Currently, for &lt;fun&gt; parameter only 0、1 and 4 is supported, 1 and 4 will return the same result.</li> <li>When &lt;fun&gt; equals to 0 and 1, the second parameter &lt;rst&gt; is ignored.</li> <li>For CSW only do the de-registering when switch off, when parameter is set by 0 or 1, CSW will operate the network job independent.</li> <li>If AT modem can't register the network when parameter is set to 5, please check pin1 status.</li> </ul>	
Example	
<b>AT+CFUN=0</b> OK <b>AT+CFUN?</b> +CFUN: 0 OK	

## 2.15 AT+CMEE Report Mobile Equipment Error

AT+CMEE	
Syntax	
<b>Test Command</b> AT+CMEE=?	<b>Possible Returns:</b> +CMEE: (0-2) OK
<b>Read Command</b> AT+CMEE?	<b>Possible Returns:</b> +CMEE: <n> OK
<b>Set Command</b> AT+CMEE=<n>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command controls the presentation of the result code +CME ERROR: <err> that indicates errors relating to ME functionality.	
Parameter Description	
<n>	
0	Disable +CME ERROR: <err> code and use ERROR instead
1	Enable +CME ERROR: <err> code and use numeric <err> values (refer next sub clause)
2	Enable +CME ERROR: <err> result code and use verbose <err> values refer next sub clause)
Remark	
When enable the result code, MT related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.	
Example	
<b>AT+CMEE=1</b> OK <b>AT+CMEE?</b> +CMEE: 1 OK	

## 2.16 AT+CSCS Select TE Character Set

AT+CSCS	
Syntax	
<b>Test Command</b> AT+CSCS=?	<b>Possible Returns:</b> +CSCS: (list of supported < chset >s) OK
<b>Read Command</b> AT+CSCS?	<b>Possible returns:</b> +CSCS: (list of supported < chset >s) OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+CSCS=<chset>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
Write command informs DCE which character set <chset> is used by the TE. DCE is then able to convert character strings correctly between TE and ME character sets.	
Parameter Description	
<chset >	
<b>GSM</b>	GSM 7-bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF) problems.
<b>UCS2</b>	16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99.
<b>HEX</b>	Hexadecimal mode. No character set used; the user read or write directly hexadecimal values.
<b>PCCP936</b>	PC Set Chinese character.
Example	
AT+CSCS="UCS2" OK AT+CSCS? +CSCS: "UCS2" OK	

## 2.17 AT+CMUX Multiplexing Mode

AT+CMUX	
Syntax	
<b>Test Command</b> AT+CMUX=?	<b>Possible Returns:</b> +CMUX: (list of supported <transparency>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) OK
<b>Read Command</b> AT+CMUX?	<b>Possible returns:</b> +CMUX: <transparency>,[<subset>],<port_speed>,<N1>,<T1>,<N2>,<T2>,< T3>,<k>] OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+CMUX=<transparency>[,<subse t>[,<port_speed>[,<N1>[,<T1>[,<N 2>[,<T2>[,<T3>[,<k>]]]]]]]]	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command is used to enable the multiplexing protocol control channel.	
Parameter Description	
<transparency> Integer type (multiplexer Transparency Mechanism)	
0	Basic option
1	Advanced option
<subset> Integer type. This parameter defines the way in which the multiplexer control channel is set up. A virtual channel may subsequently be set up differently but in the absence of any negotiation for the settings of a virtual channel, the virtual channel shall be set up according to the control channel <subset> setting.	
0	UIH frames used only
<port_speed> Integer type (transmission rate). The default value is implementation specific.	
1	9600 bit/s
2	19200 bit/s
3	38400 bit/s
4	57600 bit/s
5	115200 bit/s
6	230400 bits/s
<N1> Integer type (maximum frame size)	
1- 2048	Where the 31 is default for Basic option and 64 is default for Advanced option (see <transparency>)

AT+CMUX	
Parameter Description	
<T1> Integer type (acknowledgement timer in units of ten milliseconds)	
1-255	Where 10 is default (100 ms)
<N2> Integer type (maximum number of re-transmissions)	
0-100	Where 3 is default
<T2> Integer type (response timer for the multiplexer control channel in units of ten milliseconds)	
2-255	Where 30 is default (300 ms)
<T3> Integer type (wake up response timer in seconds)	
1-255	Where 10 is default
<K> Integer type (window size, for Advanced option with Error-Recovery Mode)	
1-7	Where 2 is default
Remark	
T2 must be longer than T1.	
Example	
AT+CMUX=0,0,5,127,10,3,30,10,2	
OK	
AT+CMUX?	
+CMUX: 0,0,5,127,10,3,30,10,2	
OK	

## 2.18 AT+ICF DTE DCE Character Framing

AT+ICF	
Syntax	
<b>Test Command</b> AT+ICF=?	<b>Possible Returns:</b> +ICF: (list of supported <format> values),(list of supported <parity> values) OK
<b>Read Command</b> AT+ICF?	<b>Possible returns:</b> +ICF: <format>,<parity> OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+ICF=[<format>[,<parity>]]	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This extended-format compound parameter is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use while accepting DTE commands and while transmitting information text and result code, if this is not automatically determined.	
Parameter Description	
<b>&lt;format&gt;</b> Determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.	
1	8 data, 2 stops
2	8 data, 1 parity, 1 stop
3	8 data, 1 stop
<b>&lt;parity&gt;</b> Determines how the parity bit is generated and checked, if present (when format is 2 or 5).	
0	Odd
1	Even
Remark	
<ul style="list-style-type: none"> <li>Character framing auto detect is not supported.</li> <li>For hardware limitation, 8910 8915 only support +ICF:(1-3),(0-1).</li> </ul>	
Example	
<b>AT+ICF=3</b> OK <b>AT+ICF=3</b> +ICF: 3, 0 OK	

## 2.19 AT+IPR Set Fixed Local Rate

AT+IPR	
Syntax	
<b>Test Command</b> AT+IPR=?	<b>Possible Returns:</b> +IPR: (list of supported auto detectable <rate> values)[,(list of fixed-only <rate> values)] OK
<b>Read Command</b> AT+IPR?	<b>Possible Returns:</b> +IPR: <rate> OK
<b>Set Command</b> AT+IPR=<rate>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s.	
Parameter Description	
<rate>	
auto detectable <rate>	2400,4800,9600,14400,19200,28800,33600,38400,57600,115200
fixed-only <rate>	230400,460800,921600
Remark	
The <rate> value specified shall be the rate in bits per second at which the DTE-DCE interface should operate, e.g. "19200" or "115200". The rates supported by a particular DCE are manufacturer-specific; however, the IPR parameter should permit the setting of any rate supported by the DCE during online operation. Rates which include a non-integral number of bits per second should be truncated to the next lower integer (e.g. 134.5 bit/s should be specified as 134; 45.45 bit/s should be specified as 45). If unspecified or set to 0, automatic detection is selected for the range determined by the DCE manufacturer.	
Example	
<b>AT+IPR=9600</b> OK	

## 2.20 AT+GSN Request TA Serial Number Identification | IMEI Number

AT+GSN	
Syntax	
<b>Test Command</b> AT+GSN=?	<b>Possible Returns:</b> +GSN: (0,1) OK
<b>Set Command</b> AT+GSN=0	<b>Possible Returns:</b> <sn> OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+GSN=1	<b>Possible returns:</b> <imei> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command request TA serial number identification   IMEI number.	
Parameter Description	
<b>&lt;sn&gt;</b>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
<b>&lt;imei&gt;</b>	
International mobile equipment identity.	
Example	
<b>AT+GSN=0</b> 012345678901234 OK	



## 2.21 AT+GMM Request TA Model Identification

AT+GMM	
Syntax	
<b>Test Command</b> AT+GMM=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+GMM	<b>Possible Returns:</b> <model> OK
Command Description	
This command request TA model identification (may equal to +CGMM).	
Parameter Description	
<model>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
Example	
<b>AT+GMM</b> 8910DM_MDL OK	

## 2.22 AT+CGMM Request Model Identification

AT+CGMM	
Syntax	
<b>Test Command</b> AT+CGMM=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CGMM	<b>Possible Returns:</b> <model> OK
Command Description	
<p>This command causes the TA to return one or more lines of information text &lt;model&gt;, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.</p>	
Parameter Description	
<b>&lt;model&gt;</b>	
<p>The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.</p>	
Example	
<b>AT+CGMM</b> 8910DM_MDL OK	

## 2.23 AT+GMR Request Revision Identification

AT+GMR	
Syntax	
<b>Test Command</b> AT+GMR=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+GMR	<b>Possible Returns:</b> <revision> OK
Command Description	
This command request TA revision identification (may equal to +CGMR).	
Parameter Description	
<revision>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
Example	
<b>AT+GMR</b> ML302-PBRH0S00 OK	

## 2.24 AT+CGMR Request Revision Identification

AT+CGMR	
Syntax	
<b>Test Command</b> AT+CGMR=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CGMR	<b>Possible Returns:</b> <revision> OK
Command Description	
This command request TA revision identification.	
Parameter Description	
<revision>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
Example	
<b>AT+CGMR</b> ML302-PBRH0S00 OK	

## 2.25 AT+GMI Request TA Manufacturer Identification

AT+GMI	
Syntax	
<b>Test Command</b> AT+GMI=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+GMI	<b>Possible Returns:</b> <manufacturer> OK
Command Description	
Request TA manufacturer identification (may equal to +CGMI).	
Parameter Description	
<manufacturer>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
Remark	
<ul style="list-style-type: none"> <li>– The user defined profile will be restored automatically after power-up. Use ATZ to restore user profile and AT&amp;F to restore factory settings. Until the first use of AT&amp;W, ATZ works as AT&amp;F.</li> <li>– A list of parameters stored to the user profile can be found in Section chapter 29, appendix B, AT Command Settings storable with AT&amp;W.</li> </ul>	
Example	
<b>AT+GMI</b> CMCC OK	

## 2.26 AT+CGMI Request Manufacturer Identification

AT+CGMI	
Syntax	
<b>Test Command</b> AT+CGMI=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CGMI	<b>Possible Returns:</b> <manufacturer> OK
Command Description	
Request TA manufacturer identification.	
Parameter Description	
<manufacturer>	
The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.	
Remark	
<ul style="list-style-type: none"> <li>– The user defined profile will be restored automatically after power-up. Use ATZ to restore user profile and AT&amp;F to restore factory settings. Until the first use of AT&amp;W, ATZ works as AT&amp;F.</li> <li>– A list of parameters stored to the user profile can be found in Section chapter 29, appendix B, AT Command Settings storable with AT&amp;W.</li> </ul>	
Example	
<b>AT+CGMI</b> CMCC OK	

## 2.27 ATI Request Manufacturer Specific Information About The TA

ATI	
Syntax	
<b>Execute Command</b> ATI	<b>Possible Returns:</b> <manufacturer> <module name> <module version> OK
Command Description	
Request manufacturer specific information about the TA (software cannot use this command to determine the capabilities of a TA)	
Parameter Description	
<b>&lt;value&gt;</b>	
May optionally be used to select from among multiple types of identifying information, specified by the manufacturer. 0 return manufacturer identification, model identification and revision identification of software. (1-255) Reserved for manufacturer proprietary use.	
Example	
ATI CMCC 8910DM_MDL ML302-PBRH0S00 OK	

## 2.28 AT+CIMI Request International Mobile Subscriber Identity

AT+CIMI	
Syntax	
<b>Test Command</b> AT+CIMI=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CIMI	<b>Possible Returns:</b> <IMSI> OK
Command Description	
This command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual active application in the UICC (GSM or USIM) or SIM card which is attached to MT.	
Parameter Description	
<IMSI>	
International Mobile Subscriber Identity (string without double quotes).	
Example	
<b>AT+CIMI</b> 460001033113523 OK	



## 2.29 AT+CALA Set an Alarm Time

AT+CALA	
Syntax	
<b>Test Command</b> AT+CALA=?	<b>Possible Returns:</b> +CALA: (list of supported <n>s), (list of supported <type>s), <tlength>,<rlength>, (list of supported <silent>s) OK
<b>Read Command</b> AT+CALA?	<b>Possible returns:</b> +CALA: <time>,<n1>,<type>,<[<text>]>,<[<recurr>]>,<silent> +CALA: <time>,<n2>,<type>,<[<text>]>,<[<recurr>]>,<silent> [...] OK
<b>Set Command</b> AT+CALA=<time>[,<n>[,<type>[,<text>[,<recurr>[,<silent>]]]]]	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command is used to set/list alarms or date/time in the ME.	
Parameter Description	
<b>&lt;time&gt;</b>	
String type value, the format is "yy/mm/dd,hh:mm:ss+zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -12. . . +13). E.g. 6th of May 2005, 22:10:00 GMT+2 hours equal to "05/05/06,22:10:00+08" Note: if <time> equals current date and time or is set to an earlier date, returns +CME ERROR: 21.	
<b>&lt;n&gt;,&lt;n1&gt;,&lt;n2&gt;</b>	
Integer type value Indicating the index of the alarm. Default is 1, in the range of 1~15.	
<b>&lt;type&gt;</b>	
Integer type value indicating the type of the alarm (e.g. sound, volume, LED); values and default is 0.	
<b>&lt;text&gt;</b>	
String type value indicating the text to be displayed when alarm time is reached; maximum length <tlength>.	
<b>&lt;tlength&gt;</b>	
Integer type value indicating the maximum length of <text>.	
<b>&lt;recurr&gt;</b>	
String type value indicating day of week for the alarm in one of the following formats: "<1..7>[,<1..7>[. . .]]" - Sets a recurrent alarm for one or more days in the week. The digits 1 to 7 corresponds to the days in the week, Monday (1), Sunday (7). Example: The string "1,2,3,4,5" may be used to set an alarm for all weekdays. "0" - Sets a recurrent alarm for all days in the week.	
<b>&lt;rlength&gt;</b>	
Integer type value indicating the maximum length of <recurr>.	

**AT+CALA****Parameter Description****<silent>**

Integer type value indicating if the alarm is silent or not. If set to 1 the alarm will be silent and the only result from the alarm is the unsolicited result code +CALV. If set to 0 the alarm will not be silent.

**Remark**

- If you want set a recycle alarm, just import the time
- If don't input recur, it will consider it not a recyclable alarm
- If don't input index, the alarm index is 1 will be substitute
- String format of alarm: "yy/MM/dd,hh:mm:ss".
- Maximum number of alarms is 15. Seconds are not taken into account.

**Example**

**AT+CALA="20/11/26,10:20:34",1,0,"alarm1"** //Set alarm for Dec 26th, 2007 at 10:20:34 am, the alarm name is alarm1.

OK //The alarm is stored.

**AT+CALA?**

+CALA: "18:02:10",2,0,"alarm2","2",0

+CALA: "20/11/26,10:20:34",1,0,"alarm1",0

OK

**AT+CALA=?**

+CALA: (1-16),(0),(32),(15),(0,1)

OK

## 2.30 AT+CALD Delete One Alarm

AT+CALD	
Syntax	
<b>Test Command</b> AT+CALD=?	<b>Possible Returns:</b> +CALD: (list of supported <n>s) OK
<b>Set Command</b> AT+CALD=<n>	<b>Possible returns:</b> OK
Command Description	
Action command deletes an alarm in the MT.	
Parameter Description	
<n>	
Integer type value Indicating the index of the alarm. Default is manufacturer specific.	
Example	
<b>AT+CALD=1</b> OK	



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## 2.31 AT+CCLK Real Time Clock

AT+CCLK	
Syntax	
<b>Test Command</b> AT+CCLK=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CCLK?	<b>Possible returns:</b> +CCLK: <time> OK
<b>Set Command</b> AT+CCLK=<time>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command stores the currently set parameters to a user defined profile in the non-volatile memory.	
Parameter Description	
<b>&lt;time&gt;</b> String type value, the format is "yy/mm/dd,hh:mm:ss+zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96. . . +96). E.g. 6th of May 2005, 22:10:00 GMT+2 hours equals to "05/05/06,22:10:00+08"	
<b>Note:</b> If <time> equals current date and time or is set to an earlier date, returns +CME ERROR: 21.	
Remark	
If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?. The format of <time> is specified by use of the +CSDF command. The range of the year is from 1970 to 2069.	
Example	
<b>AT+CCLK="07/10/25,11:33:40+08"</b> OK <b>AT+CCLK?</b> +CCLK: "07/10/25,11:33:44+08" OK	

## 2.32 AT+CLAC Lists All Available at Commands

AT+CLAC	
Syntax	
<b>Test Command</b> AT+CLAC=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CLAC	<b>Possible returns:</b> <AT Command1> [<AT Command2> [...]] OK
Command Description	
Execution command causes the MT to return one or more lines of AT Commands.	
Parameter Description	
<AT Command>	
Defines the AT command including the prefix AT. Text shall not contain the sequence 0<CR> or OK<CR>.	



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## 2.33 AT+CTZR Time Zone Report

AT+CTZR	
Syntax	
<b>Test Command</b> AT+CTZR=?	<b>Possible Returns:</b> +CTZR: (list of supported <reporting>s) OK
<b>Read Command</b> AT+CTZR?	<b>Possible returns:</b> +CTZR:<reporting> OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+CTZR=[<reporting>]	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
<p>This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: &lt;tz&gt;, +CTZE: &lt;tz&gt;,&lt;dst&gt;,[&lt;time&gt;], or +CTZEU: &lt;tz&gt;,&lt;dst&gt;,[&lt;utime&gt;] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. If setting fails in an MT error, +CME ERROR: &lt;err&gt; is returned. Read command returns the current reporting settings in the MT. Test command returns supported &lt;reporting&gt;-values as a compound value.</p>	
Parameter Description	
<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>].
<tz>	
<p>String type value representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "zz", expressed as a fixed width, two-digit integer with the range -48 . . . +56. To maintain a fixed width, numbers in the range -9 . . . +9 are expressed with a leading zero, e.g. "-09", "+00" and "+09".</p>	
<dst> Integer type value indicating whether <tz> includes daylight savings adjustment.	
0	<tz> includes no adjustment for Daylight Saving Time.
1	<tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time.
2	<tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time.

AT+CTZR	
Parameter Description	
<time>	String type value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The local time can be derived by the MT from information provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and local time reporting if the universal time is provided by the network.
<utime>	String type value representing the universal time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The universal time can be provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and universal time reporting if provided by the network.



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## 2.34 AT+CBC Battery Charging/Discharging and Charge Control

AT+CBC	
Syntax	
<b>Test Command</b> AT+CBC=?	<b>Possible Returns:</b> +CBC: (list of supported <bcs>s),(list of supported <bcl>s) OK
<b>Execute Command</b> AT+CBC	<b>Possible returns:</b> +CBC: <bcs>,<bcl> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
Execution command returns battery connection status <bcs> and battery charge level <bcl> of the ME. Test command returns values supported by the TA as compound values. When device has no real power source, the execution command will get default value.	
Parameter Description	
<b>&lt;bcs&gt;</b>	
0	No charging adapter is connected.
1	Charging adapter is connected. <b>(not supported now)</b>
2	Charging adapter is connected, charging in progress.
3	Charging adapter is connected, charging has finished.
4	Charging error, charging is interrupted. <b>(not supported now)</b>
5	False charging temperature, charging is interrupted while temperature is beyond allowed range. <b>(not supported now)</b>
<b>&lt;bcl&gt;</b>	
Battery capacity 0-100 percent of remaining capacity (11 steps) 0 indicates that either the battery is exhausted or the capacity value is not available.	
Example	
<b>AT+CBC=?</b> +CBC: (0-5),(0-100) OK <b>AT+CBC</b> +CBC: 2, 55 OK	



## 2.35 AT+CEER Extended Error Report

AT+CEER	
Syntax	
<b>Test Command</b> AT+CEER=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CEER	<b>Possible Returns:</b> +CEER: <report> OK  <b>With MT Related Errors:</b> +CME ERROR: <err>
Command Description	
<p>This command causes the TA to return one or more lines of information text &lt;report&gt;, determined by the MT manufacturer, which should offer the user of the TA an extended report of the reason for - the failure in the last unsuccessful call setup (originating or answering) or in call modification; - the last call release; - the last unsuccessful GPRS attach or unsuccessful PDP context activation; - the last GPRS detach or PDP context deactivation. Typically, the text will consist of a single line containing the cause information given by GSM/UMTS network in textual format.</p>	
Parameter Description	
<b>&lt;report&gt;</b>	
<p>The total number of characters, including line terminators, in the information text shall not exceed 2041 characters. Text shall not contain the sequence 0&lt;CR&gt; or OK&lt;CR&gt;.</p>	
Example	
<b>AT+CEER=?</b> OK ATD13501275915; OK BUSY <b>AT+CEER</b> +CEER: CALL RELEASED, NETWORK SENT UDUB TO ME OK	

## 2.36 AT+CPAS Phone Activity Status

AT+CPAS	
Syntax	
<b>Test Command</b> AT+CPAS=?	<b>Possible Returns:</b> +CPAS: (list of supported <pas>s) OK
<b>Execute Command</b> AT+CPAS	<b>Possible Returns:</b> +CPAS: <pas> OK  <b>With MT Related Errors:</b> +CME ERROR: <err>
Command Description	
This command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone. Refer subclass 9.2 for possible <err> values.	
Parameter Description	
<pas>	
0	Ready (MT allows commands from TA/TE).
1	Unavailable (MT does not allow commands from TA/TE).
2	Unknown (MT is not guaranteed to respond to instructions).
3	Ringing (MT is ready for commands from TA/TE, but the ringer is active).
4	Call in progress (MT is ready for commands from TA/TE, but a call is in progress).
5	Asleep (MT is unable to process commands from TA/TE because it is in a low functionality state) also all other values below 128 are reserved by the present document.
Example	
<b>AT+CPAS=?</b> +CPAS: (0,1,3,4) OK <b>AT+CPAS</b> +CPAS: 0 OK	

## 2.37 AT+CSCLK Set Low Clock Mode

AT+CSCLK	
Syntax	
<b>Test Command</b> AT+CSCLK=?	<b>Possible Returns:</b> +CSCLK: (list of supported <n>s) OK
<b>Read Command</b> AT+CSCLK?	<b>Possible Returns:</b> +CSCLK: <n> OK  <b>With MT Related Errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+CSCLK=<n>	<b>Possible Returns:</b> OK  <b>With MT Related Errors:</b> +CME ERROR: <err>
Command Description	
This command is used to set low clock mode.	
Parameter Description	
<n>	
0	Disable slow clock.
1	Enable slow clock mode, use DTR to control slow clock, when DTR is set high, enable slow clock, otherwise disable slow clock.
2	Set slow clock mode automaticly, disable slow clock when uart recieve or send data, otherwise enable slow clock.
Example	
<b>AT+CSCLK=1</b> OK	

## 2.38 AT+IFC DTE-DCE Local Flow Control

AT+IFC	
Syntax	
<b>Test Command</b> AT+IFC=?	<b>Possible Returns:</b> +ICF: (list of supported <rxfc> values),(list of supported <txfc> values) OK
<b>Read Command</b> AT+IFC?	<b>Possible Returns:</b> +IFC: <rxfc>,<txfc> OK  <b>With MT related errors:</b> +CME ERROR: <err>
<b>Set Command</b> AT+IFC=<rxfc>,<txfc>	<b>Possible returns:</b> OK  <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This comomand is used to control DTE_DCE local flow.	
Parameter Description	
<rxfc>	
0	Disable rx flow control.
2	Enable rx flow control.
<txfc>	
0	Disable tx flow control.
2	Enable tx flow control.
Example	
<b>AT+IFC?</b> +IFC: 0,0 OK	

## 2.39 AT+TRB (Optional) Restart

AT+TRB	
Syntax	
<b>Execute Command</b> AT+TRB	<b>Possible Returns:</b> REBOOTING
Command Description	
Execution command restart the module.	

## 2.40 AT+UPTIME Get Update Time of System in Milliseconds

AT+UPTIME	
Syntax	
<b>Execute Command</b> AT+UPTIME	<b>Possible Returns:</b> +UPTIME:<milliseconds> OK
Command Description	
Get update time of system in milliseconds.	

## 2.41 AT+CGBV Baseband Version

AT+CGBV	
Syntax	
<b>Test Command</b> AT+CGBV=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+ CGBV	<b>Possible returns:</b> +CGBV: RDA<Version> OK
Command Description	
Get baseband version.	

## 2.42 AT+EGMR Read and Write IMEI

AT+EGMR	
Syntax	
<b>Test Command</b> AT+EGMR=?	<b>Possible Returns:</b> +EGMR: (1, 2), (7) OK
<b>Set Command</b> AT+EGMR=<mode>,<format> [,<data>]	<b>Possible returns:</b> OK <b>or</b> <data> OK <b>With MT related errors:</b> +CME ERROR: <err>
Command Description	
This command read IMEI from factory partition, also can write IMEI to factory patition.	
Parameter Description	
<b>&lt;mode&gt;</b>	
1	Write mode
2	Read mode
<b>&lt;format&gt;</b>	
7 only can set this value, to match ap.	
<b>&lt;data&gt;</b>	
IMEI number	
Example	
<b>AT+EGMR=1,7,"11111111111111"</b> OK <b>AT+EGMR=2,7</b> 1111111111 OK	

# 3 SIM Commands

## 3.1 AT+SIM SIM Status Checking

AT+SIM	
Syntax	
<b>Test Command</b> AT+SIM=?	<b>Possible Returns:</b> +SIM: (0-n)
<b>Set Command</b> AT+SIM=<slot id>	<b>Possible Returns:</b> +<type>:<status> OK
Command Description	
Set command to check and return the type and status of SIM specify by user.	
Parameter Description	
<n>	
Integer type; maximum slot identification.	
<slot id>	
Integer type; slot identification.	
<type>	
String type; it should be "SIM" or "USIM" according to the SIM type.	
<status>	
ABSENT	There is no SIM card in the slot.
NORMAL	The SIM in the slot is normal SIM card.
TEST	The SIM in the slot is test SIM card.
ABNORMAL	The SIM in the slot is abnormal SIM card.
Example	
<b>AT+SIM=?</b> +SIM: (0-1) OK <b>AT+SIM=0</b> +USIM: NORMAL OK <b>AT+SIM=0</b> +SIM: ABSENT OK	

## 3.2 AT+SIMIF Request SIM Type

AT+SIMIF	
Syntax	
<b>Test Command</b> AT+SIMIF=?	<b>Possible Returns:</b> ^SIMIF: <1>,<0,1>
<b>Read Command</b> AT+SIMIF?	<b>Possible Returns:</b> ^SIMIF: 1,<value>
<b>Set Command</b> AT+SIMIF=1,<mode>	<b>Possible Returns:</b> ^SIMIF: <type> OK
Command Description	
Execution command return the type of SIM.	
Parameter Description	
<b>&lt;value&gt;</b>	
0	SIM
1	UICC
<b>&lt;mode&gt;</b>	
0	Value mode
1	Text mode
<b>&lt;type&gt;</b>	
If mode == 0, SIM card return 0, USIM card return 1. if mode == 1, SIM card return "SIM", USIM card return "UICC".	
Example	
<b>AT+SIM=?</b> +SIM: (0-1) OK <b>AT+SIMIF=?</b> ^SIMIF: (1),(0,1) OK <b>AT+SIMIF?</b> ^SIMIF:1,0 OK <b>AT+SIMIF=1,1</b> ^SIMIF: SIM OK	



### 3.3 AT+CCID Request ICC Identification

AT+CCID	
Syntax	
<b>Execute Command</b> AT+CCID	<b>Possible Returns:</b> +CCID: <ccid> OK
Command Description	
Execution command causes the TA to return <ICCID> in the SIM card.	
Parameter Description	
<ccid>	
String type; the ccid read from SIM card.	
Example	
<b>AT+CCID</b> +CCID: 898602D431AB83610972 OK	



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### 3.4 AT+CPIN Pin Authentication

AT+CPIN	
Syntax	
<b>Test Command</b> AT+CPIN=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CPIN?	<b>Possible Returns:</b> +CPIN: <code>
<b>Set Command</b> AT+CPIN=<pin>[, <newpin>]	<b>Possible Returns:</b> OK
Command Description	
Set command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH SIM PIN, etc.).	
Parameter Description	
<b>&lt;pin&gt;</b>	
String type values	
<b>&lt;newpin&gt;</b>	
String type values, new pin after <pin> check pass	
<b>&lt;code&gt;</b>	
Values reserved by the present document:	
<ul style="list-style-type: none"> <li>– READY MT is not pending for any password;</li> <li>– SIM PIN MT is waiting UICC/SIM PIN to be given;</li> <li>– SIM PUK MT is waiting UICC/SIM PUK to be given;</li> <li>– SIM PIN2 MT is waiting active application in the UICC (GSM or USIM) or SIM card PIN2 to be given (this &lt;code&gt; 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);</li> <li>– SIM PUK2 MT is waiting active application in the UICC (GSM or USIM) or SIM card PUK2 to be given (this &lt;code&gt; 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).</li> </ul>	
Remark	
Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH SIM are: +CGMI, +CGMM, +CGMR, D112; (emergency call), +CPAS, +CFUN, +CPIN, +CDIS (read and test command only), and +CIND (read and test command only). Notes: After input three times wrong PIN, SIM card will be locked!	
Example	
<b>AT+CPIN="1234"</b> OK <b>AT+CPIN?</b> +CPIN:READY	

### 3.5 AT^CPINC Total Times of Access the Sim Card

AT^CPINC	
Syntax	
<b>Test Command</b> AT^CPINC=?	<b>Possible Returns:</b> ^CPINC: PIN1&PIN2: (1-3),PUK1&PUK2: (1-10)
<b>Execute Command</b> AT^CPINC	<b>Possible Returns:</b> ^CPINC: <rest time> OK
Command Description	
Remaining times of access the sim card.	
Example	
<b>AT^CPINC</b> ^CPINC: 3,10,3,10 OK	



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## 3.6 AT+CPIN2 Pin2 Authentication

AT+CPIN2	
Syntax	
<b>Test Command</b> AT+CPIN2=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CPIN2?	<b>Possible Returns:</b> +CPIN2: <code>
<b>Set Command</b> AT+CPIN2=<pin>[,<newpin>]	<b>Possible Returns:</b> OK
Command Description	
+CPIN2 controls network authentication of the MT.	
Parameter Description	
<b>&lt;pin&gt;</b>	
Password (string type), usually SIM PIN2 or, if requested, SIM PUK2.	
<b>&lt;newpin&gt;</b>	
If the requested code was SIM PUK2: new password (PIN2).	
<b>&lt;code&gt;</b>	
Values reserved by the present document:	
<ul style="list-style-type: none"> <li>– READY MT is not pending for any password;</li> <li>– SIM PIN MT is waiting UICC/SIM PIN to be given;</li> <li>– SIM PUK MT is waiting UICC/SIM PUK to be given;</li> <li>– SIM PIN2 MT is waiting active application in the UICC (GSM or USIM) or SIM card PIN2 to be given (this &lt;code&gt; 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);</li> <li>– SIM PUK2 MT is waiting active application in the UICC (GSM or USIM) or SIM card PUK2 to be given (this &lt;code&gt; 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).</li> </ul>	
Example	
<b>AT+CPIN2="2345"</b> OK <b>AT+CPIN2?</b> +CPIN:READY	

### 3.7 AT+CLCK Facility Lock

AT+CLCK	
Syntax	
<b>Test Command</b> AT+CLCK=?	<b>Possible Returns:</b> +CLCK: (list of supported <fac>s)
<b>Set Command</b> AT+CLCK=<fac>,<mode> [,<passwd>[,<class>]]	<b>Possible Returns:</b> +CLCK:<status>[,<class1>[<CR><LF>+CLCK:<status>,<class2>[...]]] OK
Command Description	
This command be used to lock or unlock some functions of the list that be supported by this ME.	
Parameter Description	
<fac> String type; values reserved by the present document.	
SC	SIM
AO	BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 [6] clause 1) *
OI	BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 [6] clause 1) *
OX	BOIC exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 [6] clause 1) *
FD	SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature
<mode> Integer type	
0	Unlock
1	Lock
2	Query status
<status> Integer type	
0	Not active
1	Active
<passwd>	
String type; shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD.	
<classx> Integer type Meaning: is a sum of integers each representing a class of information (default 7):	
1	Voice (telephony)
2	Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
4	Fax (facsimile services)
8	Short message service
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

**AT+CLCK****Example****AT+CLCK="SC",1,"1234"**

OK

**AT+CLCK="SC",2**

+CLCK: 1

OK

&lt;Restart system&gt;

**AT+CPIN?**

+CPIN: READY

OK

**AT+CPIN="1234"**

OK

**AT+CLCK="SC",0,"1234"**

OK

&lt;Restart system&gt;

**AT+CPIN?**

+CPIN: READY

OK



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## 3.8 AT+CPWD Change Password

AT+CPWD	
Syntax	
<b>Test Command</b> AT+CPWD=?	<b>Possible Returns:</b> +CPWD: list of supported (<fac>,<pwdlength>)
<b>Set Command</b> AT+CPWD=<fac>,<oldpwd>,<newpwd>	<b>Possible Returns:</b> OK
Command Description	
This command is used to change password [pin/pin2].	
Parameter Description	
<fac> String type; values reserved by the present document.	
SC	SIM
P2	SIM PIN2 refer Facility Lock +CLCK for other values
<status> Integer type	
0	Not active
1	Active
<oldpwd>,<newpwd>	
String type; <oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>	
<pwdlength>	
Integer type; maximum length of the password for the facility	
Example	
<b>AT+CPWD=?</b> +CPWD: ("SC,8"),("P2",8) OK	

### 3.9 AT+QSPN Request Service Provider Name

AT+QSPN	
Syntax	
<b>Test Command</b> AT+QSPN=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+QSPN?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+QSPN	<b>Possible Returns:</b> +QSPN:<display mode>,<spn> OK
Command Description	
Execution command return Service Provider Name.	
Parameter Description	
<display mode>	
0	Doesn't display PLMN
1	Display PLMN
<spn>	
String type; Service Provider Name.	
Example	
<b>AT+QSPN</b> +QSPN:0,CMCC OK <b>AT+QSPN?</b> OK	



## 3.10 AT+QGID Request SIM GID

AT+QGID	
Syntax	
<b>Test Command</b> AT+QGID=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+QGID?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+QGID	<b>Possible Returns:</b> +QGID:<gid1>,<gid2> OK
Command Description	
Execution command return SIM GID.	
Parameter Description	
<gid1>,<gid2>	
Group Identifier	
Example	
<b>AT+QGID</b> +QGID:FFFFFFFF,FFFFFFFF OK <b>AT+QGID?</b> OK	

## 3.11 AT+CRSM Restricted SIM Access

AT+CRSM	
Syntax	
<b>Test Command</b> AT+CRSM=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CRSM?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+CRSM=<command>[,<fileid> [,<P1>,<P2>,<P3>[,<data>]]]	<b>Possible Returns:</b> +CRSM:<sw1>,<sw2>[,<response>] OK
Command Description	
This command supports limited access to SIM database.	
Parameter Description	
<b>&lt;command&gt;</b> Following commands are used for SIM card.	
<b>176</b>	READ BINARY
<b>178</b>	READ RECORD
<b>192</b>	GET RESPONSE
<b>214</b>	UPDATE BINARY
<b>220</b>	UPDATE RECORD
<b>242</b>	STATUS
<b>Note:</b> Commands above plus one is used for USIM card, e.g. read a record of USIM, the command is 179. All other values are reserved	
<b>&lt;field&gt;</b> For SIM card, it is integer type, e.g. read ADN fileid is 28474 (6F3A in hex). for USIM card, it is string type, e.g. read ADN fileid is 5F3A4F3A (5F3A is the path, 4F3A is the file id). this is the identifier of an elementary datafile on SIM. Mandatory for every command except STATUS	
<b>&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;</b> Integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 11.11 [28]	
<b>&lt;data&gt;</b> Information which shall be written to the SIM (hexadecimal character format; refer +CSCS)	
<b>&lt;SW1&gt;,&lt;SW2&gt;</b> Integer type; 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	
<b>&lt;response&gt;</b> Response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer GSM 11.11 [28]). 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.	

**AT+CRSM****Example**

**AT+CRSM=220,20282,2,4,28,"57687775652048777575576877756520487775755768777565204877","7F105F3A"**

+CRSM: 144,0

OK

**AT+CRSM=179,20282,2,4,28,"","7F105F3A"**

+CRSM: 144,0,"57687775652048777575576877756520487775755768777565204877"

OK



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## 3.12 AT+CRSML Read Records of EF Files on (U)SIM

AT+CRSML	
Syntax	
<b>Test Command</b> AT+CRSML=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+CRSML=<fileid>, <start record>,<count>	<b>Possible Returns:</b> +CRSML:<record1\n> ... +CRSML:<recordn\n> OK
Command Description	
This command read some records of certain files on (U)SIM.	
Parameter Description	
<b>&lt;fileid&gt;</b>	
Integer type; This is the identifier of an elementary datafile on SIM.	
<b>&lt;start record&gt;</b>	
Integer type; First record read from.	
<b>&lt;count&gt;</b>	
Integer type; The number of records read from (U)SIM.	
<b>&lt;record1\n&gt;,&lt;record2\n&gt;...&lt;recordn\n&gt;</b>	
String type; record data from (U)SIM.	
Example	
<b>AT+CRSML=1597656890,1,2</b> +CRSML:144,1,FF +CRSML:144,2,FF OK	

### 3.13 AT+CNUM Subscriber Number

AT+CNUM	
Syntax	
<b>Test Command</b> AT+CNUM=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CNUM	<b>Possible Returns:</b> +CNUM:[<alpha1>],<number1>,<type1>[<CR><LF>]
Command Description	
This command read some records of certain files on (U)SIM.	
Parameter Description	
<b>&lt;alpha&gt;</b>	
Optional alphanumeric string associated with numberx used character set should be the one selected with command Select TE Character Set +CSCS.	
<b>&lt;number&gt;</b>	
String type phone number of formats specified by <typex>.	
<b>&lt;typex&gt;</b>	
Type of address octet in integer format.	
<b>&lt;text&gt;</b>	
Field of maximum length <tlength>; character set as specified by command +CSCS. The display of text depending to the storage format in the sim card. If we store the pbk entry with ucs2 format, we show Chinese string here, otherwise, we show NON-Chinese string. We do not care about charsets; it is decided by command +CSCS setting when we store them.	
Example	
<b>AT+CNUM</b>	
OK	

# 4 Call Control Commands

## 4.1 ATA Answer a Call

ATA	
Syntax	
<b>Execute Command</b> ATA	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> ERROR NO CARRIER
Command Description	
This command is used to answer an incoming call.	
Remark	
This command should be used only when there is one call. When there are several calls, please use the AT+CHLD to answer a new call.	
Example	
<b>RING&lt;incoming call&gt;</b> ATA CONNECT	

## 4.2 ATD Make A Call

ATD	
Syntax	
<b>Execute Command</b> ATD<number>	<b>Possible Returns:</b> <b>If success:</b> <b>When the call is in progress:</b> OK and NO ANSWER or NO CARRIER <b>Connection be released:</b> NO DAILTONE or BUSY <b>If failed:</b> ERROR
Command Description	
This command is used to make an outgoing call. The length of dial number is less than 20.	
Parameter Description	
<b>&lt;Number&gt;</b>	
Dialing digits, include 1,2,3,4,5,6,7,8,9,0,*,#,+,A,B,C,. . .	
Example	
<b>ATD10086</b> OK CONNECT	

## 4.3 ATH Disconnect Existing Call

ATH	
Syntax	
<b>Execute Command</b> ATH	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> ERROR
Command Description	
Hang up all existing connected calls, including active, waiting and hold calls.	
Remark	
When the link is established or ringing, the command will get OK. But for the establishing, the command will get error.	
Example	
<b>ATH</b> OK	



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## 4.4 AT+CHUP Hang up All Existing Connected Calls

AT+CHUP	
Syntax	
<b>Test Command</b> AT+CHUP=?	<b>Possible Returns:</b> <b>If success:</b> OK
<b>Execute Command</b> AT+CHUP	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> ERROR
Command Description	
Hang up all existing connected calls, including active, waiting and hold calls.	
Remark	
This command implements the same behavior as ATH.	
Example	
<b>AT+CHUP</b> OK	

## 4.5 AT+CHLD Call Hold and Multiparty

AT+CHLD	
Syntax	
<b>Test Command</b> AT+CHLD=?	<b>Possible Returns:</b> +CHLD: (0,1,1X,2,2X,3) OK
<b>Set Command</b> AT+CHLD=<n>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> ERROR
Command Description	
Hang up all existing connected calls, including active, waiting and hold calls.	
Parameter Description	
<n>	
0	Releases all held calls or sets User Determined User Busy (UDUB) for a waiting call.
1	Releases all active calls (if any exist) and accepts the other (held or waiting) call [waiting call is the first].
1X	Releases a specific call X it can be in active, hold or waiting state.
2	Places all active calls (if any exist) on hold and accepts the other (held or waiting) call.
2X	Places all active calls on hold except call X with which communication shall be supported.
3	Adds a held call to the conversation
Remark	
The multiparty call has the MAX connection is 5, at the same time, the phone can also have a waiting call.	

## 4.6 AT+CLCC List Current Calls Of ME

AT+CLCC	
Syntax	
<b>Test Command</b> AT+CLCC=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CLCC	<b>Possible Returns:</b> <b>If success:</b> [+CLCC: <id1>, <dir>, <stat>, <mode>,<mpty>[,<number>,<type>][<CR><LF>+CLCC:<id2>,<dir>, <stat>, <mode>, <mpty>[,<number>,<type>]. . . ] OK <b>If failed:</b> +CME ERROR: <err>
Command Description	
List all calls of ME.	
Parameter Description	
<b>&lt;idx&gt;</b>	
Integer type; call identification number as described in 3GPP TS 22.030 [19] sub clause 4.5.5.1; this number can be used in +CHLD command operations	
<b>&lt;dir&gt;</b>	
0	Mobile originated (MO) call
1	Mobile terminated (MT) call
<b>&lt;stat&gt; State of the call</b>	
0	Active
1	Held
2	Dialing (MO call)
3	Alerting (MO call)
4	Incoming (MT call)
5	Waiting (MT call)
7	Release (network release this call)
<b>&lt;mode&gt; Bearer/teleservice</b>	
0	Voice
1	Data
2	Fax
3	Voice followed by data, voice mode
4	Alternating voice/data, voice mode
5	Alternating voice/fax, voice mode
6	Voice followed by data, data mode
7	Alternating voice/data, data mode
8	Alternating voice/fax, fax mode
9	Unknown

**AT+CLCC****Parameter Description****<mpty>**

<b>0</b>	Call is not one of multiparty (conference) call parties
<b>1</b>	Call is one of multiparty (conference) call parties

**<number>**

String type phone number in format specified by &lt;type&gt;.

**<type>**

Type of address octet in integer format (refer GSM 04.08 [8] sub clause 10.5.4.7).

**Example****ATD10086**

OK

+CIEV: "SOUNDER",1

CONNECT

**AT+CLCC**

+CLCC: 1,0,0,0,0,"10086",129

OK

**ATH**

+CIEV: "CALL",0

+CIEV: "SOUNDER",1

OK

**AT+CLCC**

OK

# 5 Network Service Commands

## 5.1 AT+COPN Read Operator Names

AT+COPN	
Syntax	
<b>Test Command</b> AT+COPN=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+COPN	<b>Possible Returns:</b> +COPN: <numeric1>,<alpha1> +COPN: <numeric2>,<alpha2> [. . . ] OK ERROR +CME ERROR:<err>
Command Description	
Execute command returns the list of operator names from the MT. Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.	
Reference	
3GPP TS 27.007 V3.12.0	
Parameter Description	
<b>&lt;numeric&gt;</b>	
String type; operator in numeric format (see +COPS).	
<b>&lt;alphan&gt;</b>	
String type; operator in long alphanumeric format (see +COPS).	
Unsolicited Result Codes	
URC1 +CALA: <text> URC2 +SYSSTART ALARM MODE+CALA: <text>	
Remark	
Execute command returns the list of operator names from the MT. Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.	

**AT+COPN****Example****AT+COPN**

... ..

+COPN: "46004","ChinaMobile"

... ..

OK



中国移动  
China Mobile

## 5.2 AT+COPS Operator Selects

AT+COPS	
Syntax	
<b>Test Command</b> AT+COPS=?	<b>Possible Returns:</b> +COPS: [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric<oper>,numeric <oper>[,<AcT>]]s] [,(list of supported <mode>s),(list of supported <format>s)] +CME ERROR: <err>
<b>Read Command</b> AT+COPS?	<b>Possible Returns:</b> +COPS: <mode>[,<format>,<oper>[,<AcT>]] +CME ERROR: <err>
<b>Set Command</b> AT+COPS=mode[,<format>[,<oper>[,<AcT>]]]	<b>Possible Returns:</b> +CME ERROR: <err>
Command Description	
This command be used to select the vender.	
Reference	
3GPP TS 27.007 V3.12.0	
Parameter Description	
<b>&lt;mode&gt;</b>	
0	Automatic (<oper> field is ignored)
1	Manual (<oper> field shall be present)
2	Deregister from network
3	Set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> field is ignored); this value is not applicable in read command response.
4	Manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered.
<b>&lt;format&gt;</b>	
0	Long format alphanumeric <oper>
1	Short format alphanumeric <oper>
2	Numeric <oper>
<b>&lt;oper&gt;</b>	
String type; <format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer GSM 04.08 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 2)(network code digit 1).	

AT+COPS	
Parameter Description	
<stat>	
0	Unknown
1	Available
2	Current
3	Forbidden
<AcT>	
0	GSM
1	GSM Compact
2	UTRAN
3	GSM w/EGPRS
4	UTRAN w/HSDPA
5	UTRAN w/HSUPA
6	UTRAN w/HSDPA and HSUPA
7	E-UTRAN
8	EC-GSM-IoT(A/Gb mode)
9	E-UTRAN(NB-S1 mode)
Unsolicited Result Codes	
URC1	
+CALA: <text>	
URC2	
+SYSSTART ALARM MODE+CALA: <text>	
Remark	
<p>Set command forces an attempt to select and register the GSM/UMTS network &lt;oper&gt;. Mode is used to decide the register should be automatic or manual. If the selected mode is manual or manual first, the network should return with a list from which user can select one to register on.</p> <p>Read command returns the current mode and the currently selected operator. If no operator is selected, &lt;format&gt;, &lt;oper&gt; and &lt;AcT&gt; are omitted.</p> <p>Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator &lt;stat&gt;, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM/UICC, and other networks.</p>	



**AT+COPS****Example****AT+COPS=?**

+COPS:

(1,"China Mobile","CMCC","46000",7),(1,"ChinaTelecom","CT","46011",7),(0-4),(0,2)

OK

**AT+COPS?**

+COPS:0

//Register network failed

OK

**AT+COPS=3,0 <Set oper format>**

OK

**AT+COPS?**

+COPS: 0,0," CMCC ",9

OK

**AT+COPS=3,2**

OK

**AT+COPS?**

+COPS: 0,0,46000,9

OK



## 5.3 AT+CREG Network Registration

AT+CREG	
Syntax	
<b>Test Command</b> AT+CREG=?	<b>Possible Returns:</b> +CREG: (list of supported <n>s)
<b>Read Command</b> AT+CREG?	<b>Possible Returns:</b> +CREG: <n>,<stat>[,<lac>,<ci>,<act>] +CME ERROR: <err>
<b>Set Command</b> AT+CREG=<n>	<b>Possible Returns:</b> OK
Command Description	
This command be used to query the register status.	
Reference	
3GPP TS 27.007 V3.12.0	
Parameter Description	
<b>&lt;n&gt;</b>	
0	Disable network registration unsolicited result code
1	Enable network registration unsolicited result code +CREG: <stat>
2	Enable network registration and location information unsolicited result code +CREG:<stat>[,<lac>,<ci>]
<b>&lt;stat&gt;</b>	
0	Not registered, MT is not currently searching a new operator to register to
1	Registered, home network
2	Bot registered, but MT is currently searching a new operator to register to
3	Registration denied
4	Unknown
5	Registered, roaming
<b>&lt;lac&gt;</b>	
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" equals 195 in decimal).	
<b>&lt;ci&gt;</b>	
String type; two-byte cell ID in hexadecimal format	

AT+CREG	
Parameter Description	
<act> Integer type; access technology of serving cell	
0	GSM
1	GSM Compact
2	UTRAN
3	GSM w/GPRS
4	UTRAN w/HSDPA
5	UTRAN w/HSUPA
6	UTRAN w/HSDPA and HSUPA
7	E-UTRAN
8	EC-GSM-IoT (A/Gb mode)
9	E-UTRAN (NB-S1 mode)
Unsolicited Result Codes	
URC1 +CALA: <text>	
URC2 +SYSSTART ALARM MODE+CALA: <text>	
Example	
<b>AT+CREG=1</b> OK <reference URC: +CREG> <Note ...> 1: Enable URC +CREG:<stat> to report status change of network registration	
<b>AT+CREG?</b> +CREG:0,1 OK <reference URC: +CREG> <Note ...> Query the register status of the local and network	

## 5.4 AT+CPOL Preferred Operator List

AT+CPOL	
Syntax	
<b>Test Command</b> AT+CPOL=?	<b>Possible Returns:</b> +CPOL: (list of supported <index>s),(list of supported <format>s) +CME ERROR: <err>
<b>Read Command</b> AT+CPOL?	<b>Possible Returns:</b> +CPOL: <index1>,<format>,<oper1> [<CR><LF> +CPOL:<index2>,<format>,<oper2>[. . .]] +CME ERROR: <err>
<b>Set Command</b> AT+CPOL=[<index>] [, <format>[, <oper>]]	<b>Possible Returns:</b> OK ERROR
Command Description	
<p>This command is used to edit the user preferred list of networks in the active application on the UICC(GSM or USIM) or preferred list of networks in the SIM card.</p> <p>Execute command writes an entry in the SIM list of preferred operators (EFPLMNsel), when the SIM card is present or when the UICC is present with an active GSM application. When UICC is present with an active USIM application, execute commands writes an entry in the User controlled PLMN selector with Access Technology list (EFPLMNwAcT), only the PLMN field could be entered, the Access Technologies for each PLMN in this list is not accesible with this command (Note: new command for accessing the Access Technologies for each PLMN in this list is FFS). If &lt;index&gt; is given but &lt;oper&gt; is left out, entry is deleted. If &lt;oper&gt; is given but &lt;index&gt; is left out, &lt;oper&gt; is put in the next free location. If only &lt;format&gt; is given, the format of the &lt;oper&gt; in the read command is changed.</p> <p>Note: when adding preferred operater, &lt;format&gt; can only be 2.</p> <p>Read command returns all used entries from the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card list of preferred operators.</p> <p>Note: if &lt;format&gt; is 0, but there is no relevant long format alphanumeric &lt;oper&gt;, the numeric &lt;oper&gt; will be returned.</p> <p>Test command returns the whole index range supported by the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card</p>	
Reference	
3GPP TS 27.007 V3.12.0	
Parameter Description	
<b>&lt;index&gt;</b>	
Integer type; the order number of operators in the active application in the UICC (GSM or USIM) user preferred list of networks or SIM card preferred operator list	
<b>&lt;format&gt;</b>	
<b>0</b>	Long format alphanumeric <oper>
<b>1</b>	Short format alphanumeric <oper>
<b>2</b>	Numeric <oper>

AT+CPOL	
Parameter	Description
<b>&lt;oper&gt;</b>	
String type	
<b>&lt;format&gt;</b>	
Indicates if the format is alphanumeric or numeric (see +COPS)	
Unsolicited Result Codes	
URC1	
+CALA: <text>	
URC2	
+SYSSTART ALARM MODE	
+CALA: <text>	
Example	
<b>AT+CPOL=?</b>	
+CPOL: (1-82),(0,1,2)	
OK	
<b>AT+CPOL?</b>	
+CPOL: 1,2,"46000"	
OK	
<b>AT+CPOL=2,2,"46001"</b>	
OK	
<Note : ..>Add a preferred operator	
<b>AT+CPOL?</b>	
+CPOL: 1,2,"46001"	
+CPOL: 2,2,"46001"	
+CPOL: 3,2,"46000"	
+CPOL: 5,2,"46011"	
+CPOL: 8,2,"46011"	
+CPOL: 81,2,"46011"	
+CPOL: 82,2,"46000"	
OK	
<b>AT+CPOL=,0</b>	
OK	
<Note : ..>Set the display format as long format alphanumeric <oper>	
<b>AT+CPOL?</b>	
+CPOL: 1,0,"ChinaUnicom"	
+CPOL: 2,0,"ChinaUnicom"	
+CPOL: 3,0,"ChinaMobile"	
+CPOL: 5,0,"ChinaTelecom"	
+CPOL: 8,0,"ChinaTelecom"	
+CPOL: 81,0,"ChinaTelecom"	
+CPOL: 82,0,"ChinaMobile"	
OK	

**AT+CPOL****Example (Continued)****AT+CPOL=1****AT+CPOL?**

+CPOL: 2,2,"46001"

+CPOL: 3,2,"46000"

+CPOL: 5,2,"46011"

+CPOL: 8,2,"46011"

+CPOL: 81,2,"46011"

+CPOL: 82,2,"46000"

OK

&lt;Note : ..&gt;Delete the preferred operator with index of 1

+CPOL: 2,0,"China Unicom"



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China Mobile

## 5.5 AT+CTEC Set User Preferred Rat

AT+CTEC	
Syntax	
<b>Set Command</b> AT+CTEC=<nCurrentRat>, <nPreferRat>	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
<b>Read Command</b> AT+CTEC?	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
Set user preferred rat (don't support in NB-IoT project).	
Parameter Description	
<nCurrentRat> The current rat value.	
0	Auto
2	GSM Only
4	LTE Only
<nPreferRat> The preferred rat value.	
0	Auto
2	GSM Only
4	LTE Only
Example	
<b>AT+CTEC=0,2</b> OK <b>AT+CTEC?</b> +CTEC: 2,2 OK	

## 5.6 AT+CSQ Signal Quality

AT+ CSQ	
Syntax	
<b>Test Command</b> AT+CSQ=?	<b>Possible Returns:</b> +CSQ: (list of supported <rsi>s),(list of supported <ber>s)
<b>Execute Command</b> AT+CSQ	<b>Possible Returns:</b> +CSQ: <rsi>,<ber> +CME ERROR: <err>
Command Description	
This command be used to query the quality of the signal.	
Parameter Description	
<rsi>	
0	113 dBm or less
1	111 dBm
2 . . . 30	109 . . . 53 dBm
31	51 dBm or greater
99	Not known or not detectable
<ber> (in percent)	
0 . . . 7	As RXQUAL values in the table in GSM 05.08 [20] sub clause 8.2.4
99	Not known or not detectable
Unsolicited Result Codes	
URC1 +CALA: <text> URC2 +SYSSTART ALARM MODE +CALA: <text>	
Example	
<b>AT+CSQ</b> +CSQ: 13, 99 OK <Note ...> <b>AT+CSQ=?</b> +CSQ: (0-31,99),(0-7,99)	



## 5.7 AT+CTZU Automatic Update System Time via Nitz

AT+ CTZU	
Syntax	
<b>Test Command</b> AT+CTZU=?	<b>Possible Returns:</b> +CTZU(<mode>) OK
<b>Read Command</b> AT+CTZU?	<b>Possible Returns:</b> +CTZU <mode> OK
<b>Execute Command</b> AT+CTZU=<enable>	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned. Read command returns the current settings in the MT. Test command returns supported on- and off-values as a compound value.	
Parameter Description	
<mode>	
0	NITZ not update system time
1	NITZ update local time to system
2	NITZ update GMT time to system
Example	
<b>AT+CTZU=?</b> +CTZU:(0, 1, 2) OK <b>AT+CTZU?</b> +CTZU:0 OK <b>AT+CTZU=0</b> OK	

## 5.8 AT+CCED Cell Environment Description

AT+CCED	
Syntax	
<b>Test Command</b> AT+CCED=?	<b>Possible Returns:</b> +CCED: (0),(1,2,8) OK
<b>Set Command</b> AT+CCED=<mode>, <requested dump>	<b>Possible Returns:</b> OK
Command Description	
This command can be used by the application to retrieve the cell parameters of the main cell and of up to six neighbour cells. Two ways may exist for the external application to know these cell parameters: on request of the application, or automatically by the module every 5 seconds. The automatic mode is not supported during communication or registration.	
Parameter Description	
<mode> Integer type	
0	Stop automatic shots
1	Automatic shots requested
<requested dump> Integer type	
1	Main Cell: MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev, RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS
2	Neighbour1 to Neighbour6: MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev
8	Main cell RSSI indications (Rxlev)from 0 to 31.
Remark	
When attach the LTE, the below informations will return after sending the set command	
LTE rat Main Cell	plmn,imsi,roamingFlag,bandInfo,bandwidth,dLEarfcn,pcid,rsrp,rsrq
GSM rat Neighbour Cell	arfcn,bsic,rxlev
LTE rat Neighbour Cell	frequency,pcid,rsrp,rsrq

## 5.9 AT+CESQ Extended Signal Quality

AT+ CESQ	
Syntax	
<b>Test Command</b> AT+CESQ=?	<b>Possible Returns:</b> +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)
<b>Execute Command</b> AT+CESQ	<b>Possible Returns:</b> +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> +CME ERROR: <err>
Command Description	
Execution command returns received signal quality parameters. If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> is set to 255. If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255. If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.	
Parameter Description	
<b>&lt;rxlev&gt;</b> Integer type; received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).	
0	rssI < -110 dBm
1	-110 dBm <= rssI < -109 dBm
2	-109 dBm <= rssI < -108 dBm
....	
v61	-50 dBm <= rssI < -49 dBm
62	-49 dBm <= rssI < -48 dBm
63	-48 dBm <= rssI
99	Not known or not detectable
<b>&lt;ber&gt;</b> 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
<b>&lt;rscp&gt;</b> 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 < -120 dBm
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

AT+ CESQ	
Parameter Description	
<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	$E_c/I_o < -24 \text{ dB}$
1	$-24 \text{ dB} \leq E_c/I_o < -23.5 \text{ dB}$
2	$-23.5 \text{ dB} \leq E_c/I_o < -23 \text{ dB}$
....	
47	$-1 \text{ dB} \leq E_c/I_o < -0.5 \text{ dB}$
48	$-0.5 \text{ dB} \leq E_c/I_o < 0 \text{ dB}$
49	$0 \text{ dB} \leq E_c/I_o$
255	Not known or not detectable
<rsrp> Integer type; reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7). $0 \text{ rsrq} < -19.5 \text{ dB}$	
1	$-19.5 \text{ dB} \leq \text{rsrq} < -19 \text{ dB}$
2	$-19 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$
....	
32	$-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$
33	$-3.5 \text{ dB} \leq \text{rsrq} < -3 \text{ dB}$
34	$-3 \text{ dB} \leq \text{rsrq}$
255	Not known or not detectable

## 5.10 AT+TUEINFO Query UE status

AT+TUEINFO	
Syntax	
Execute Command AT+TUEINFO	<b>Possible Returns:</b>
	TUEINFO:DLEARFCN,<dIEarfcn> TUEINFO:PCID,<pcid> TUEINFO:RSRP,<rsrp> TUEINFO:RSRQ,<rsrq> TUEINFO:SINR,<sinr> TUEINFO:ULMCS,<ulMcs> TUEINFO:DLMCS,<dIMcs> TUEINFO:MPDCCHREPNUM,<mpdcchRepNum> TUEINFO:PUSCHREPNUM,<puschRepNum> TUEINFO:PDSCHREPNUM,<pdschRepNum> TUEINFO:RESERVED,<reserved> TUEINFO:ULRBNUM,<ulRbNum> TUEINFO:DLRBNUM,<dIRbNum> OK
Command Description	
Execution command query UE status info.	

# 6 EPS Commands

## 6.1 AT+CEMODE UE Modes of Operation for EPS

AT+CEMODE	
Syntax	
<b>Test Command</b> AT+CEMODE=?	<b>Possible Returns:</b> +CEMODE(list of supported <mode>s)) OK
<b>Read Command</b> AT+CEMODE?	<b>Possible Returns:</b> +CEMODE<mode> OK
<b>Set Command</b> AT+CEMODE=[<mode>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command is used to set the MT to operate according to the specified mode of operation for EPS (Evolved Packet System). If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.</p> <p>The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology.</p> <p>The test command is used for requesting information on the supported MT modes of operation as a compound value.</p>	
Parameter Description	
<b>&lt;mode&gt;</b> Integer type; indicates the mode of operation. The default value is manufacturer specific.	
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
Example	
<b>AT+CEMODE?</b> +CEMODE:0 OK <b>AT+CEMODE=?</b> +CEMODE:(0,1,2,3) OK <b>AT+CEMODE=0</b> OK	

## 6.2 AT+CGEQOS Define EPS Quality of Service

AT+CGEQOS	
Syntax	
<b>Test Command</b> AT+CGEQOS=?	<b>Possible Returns:</b> +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)   OK
<b>Read Command</b> AT+CGEQOS?	<b>Possible Returns:</b> [+CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>]] [<CR> <LF> +CGEQOS: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>][...]] OK
<b>Set Command</b> AT+CGEQOS=[<cid>[,<QCI>[,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR>]]]]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command allows the TE to specify the EPS Quality of Service parameters &lt;cid&gt;, &lt;QCI&gt;, [&lt;DL_GBR&gt; and &lt;UL_GBR&gt;] and [&lt;DL_MBR&gt; and &lt;UL_MBR&gt;] for a PDP context or Traffic Flows (see 3GPP TS 24.301 [83] and 3GPP TS 23.203 [85]). When in UMTS/GPRS the MT applies a mapping function to UMTS/GPRS Quality of Service.</p> <p>A special form of the set command, +CGEQOS= &lt;cid&gt; causes the values for context number &lt;cid&gt; to become undefined. The read command returns the current settings for each defined QoS.</p> <p>The test command returns the ranges of the supported parameters as compound values.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;QCI&gt;</b> Integer type; specifies a class of EPS QoS (see 3GPP TS 23.203 [85] and 3GPP TS 24.301 [83]).	
<b>0</b>	QCI is selected by network
<b>1-4</b>	Value range for guaranteed bit rate Traffic Flows 75 value for guaranteed bit rate Traffic Flows.
<b>5-9</b>	Value range for non-guaranteed bit rate Traffic Flows 79 value for non-guaranteed bit rate Traffic Flows.
<b>128-254</b>	Value range for Operator-specific QCIs.
<b>65, 66, 67, 69, 70</b>	The QCI values 65, 66, 67, 69 and 70 are not allowed to be requested by the UE. If the TE requests a QCI parameter 65, 66, 67, 69 or 70, the MT responds with result code +CME ERROR: 181 (unsupported QCI value).

AT+CGEQOS	
Parameter	Description
<DL_GBR>	Integer type; indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_GBR>	Integer type; indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<DL_MBR>	Integer type; indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_MBR>	Integer type; 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]).
Example	
<b>AT+CGEQOS?</b> CGEQOS:2,3 <b>AT+CGEQOS=?</b> +CGEQOS: (1..7),(0..9), , , , OK <b>AT+CGEQOS=2,3</b> OK	



## 6.3 AT+CGEQOSRDP EPS Quality of Service Read Dynamic Parameters

AT+CGEQOSRDP	
Syntax	
<b>Test Command</b> AT+CGEQOSRDP=?	<b>Possible Returns:</b> +CGEQOSRDP: (list of <cid>s associated with active contexts) OK
<b>Set Command</b> AT+CGEQOSRDP[=<cid>]	<b>Possible Returns:</b> [+CGEQOSRDP: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>][,<DL_AMBR>, <UL_AMBR>]]<CR><LF>+CGEQOSRDP: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>][,<DL_AMBR>, <UL_AMBR>][...] OK
Command Description	
<p>The execution command returns the Quality of Service parameters &lt;QCI&gt;, [&lt;DL_GBR&gt; and &lt;UL_GBR&gt;] and [&lt;DL_MBR&gt; and &lt;UL_MBR&gt;] of the active secondary or non secondary PDP context associated to the provided context identifier &lt;cid&gt;.</p> <p>If the parameter &lt;cid&gt; is omitted, the Quality of Service parameters for all secondary and non secondary active PDP contexts are returned.</p> <p>The test command returns a list of &lt;cid&gt;s associated with secondary or non secondary active PDP contexts. Parameters of both network and MT/TA initiated PDP contexts will be returned.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;QCI&gt;</b> Integer type; specifies a class of EPS QoS (see 3GPP TS 23.203 [85] and 3GPP TS 24.301 [83]).	
<b>0</b>	QCI is selected by network
<b>1-4</b>	Value range for guaranteed bit rate Traffic Flows
<b>65-66</b>	Value range for guaranteed bit rate Traffic Flows
<b>5-9</b>	Value range for non-guaranteed bit rate Traffic Flows
<b>69-70</b>	Value range for non-guaranteed bit rate Traffic Flows
<b>128-254</b>	Value range for Operator-specific QCIs
<b>&lt;DL_GBR&gt;</b>	
Integer type; 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]).	
<b>&lt;UL_GBR&gt;</b>	
Integer type; 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]).	

AT+CGEQOSRDP	
Parameter	Description
<DL_MBR>	Integer type; indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<UL_MBR>	Integer type; indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).
<DL_AMBR>	Integer type; indicates DL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.
<UL_AMBR>	Integer type; indicates UL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.
Example	
<b>AT+CGEQOSRDP=?</b> +CGEQOSRDP: (1..7) OK <b>AT+CGEQOSRDP=1</b> OK	



## 6.4 AT+CEREG EPS Network Registration Status

AT+CEREG	
Syntax	
<b>Test Command</b> AT+CEREG=?	<b>Possible Returns:</b> +CEREG: (list of supported <n>s) OK
<b>Read Command</b> AT+CEREG?	<b>Possible Returns:</b> <b>When &lt;n&gt;=0, 1, 2 or 3, stat=0, 3 or 4, and command successful:</b> +CEREG: <n>,<stat>[,<tac>],[<ci>],[<AcT>,<cause_type>,<reject_cause>]]]  <b>When &lt;n&gt;=0, 1, 2 or 3, stat=1 or 5, and command successful:</b> +CEREG: <n>,<stat>[,<tac>],[<ci>],[<AcT>]]  <b>When &lt;n&gt;=4 or 5 and command successful:</b> +CEREG: <n>,<stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>],[<reject_cause>],[<Active-Time>],[<Periodic-TAU>]]] OK
<b>Set Command</b> AT+CEREG=[<n>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command controls the presentation of an unsolicited result code +CEREG: &lt;stat&gt; when &lt;n&gt;=1 and there is a change in the MT's EPS network registration status in E-UTRAN, or unsolicited result code +CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;]] when &lt;n&gt;=2 and there is a change of the network cell in E-UTRAN. The parameters &lt;AcT&gt;, &lt;tac&gt; and &lt;ci&gt; are provided only if available. The value &lt;n&gt;=3 further extends the unsolicited result code with [&lt;cause_type&gt;,&lt;reject_cause&gt;], when available, when the value of &lt;stat&gt; changes.</p> <p>If the UE wants to apply PSM for reducing its power consumption, see +CPSMS command and 3GPP TS 23.682 [149], the set command controls the presentation of an unsolicited result code+CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;],[&lt;cause_type&gt;],[&lt;reject_cause&gt;],[&lt;Active-Time&gt;],[&lt;Periodic-TAU&gt;]]].</p> <p>When &lt;n&gt;=4 the unsolicited result code will provide the UE with additional information for the Active Time value and the extended periodic TAU value if there is a change of the network cell in E-UTRAN. The value &lt;n&gt;=5 further enhances the unsolicited result code with &lt;cause_type&gt; and &lt;reject_cause&gt; when the value of &lt;stat&gt; changes. The parameters &lt;AcT&gt;, &lt;tac&gt;, &lt;ci&gt;, &lt;cause_type&gt;, &lt;reject_cause&gt;, &lt;Active-Time&gt; and &lt;Periodic-TAU&gt; are provided only if available.</p> <p><b>Note 1:</b> If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.</p> <p>The read command returns the status of result code presentation and an integer &lt;stat&gt; which shows whether the network has currently indicated the registration of the MT. Location information elements &lt;tac&gt;, &lt;ci&gt; and &lt;AcT&gt;, if available, are returned only when &lt;n&gt;=2 and MT is registered in the network. The parameters [&lt;cause_type&gt;,&lt;reject_cause&gt;], if available, are returned when &lt;n&gt;=3.</p> <p>Test command returns values supported as a compound value.</p>	

AT+CEREG	
Parameter Description	
<b>&lt;n&gt;</b> Integer type	
0	Disable network registration unsolicited result code
1	Enable network registration unsolicited result code +CEREG: <stat>
2	Enable network registration and location information unsolicited result code +CEREG:<stat>[,<tac>],[<ci>],[<AcT>]]
3	Enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]]
4	For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>][,<Active-Time>],[<Periodic-TAU>]]]]
5	For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>],[<reject_cause>][,<Active-Time>],[<Periodic-TAU>]]]]
<b>&lt;stat&gt;</b> Integer type; indicates the 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 (e.g. out of E-UTRAN coverage)
5	Registered, roaming
6	Registered for "SMS only", home network (not applicable)
7	Registered for "SMS only", roaming (not applicable)
8	Attached for emergency bearer services only (See Note 2)
9	Registered for "CSFB not preferred", home network (not applicable)
10	Registered for "CSFB not preferred", roaming (not applicable)
<b>Note 2:</b> 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.	
<b>&lt;tac&gt;</b>	
String type; two-byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).	
<b>&lt;ci&gt;</b>	
String type; four-byte E-UTRAN cell ID in hexadecimal format.	

AT+CEREG	
Parameter Description	
<b>&lt;AcT&gt;</b> Integer type; indicates the access technology of the serving cell	
0	GSM (not applicable)
1	GSM Compact (not applicable)
2	UTRAN (not applicable)
3	GSM w/EGPRS (see NOTE 3) (not applicable)
4	UTRAN w/HSDPA (see NOTE 4) (not applicable)
5	UTRAN w/HSUPA (see NOTE 4) (not applicable)
6	UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable)
7	E-UTRAN
<b>Note 3:</b> 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.	
<b>Note 4:</b> 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.	
<b>&lt;cause_type&gt;</b> Integer type; indicates the type of <reject_cause>	
0	Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] AnnexA.
1	Indicates that <reject_cause> contains a manufacturer-specific cause.
<b>&lt;reject_cause&gt;</b>	
Integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.	
<b>&lt;Active-Time&gt;</b>	
String type; one byte in an 8-bit format.	
Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].	
<b>&lt;Periodic-TAU&gt;</b>	
String type; one byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].	
Example	
<b>AT+CEREG?</b> +CEREG:1,1,"114e","097c7474",9 OK <b>AT+CEREG=?</b> +CEREG:(0-5) OK <b>AT+CEREG=1</b> OK	

## 6.5 AT+CSCON Signalling Connection Status

AT+CSCON	
Syntax	
<b>Test Command</b> AT+CSCON=?	<b>Possible Returns:</b> +CSCON: (list of supported <n>s) OK
<b>Read Command</b> AT+CSCON?	<b>Possible Returns:</b> +CSCON: <n>,<mode>[,<state>] CME ERROR: <err>
<b>Set Command</b> AT+CSCON=[<n>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command controls the presentation of an unsolicited result code +CSCON. If &lt;n&gt;=1, +CSCON: &lt;mode&gt; is sent from the MT when the connection mode of the MT is changed. If &lt;n&gt;=2 and there is a state within the current mode, +CSCON: &lt;mode&gt;[,&lt;state&gt;] is sent from the MT. If &lt;n&gt;=3, +CSCON: &lt;mode&gt;[,&lt;state&gt;[,&lt;access&gt;]] is sent from the MT. If setting fails, an MT error, +CME ERROR: &lt;err&gt; is returned.</p> <p>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.</p> <p>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.</p> <p>The &lt;state&gt; value indicates the state of the MT when the MT is in GERAN, UTRAN connected mode or E-UTRAN.</p> <p>The read command returns the status of result code presentation and an integer &lt;mode&gt; which shows whether the MT is currently in idle mode or connected mode. State information &lt;state&gt; is returned only when &lt;n&gt;=2. Radio access type information &lt;access&gt; is returned only when &lt;n&gt;=3.</p> <p>Test command returns supported values as a compound value.</p>	
Parameter Description	
<n> Integer type	
0	Disable unsolicited result code
1	Enable unsolicited result code +CSCON: <mode>
2	Enable unsolicited result code +CSCON: <mode>[,<state>]
3	Enable unsolicited result code +CSCON: <mode>[,<state>[,<access>]]
<mode> Integer type; indicates the signalling connection status	
0	Idle
1	Connected

AT+CSCON	
Parameter Description	
<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	
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
<access> Integer type; indicates the current radio access type	
0	Indicates usage of radio access of type GERAN, see 3GPP TS 45.001 [146].
1	Indicates usage of radio access of type UTRAN TDD, see 3GPP TS 25.212 [144].
2	Indicates usage of radio access of type UTRAN FDD, see 3GPP TS 25.212 [144].
3	Indicates usage of radio access of type E-UTRAN TDD, see 3GPP TS 36.300 [145].
4	Indicates usage of radio access of type E-UTRAN FDD, see 3GPP TS 36.300 [145].
Example	
<b>AT+CSCON?</b> +CSCON:1,0 OK <b>AT+CSCON=?</b> +CSCON: (0-3) OK <b>AT+CSCON=1</b> OK	

## 6.6 AT+CISRVCC IMS Single Radio Voice Call Continuity

AT+CISRVCC	
Syntax	
<b>Test Command</b> AT+CISRVCC=?	<b>Possible Returns:</b> +CISRVCC:(list of supported <uesrvcc>s) OK
<b>Read Command</b> AT+CISRVCC?	<b>Possible Returns:</b> +CISRVCC: <uesrvcc>
<b>Set Command</b> AT+CISRVCC=[<uesrvcc>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>SRVCC provides the ability to have a seamless handover of a voice call between the PS domain and the CS domain for calls that are anchored in IMS, when the UE is capable of transmitting/receiving on only one of those access networks (PS or CS) at a given time, see 3GPP TS 23.221 [90] subclause 7.2a, annex A.1 and annex A.2.</p> <p>Set command informs MT about the SRVCC Support. MT normally updates the network when changing this parameter. Read command returns the status of the MT stored SRVCC Support.</p> <p>Test command returns supported values as a compound value.</p>	
Parameter Description	
<uesrvcc> Integer type. SRVCC support status.	
0	The UE does not have SRVCC support
1	The UE has SRVCC support
Example	
<b>AT+CISRVCC=?</b> +CISRVCC: 0,1 OK <b>AT+CISRVCC?</b> +CISRVCC: 0,1 OK <b>AT+CISRVCC=1</b> OK	



## 6.7 AT+CEUS UE's Usage Setting for EPS

AT+CEUS	
Syntax	
<b>Test Command</b> AT+CEUS=?	<b>Possible Returns:</b> +CEUS: (list of supported <setting>s) OK
<b>Read Command</b> AT+CEUS?	<b>Possible Returns:</b> +CEUS: <setting>
<b>Set Command</b> AT+CEUS=[<setting>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command is used to set the MT to operate according to the specified UE's usage setting for EPS, see 3GPP TS 24.301 [83].</p> <p>The read command returns the usage setting set by the TE.</p> <p>The test command is used for requesting information on the supported MT setting(s) as a compound value.</p>	
Parameter Description	
<setting> Integer type; indicates the usage setting of the UE. The default value is manufacturer specific.	
0	Voice centric
1	Data centric
Example	
<b>AT+CEUS=?</b> +CEUS: (0,1) OK <b>AT+CEUS?</b> +CEUS: 1 OK <b>AT+CEUS=1</b> OK	

## 6.8 AT+CEVDP UE's Voice Domain Preference E-UTRAN

AT+CEVDP	
Syntax	
<b>Test Command</b> AT+CEVDP=?	<b>Possible Returns:</b> +CEVDP:(list of supported <setting>s) OK
<b>Read Command</b> AT+CEVDP?	<b>Possible Returns:</b> +CEVDP: <setting>
<b>Set Command</b> AT+CEVDP=[<setting>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>The set command is used to set the MT to operate according to the specified voice domain preference for E-UTRAN.</p> <p>The read command returns the setting, independent of the current serving cell capability and independent of the current serving cell's access technology.</p> <p>The test command returns supported values as a compound value.</p>	
Parameter Description	
<b>&lt;setting&gt;</b> Integer type; indicates the voice domain preference of the UE. The default value is manufacturer specific.	
1	CS Voice only
2	CS Voice preferred, IMS PS Voice as secondary
3	IMS PS Voice preferred, CS Voice as secondary
4	IMS PS Voice only
Example	
<b>AT+CEVDP =?</b> +CEVDP: 1..4 OK <b>AT+CEVDP?</b> +CEVDP: 1..4 OK <b>AT+CEVDP=1</b> OK	

## 6.9 AT+CDU Dial URI

AT+CDU	
Syntax	
<b>Set Command</b> AT+CDU= <action>[,<URI>[, <client>[,<mpidx>[,<CLIR_OIR>[, <CUG_pointer>[, <type_of_call>]]]]]]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
<p>Execution command can be used to dial a URI (with &lt;action&gt;=1) for initiating communication using the specified communication client with the specified media profile. With &lt;action&gt;=0 the command can query which clients are supported for the URI types supported.</p> <p>When the command is used to query the supported URI types (i.e. &lt;action&gt;=0), the URI types are provided by +CDUT: &lt;URI_scheme&gt;. When the command is used to dial a URI (i.e. &lt;action&gt;=1) and the dialling succeeds the command is terminated by +CDU: &lt;ccidx&gt; and OK. The parameters &lt;CLIR_OIR&gt; and &lt;CUG_pointer&gt; are used to set the per call basis values of the supplementary services CLIR / OIR and CUG. The unsolicited result code +CDUU: &lt;ccidx&gt;,&lt;code&gt; can be subsequently provided to give further basic information about the call as it progresses. The value of the &lt;ccidx&gt; is kept until the call is released. See command +CMCCS and unsolicited result code +CMCCSI for provision of additional information about the call setup. If "Call control by USIM" see 3GPP TS 31.111 [92] subclause 4.5 is activated by the USIM, it is the responsibility of the communication client to perform any required call control verification according to the procedures defined in 3GPP TS 31.111 [92] subclause 7.3 prior to the execution of the call setup. When call control by USIM is applicable, the communication client shall perform the call control (for example by using the Commands for USIM application toolkit, see clause 12) and act upon the result of the call control as follows:</p> <ul style="list-style-type: none"> <li>– If call control by USIM performs no modifications to the call request, the call setup shall be executed without any changes to the data;</li> <li>– If call control by USIM modifies the call request, the call setup shall be executed using the modified data as provided by the call control;</li> <li>– If call control by USIM modifies the call request to a different service, the appropriate AT command(s) for that service shall be executed; and</li> <li>– If call control by USIM rejects the call request, the call setup shall not be executed. If the attempt to dial does not succeed, the command is terminated by ERROR / CME ERROR or +CDUI: &lt;cause&gt; and OK.</li> </ul> <p>Test command returns values supported as a compound value.</p>	
Parameter Description	
<action> Integer type	
0	Query supported communication clients for the supported URI types. Execution command +CDU=0 returns a line of intermediate result code +CDUT: <URI_scheme>[,<client>] for every supported <URI_scheme>.
1	Dial <URI> using the indicated communication client with the indicated media profile.
<URI>	
String type; URI including the prefix specifying the URI type. The URI may include URI parameters. The used character set should be the one selected with Select TE Character Set +CSCS.	

AT+CDU	
Parameter Description	
<b>&lt;CLIR_OIR&gt;</b> Integer type. Indicates per call basis changes provided to the supplementary service CLIR / OIR. See +CLIR for further information of the related parameters	
0	No per call-based changes to CLIR / OIR, the settings with +CLIR apply.
1	Restrict the CLI presentation for the current call (CLIR / OIR invocation)
2	Allow CLI presentation for the current call (CLIR / OIR suppression)
<b>&lt;CUG_pointer&gt;</b> Integer type. Indicates per call basis changes provided to the supplementary service closed user group. See +CECUG for further information of the related parameters	
0	No per call basis changes to CUG
1-n	Indicates the CUG index to use for this call. The CUG index and corresponding values used as set with command +CECUG (enable CUG temporary mode). The maximum value of n is implementation specific.
<b>&lt;type_of_call&gt;</b> Integer type. Indicates type of call on per call basis.	
0	Normal call
1	Dual radio voice call continuity call
<b>&lt;URI_scheme&gt;</b>	
String type represented with IRA characters. Parameter identifies supported URI scheme. This parameter shall not be subject to conventional character conversion as per +CSCS. sip Internet Assigned Number Authority (IANA) registry as per RFC 3969 [113], used with Session Initiation Protocol (SIP), see RFC 3261 [111]. tel Internet Assigned Number Authority (IANA) registry as per RFC 5341 [114], used with SIP, see RFC 3966 [112]   urn Internet Assigned Number Authority (IANA) registry according to RFC 2141 [116], only used with SIP in combination with a suitable uniform resource name (URN) namespace.	
<b>&lt;client&gt;</b>	
Integer type. Communication client indication. The default value is implementation specific. 0 MMTel. The UE procedures in 3GPP TS 24.173 [87] apply. 128-255 Reserved for vendor specific communication clients.	
<b>&lt;mpidx&gt;</b>	
Integer type; media profile identification number. The parameter is local to the TE-MT interface. The range of permitted values (minimum value = 1) is returned by the test form of the command +CDEFMP. When +CDU is used for dialling (i.e. with <action>=1) this number can be provided to point to a particular media profile. The provided media profile identification number is the number being returned by +CDEFMP when defining the media profile. Usage and value of a default media profile is implementation specific	
Example	
AT+CDU=1,"tel:+47-123-45678"	
+CDU: 2	
OK	

## 6.10 AT+CHCCS Hangup of Current Calls

AT+CHCCS	
Syntax	
<b>Test Command</b> AT+CHCCS=?	<b>Possible Returns:</b> OK
<b>Test Command</b> AT+CHCCS= <ccidx> [, <cause>]	<b>Possible Returns:</b> OK ERROR +CME ERROR: <err>
Command Description	
<p>Execution command causes the TA to initiate hangup and subsequently perform call clearing of the call for which a &lt;ccidx&gt; was provided when the call was detected in the MT. The parameter &lt;cause&gt; can be added to indicate particular information on the cause for call clearing. Setting the parameter &lt;cause&gt; to values 2 or 3 is typically relevant for call clearing before a call has been established (e.g. an incoming or waiting call). The parameter &lt;cause&gt; is ignored by the lower layers if it is not according to the signaling procedures in question. A special form of the execution command, +CHCCS=0, causes the TA to initiate hangup and subsequently perform call clearing of all calls for which a &lt;ccidx&gt; was provided when the call was detected in the MT. The parameter &lt;cause&gt; will be ignored if &lt;ccidx&gt;=0. The information text +CHCCSI: &lt;ccidx&gt; is provided for each call where a successful hangup is initiated as result of the +CHCCS. If no hangup is initiated, no information text is provided before OK is returned.</p>	
Parameter Description	
<b>&lt;ccidx&gt;</b> Integer type; call identification number as described in 3GPP TS 22.030 [19] subclause 6.5.5.1. This number can be used in +CHLD command operations. Value range is from 1 to N. N, the maximum number of simultaneous call control processes is implementation specific	
<b>&lt;cause&gt;</b> Integer type. Proposed cause value for call clearing	
1	No particular cause indicated
2	Cause "Normal call clearing" (value 16), see 3GPP TS 24.008 [8] table 10.5.123 or BYE request, see RFC 3261 [111] subclause 15.1
3	Cause "Call rejected" (value 21), see 3GPP TS 24.008 [8] table 10.5.123 or "488 Not Acceptable Here", see RFC 3261 [111] subclause 21.4.26
4	Cause "User busy" (value 17), see 3GPP TS 24.008 [8] table 10.5.123 or "486 Busy Here", see RFC 3261 [111] subclause 21.4.24
Example	
<b>AT+CHCCS=?</b> +CHCCS: (0-n) OK <b>AT+CHCCS=2</b> OK	

## 6.11 AT+SETVOLTE Disable/Enable VOLTE

AT+SETVOLTE	
Syntax	
<b>Test Command</b> AT+SETVOLTE=?	<b>Possible Returns:</b> +SETVOLTE: (list of supported <setting>s) OK
<b>Set Command</b> AT+SETVOLTE=[<setting>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
<b>Read Command</b> AT+SETVOLTE?	<b>Possible Returns:</b> "+SETVOLTE:1/0 " OK ERROR +CME ERROR:<err>
Command Description	
Disable/enable VOLTE.	
Parameter Description	
<setting> Integer type	
0	Disable VOLTE
1	Enable VOLTE
Example	
<b>AT+SETVOLTE=?</b> +SETVOLTE: :1 OK <b>AT+SETVOLTE?</b> +SETVOLTE: :0,1 OK <b>AT+SETVOLTE=1</b> OK	

## 6.12 AT+XCAPIP Define the IP Address

AT+XCAPIP	
Syntax	
<b>Read Command</b> AT+XCAPIP?	<b>Possible Returns:</b> +XCAPIP: (list of supported <address>s) OK
<b>Set Command</b> AT+XCAPIP=[cid],[<address>]	<b>Possible Returns:</b> OK ERROR +CME ERROR:<err>
Command Description	
When the SS use the UT mode, define the address.	
Parameter Description	
<cid>	
Integer type; 5 Data PDP cid.	
<address>	
String type; a string parameter which indicates the IP address of the SS operation.	
Example	
<b>AT+XCAPIP?</b> +XCAPIP:5,"192.168.1.1, [00B1:0000:0000:0000:0000:0000:0000:0001]" OK <b>AT+XCAPIP=5,"192.168.1.1,            [00B1:0000:0000:0000:0000:0000:0000:0001]"</b> OK	

# 7 SMS Commands

## 7.1 AT+CSDH Show Text Mode Parameters (for SMS)

AT+CSDH	
Syntax	
<b>Tets Command</b> AT+CSDH=?	<b>Possible Returns:</b> list of supported <show>s OK
<b>Read Command</b> AT+CSDH?	<b>Possible Returns:</b> +CSDH: <show>
<b>Set Command</b> AT+CSDH=[<show>]	<b>Possible Returns:</b> OK
Command Description	
Set command controls whether detailed header information is shown in text mode result codes.	
Parameter Description	
<show>	
0	Do not show the values in result codes.
1	Show the values in result codes.
Example	
AT+CSDH=0 OK	//Not show the message header when list message at the storage, read message in the storage, or indicate to CMTI that new message recieved.
AT+CSDH=1 OK	//Show the message header when list message at the storage, read message in the storage, or indicate to CMTI that new message recieved.



## 7.2 AT+CSMP Set Text Mode Parameters

AT+CSMP	
Syntax	
<b>Test Command</b> AT+CSMP=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CSMP?	<b>Possible Returns:</b> +CSMP: <fo>, <vp>, <pid>, <dc> OK
<b>Set Command</b> AT+CSMP=<fo>[,<vp>[,<pid>[,<dc>]]]	<b>Possible Returns:</b> OK
Command Description	
Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected.	
Parameter Description	
<b>&lt;fo&gt;</b>	
Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER[mt], SMSSUBMIT[mo] (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.	
<b>&lt;vp&gt;</b>	
Depending on SMS-SUBMIT <fo> setting: 3G TS 23.040 [3] TP-Validity-Period either in integer format (default 167), in time-string format (refer to <dt>), or if EVPF is supported, in enhanced format (hexadecimal coded string with double quotes)	
<b>&lt;pid&gt;</b>	
3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)-protocol identity [Different data storage protocol according to which services protocol used]	
<b>&lt;dc&gt;</b>	
Depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format [supported there types of csw allowed, 0, 4, 8]	
Remark	
<ul style="list-style-type: none"> <li>Parameter &lt;fo&gt; &lt;vp&gt; &lt;pid&gt; and &lt;dc&gt;, we recommend to set default value of them, but can use other values if need according to spec definite.</li> <li>If setting "fo" value for MO message, we must make sure the "mti" segment of "fo" (as 03.40 description) is "01", meanings that bit1 is "0" and bit0 is "1", otherwise exception would happen.</li> <li>If setting "dc" value for MO message, we must make sure that the dc is equal to 0, or 4, or 8, other values are not allowed now.</li> </ul>	

**AT+CSMP****Example****AT+CSMP=17,167,0,0**

&lt;in text mode, send message to others or write message to storage with 7bit encode&gt;

OK

**AT+CSMP=17,167,0,4**

&lt;in text mode, send message to others or write message to storage with 8bit encode&gt;

OK

**AT+CSMP=17,167,0,8**

&lt;in text mode, send message to others or write message to storage with 16bit encode, sometimes the Chinese string&gt;

OK



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## 7.3 AT+CMSS Send Message from Storage (for SMS)

AT+CMSS	
Syntax	
<b>Test Command</b> AT+CMSS=?	<b>Possible Returns:</b> OK
<b>Set Comamnd</b> AT+CMSS=<index>[, <da>[, <toda>]]	<b>Possible Returns:</b> <b>If PDU mode(+CMGF=0) and sending successful:</b> +CMSS: <mr>[, <ackpdu>]  <b>If sending fails:</b> +CMS ERROR: <err>
Command Description	
Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).	
Parameter Description	
<b>&lt;index&gt;</b>	
Integer type; value in the range of location numbers supported by the associated memory.	
Remark	
<toda> have three values:161,145,129. At PDU mode, we can't send MT message.	
Example	
<b>AT+CMGF=1</b> OK <b>AT+CSDH=1</b> OK <b>AT+CMGR=1</b> +CMGR: "REC UNREAD","+8617880283362",,"2019/10/31,11:59:08+32",145,17,0,8,"+8613800230500",145,8 testing OK <b>AT+CMSS=1</b> +CMSS: 7 OK <b>AT+CMGF=1</b> OK <b>AT+CSDH=1</b> OK <b>AT+CMGR=1</b> +CMGR: "REC READ","+8617880283362",,"2019/10/31,11:59:08+32",145,17,0,8,"+8613800230500",145,8 testing OK <b>AT+CMSS=1,"13466507607", 129</b> +CMSS: 10 OK	

## 7.4 +CMTI/+CMT Indication New Short Message (for SMS)

+CMTI/+CMT
<b>Possible Response</b>
+CMTI: <mem>,<index>
+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled)
+CMT: <oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data> (Text mode enabled)
<b>Command Description</b>
When receive new short message, send +CMTI or +CMT[+CDS are message report].
<b>Parameter Description</b>
<b>&lt;mem&gt;</b>
String type; memory for storage new messages
<b>&lt;index&gt;</b>
Integer type; value in the range of location numbers supported by the associated memory
<b>&lt;length&gt;</b>
Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
<b>&lt;fo&gt;</b>
Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format
<b>&lt;vp&gt;</b>
Depending on SMS-SUBMIT is supported, in enhanced format (hexadecimal coded string with double quotes)
<b>&lt;pid&gt;</b>
3G TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)
<b>&lt;dcsc&gt;</b>
Depending on the command or result code: 3G TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format
<b>&lt;sca&gt;</b>
3G TS 24.011 [6] RP SC address Address-Value field in string format;
<b>&lt;tosca&gt;</b>
3G TS 24.011 [6] RP SC address Type-of-Address octet in integer format
<b>&lt;scts&gt;</b>
3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
<b>&lt;alpha&gt;</b>
String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character

**+CMTI/+CMT****Remark**

If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached. The read command returns the current Packet Domain service state. The test command is used for requesting information on the supported Packet Domain service states.

**Example**

```

AT+CNMI=0,1,0,0,0
OK
+CIEV: "MESSAGE",1
+CMTI: "SM",16
AT+CMGF=0
OK
AT+CNMI=0,2,0,0,0
OK
+CIEV: "MESSAGE",1
+CMT: ,24
0891683108200305F0040D91687188203863F200089101131175132304541E6CA1
AT+CMGF=1
OK
AT+CSDH=1
OK
AT+CNMI=0,2,0,0,0
OK
+CMT: "+8613021107315",," 2019/10/31,12:00:01+32",145,17,0,8,"+8613010112500",145,8
Testing OK
AT+CMGF=1
OK
AT+CNMI=0,0,0,1,0 (need status report)
OK
AT+CMGS="13445555991"
OK
+CMGS: 12
+CDS: 2,12,"8613021107315",129," 2019/10/31,12:03:59+32"," 2019/10/31,12:03:59+32",0

```

## 7.5 AT+CMGD Delete SMS Message

AT+CMGD	
Syntax	
<b>Test Command</b> AT+CMGD=?	<b>Possible Returns:</b> +CMGD: (list of supported <index>s),(list of supported <delflag>s) OK
<b>Set Command</b> AT+CMGD=<index>[,<delflag>]	<b>Possible Returns:</b> OK
Command Description	
Execution command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for <err> values.	
Parameter Description	
<b>&lt;Index&gt;</b>	
Indicate which message will be deleted.	
<b>&lt;delflag&gt;</b> An integer indicating multiple message deletion request as following.	
<b>0(or omitted)</b>	Delete the message specified in <index>.
<b>1</b>	Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched.
<b>2</b>	Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched.
<b>3</b>	Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.
<b>4</b>	Delete all messages from preferred message storage including unread messages.
Remark	
Test command. List of supported <index>s.	
Example	
<b>AT+CMGD=1</b>	//Delete the specific index message in the storage>.
OK	//If have no message we specific to delete, just return "OK" only.

## 7.6 AT+CMGF Select SMS Message Format

AT+CMGF	
Syntax	
<b>Test Command</b> AT+CMGF=?	<b>Possible Returns:</b> list of supported <mode>s OK
<b>Read Command</b> AT+CMGF?	<b>Possible Returns:</b> +CMGF:<mode>
<b>Set Command</b> AT+CMGF=<mode>	<b>Possible Returns:</b> OK
Command Description	
Set command specifies the input and output format of the short messages. The input and output format of the short messages can be either PDU mode or Text mode.	
Parameter Description	
<mode>	
0	PDU mode (default when implemented)
1	Text mode
Example	
<b>AT+CMGF=0</b> <PDU mode> OK	

## 7.7 AT+CMGL List SMS Messages from Preferred Store

AT+CMGL	
Syntax	
<b>Test Command</b> AT+CMGL=?	<b>Possible Returns:</b> list of supported <stat>s OK
<b>Set Command</b> AT+CMGL=<state>	<b>Possible Returns:</b> OK
Command Description	
Execution command returns messages with status value <stat> from message storage <mem1> to the TE.	
Parameter Description	
<stat> Integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values.	
0	"REC UNREAD" received unread message (i.e. new message)
1	"REC READ" received read message
2	"STO UNSENT" stored unsent message (only applicable to SMS)
3	"STO SENT" stored sent message (only applicable to SMS)
4	"ALL" all messages (only applicable to +CMGL command)
Remark	
<ul style="list-style-type: none"> <li>– &lt;alpha&gt; is not supported now.</li> <li>– If PDU mode, each bit meaning of DCS byte are reference in chapter 11.10.5, CMGW remark.</li> <li>– If have no message we specific to list, just return "OK" only</li> <li>– Don't care about the dcs value with at+csmg setting or charset value with at+cscs setting here, the display is only depending to formats when the message store.</li> </ul>	
Example	
<b>AT+CMGL=n</b> OK	



## 7.8 AT+CMGR Read SMS Message

AT+CMGR	
Syntax	
<b>Test Command</b> AT+CMGR=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+CMGR=<index>	<b>Possible Returns:</b> +CMGR:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>] <data> OK
Command Description	
Execution command returns message with location value <index> from preferred message storage <mem1> to the TE.	
Parameter Description	
<b>&lt;index&gt;</b>	
Indicate which message will be read.	
Remark	
<ul style="list-style-type: none"> <li>– &lt;alpha&gt; and &lt;scts&gt; is not supported now.</li> <li>– Can't read short message report now</li> <li>– When DTE character set is "GSM" (set by +CSCS command), the SMS content will be output by an ASCII string form if it is an pure ASCII SMS, otherwise it will be output in an UCS2 hex string form. If the DET character set is "UCS2" it will always be output in UCS2 hex string form.</li> <li>– if PDU mode, each bit meaning of DCS byte are reference in chapter 11.10.5, CMGW remark.</li> </ul>	
Example	
<b>AT+CMGR=2</b> (the message store in the mem with 8bit encode of dcs) +CMGR: "STO UNSENT","456" testing OK	

## 7.9 AT+CMGS Send SMS Message

AT+CMGS	
Syntax	
<b>Test Command</b> AT+CMGS=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+CMGS= <da>[, <toda>]<CR> text is entered <ctrl-Z/ESC>	<b>Possible Returns:</b> +CMGS:<mr> OK
Command Description	
The write command transmits a short message from TE to network (SMS-SUBMIT). After invoking the write command wait for the prompt ">" and then start to write the message. To send the message simply enter <CTRL-Z>.	
Parameter Description	
<b>&lt;da&gt;</b>	
3G TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <toda>tring type; memory to which writing and sending operations are made	
<b>&lt;toda&gt;</b>	
3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)	
<b>&lt;length&gt;</b>	
Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length) PDU is given: we can send pdu message depending to the dcs value of oct in the pdu header. The PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU.text is entered. we should care about the dcs of at+csmp setting, if we set 7bit encode of dcs, we can send 7bit encode message with text mode. If we set 8bit or 16bit encode of dcs, we can send 8bit or 16bit message with text mode. The entered text should be formatted as follows:	
<ul style="list-style-type: none"> <li>– If &lt;dc&gt; (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7 bit default alphabet is used and &lt;fo&gt; indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set;</li> <li>– If TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules; backspace can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user);</li> <li>– If TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character. (GSM 7 bit default alphabet 23)).</li> </ul>	
<b>&lt;mr&gt;</b>	
Integer type; 3GPP TS 23.040 [3] TP-Message-Reference in integer format	

**AT+CMGS****Remark**

- Not support long short message.
- <todo> have three values: 161,145,129
- At PDU mode, we can't send MT message.

**Example****AT+CMGF=0**

OK

**AT+CMGS=17**

(value of "dcs" is getting from dcs oct in the pdu header)

&gt;0011000B813170862334F20000A70361F118&lt;CTRL Z&gt;

+CMGS: 1

OK

**AT+CMGF=1**

OK

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

(7bit encode of message to store or send in text mode)

OK

**AT+CMGS="13560243602"**

&gt;abc&lt;CTRL-Z&gt;

+CMGS: 5

OK

**AT+CSMP=17,167,0,4**

(8bit encode of message to store or send in text mode)

OK

**AT+CMGS="13560243602",129**

&gt;abc&lt;CTRL-Z&gt;

+CMGS:3

OK

**AT+CSMP=17,167,0,8**

(16bit encode of message to store or send in text mode)

OK

**AT+CMGS="8613560243602",145**

&gt;XXX&lt;CTRL-Z&gt; (Chinese string)

+CMGS:4

OK

## 7.10 AT+CMGC Send Command

AT+CMGC	
Syntax	
<b>Set Command</b> <b>If text mode (+CMGF=1):</b> AT+CMGC=<fo>,<ct>[,<pid> [,<mn>,<da>[,<toda>]]]]<CR>  <b>If pdu mode (+CMGF=0):</b> AT+CMGC=<length><CR> text is entered<ctrl-Z/ESC>	<b>Possible Returns:</b> +CMGC: <mr>[,<scts>] OK
Command Description	
<p>Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of text (3GPP TS 23.040 [3] TP-Command-Data) is done similarly as specified in command Send Message +CMGS, but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets (refer +CMGS). Message reference value &lt;mr&gt; is returned to the TE on successful message delivery. Optionally (when +CSMS &lt;service&gt; value is 1 and network supports) &lt;scts&gt; is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: &lt;err&gt; is returned. See chapter Message Service Failure Result Code for a list of &lt;err&gt; values. This command should be abortable.</p>	
Parameter Description	
<b>&lt;fo&gt;</b>	
Depending on the command or result code: first octet of 3GPP TS 23.040 SMS-DELIVER,SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format	
<b>&lt;ct&gt;</b>	
3GPP TS 23.040 [3] TP-Command-Type in integer format (default 0)	
<b>&lt;pid&gt;</b>	
3GPP TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)	
<b>&lt;mn&gt;</b>	
3GPP TS 23.040 [3] TP-Message-Number in integer format	
<b>&lt;da&gt;</b>	
3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007 [9]); Type of address given by <toda>	
<b>&lt;toda&gt;</b>	
3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)	

**AT+CMGC****Example****AT+CMGF=0**

OK

**AT+CMGC=17**

(value of "dcs" is getting from dcs oct in the pdu header)

&gt;0011000B813170862334F20000A70361F118&lt;CTRL-Z&gt;

+CMGS: 1

OK

**AT+CMGF=1**

OK

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

(7bit encode of message to store or send in text mode)

OK

**AT+CMGC="13560243602"**

&gt;abc&lt;CTRL-Z&gt;

+CMGS: 5

OK

**AT+CSMP=17,167,0,4 (8bit encode of message to store or send in text mode)**

OK

**AT+CMGC="13560243602",129**

&gt;abc&lt;CTRL-Z&gt;

+CMGS:3

OK

**AT+CSMP=17,167,0,8**

(16bit encode of message to store or send in text mode)

OK

**AT+CMGC="+13560243602",145**

&gt;XXX&lt;CTRL-Z&gt; (Chinese string)

+CMGS:4

OK

## 7.11 AT+CMGW Write SMS Message to Memory

AT+CMGW	
Syntax	
<b>Test Command</b> AT+CMGW=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+CMGW[=<oa/da> [,<tooa/toda>[,<stat>]]]<CR> text is entered <CTRL-Z/ESC>	<b>Possible Returns:</b> <b>If writing is successful:</b> +CMGW: <index> OK <b>if writing error:</b> +CME ERROR: <err>
Command Description	
Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned.	
Parameter Description	
<b>&lt;index&gt;</b>	
Integer type; value in the range of location numbers supported by the associated memory.	
<b>&lt;da&gt;</b>	
3G TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <toda>tring type; memory to which writing and sending operations are made.	
<b>&lt;toda&gt;</b>	
3G TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129 or 161).	
<b>&lt;length&gt;</b>	
Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).	
<b>&lt;stat&gt;</b>	
Integer type in PDU mode (default 2 for +CMGW), or string type in text mode (default. STO UNSENT. For +CMGW). Indicates the status of message in memory.	

**AT+CMGW****Remark**

1. Not support long message.

2. If pdu mode, each bit meaning of the dcs byte are following: Dcs byte: bit7..bit0

**bit7..bit4 - encode group**

<b>bit7</b>	Reserved
<b>bit6</b>	Reserved
<b>bit5</b>	<b>0:</b> text uncompress; <b>1:</b> GSM default compress
<b>bit4</b>	<b>0:</b> bit0 and bit1 no use; <b>1:</b> bit0 and bit1 useful

<b>bit0</b>	<b>bit1</b>	
<b>0</b>	<b>0</b>	Class1
<b>0</b>	<b>1</b>	Class2
<b>1</b>	<b>0</b>	Class3
<b>1</b>	<b>1</b>	Class4

<b>bit2</b>	<b>bit3</b>	
<b>0</b>	<b>0</b>	GSM default 7 bit encode
<b>0</b>	<b>1</b>	8 bit encode
<b>1</b>	<b>0</b>	16bit (UCS2) encode
<b>1</b>	<b>1</b>	Reserved

3. At PDU mode, if we want to write MT message at storage, we must specify the status of UNREAD or READ. And at PDU mode, we can't write MT message which have status of UNSENT or SENT

**Example**

**AT+CMGF=0**

OK

**AT+CMGW=17** (value of "dcs" is getting from dcs oct in the pdu header)

>0011000B813170862334F20000A70361F118<CTRL-Z> +CMGW: 1

OK

**AT+CMGF=1**

OK

**AT+CSMP=17,167,0,0** (7bit encode of message to store or send in text mode)

OK

**AT+CMGW="13560243602"**

>abc<CTRL-Z> +CMGW: 5 OK

**AT+CSMP=17,167,0,4**

OK

**AT+CMGW="13560243602",129**

>abc<CTRL-Z> +CMGW:3

OK

**AT+CSMP=17,167,0,8**(16bit encode of message to store or send in text mode)

OK

**AT+CMGW="13560243602"**

>XXX<CTRL-Z> (Chinese string) +CMGW:4

OK

## 7.12 AT+CNMI New SMS Message Indications

AT+CNMI	
Syntax	
<b>Test Command</b> AT+CNMI=?	<b>Possible Returns:</b> +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
<b>Read Command</b> AT+CNMI?	<b>Possible Returns:</b> +CNMI:<mode>,<mt>,<bm>,<ds>,<bfr> OK
<b>Execute Command</b> AT+CNMI=<mode>[,<mt> [,<bm>[,<ds>[,<bfr>]]]]	<b>Possible Returns:</b> OK
Command Description	
Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active.	
Parameter Description	
<mode> Support one value now [0].	
0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.
3	Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.



AT+CNMI	
Parameter Description	
<mt> Support three values now: 0,1,2, and have no CLASS type.	
0	No SMS DELIVER indications are routed to the TE.
1	If SMS DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index>
2	SMS DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code:+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled) or +CMT: <oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>
3	Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
<bm> Broadcast-csw not supported.	
0	No CBM indications are routed to the TE.
1	If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:+CBMI: <mem>,<index>
2	New CBMs are routed directly to the TE using unsolicited result code:+CBM: <length><CR><LF><pdu> (PDU mode enabled)or+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled) If ME supports data coding groups which define special routing also for messages other than class
3	(e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1) . 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.
<ds> Message report can't be stored, the value 2 is not supported now.	
0	No SMS TATUS-REPORTs are routed to the TE.
1	SMS STATUS-REPORTs are routed to the TE using unsolicited result code:+CDS: <length><CR><LF><pdu> (PDU mode enabled)or+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (text mode enabled)
2	If SMS STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:+CDSI: <mem>,<index>

AT+CNMI	
Parameter Description	
<bfr> Not supported	
0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes).
1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.
Remark	
If PDU mode, each bit meaning of DCS byte are reference in chapter 11.10.5, CMGW remark.	
Example	
<b>AT+CNMI=0,1,0,0,0</b> +CI EV: "MESSAGE",1 +CMTI: "SM",7 OK <b>AT+CMGF=0</b> OK <b>AT+CNMI=0,2,0,0,0</b> +CI EV: "MESSAGE",1 +CMT: ,27 0891683110102105F0240D91683120117013F500008070206193930007F4F29C9E769F01 OK <b>AT+CMGF=1</b> OK <b>AT+CSDH=1</b> OK <b>AT+CNMI=0,2,0,0,0</b> OK +CI EV: "MESSAGE",1 +CMT: "+8613021107315"," 2019/10/31,12:48:32+32",145,17,0,0,"+8613010112500",145,8 testing <b>AT+CMGF=1</b> OK <b>AT+CNMI=0,0,0,1,0</b> OK <b>AT+CMGS="13445555991"</b> >abc<CTRL-Z> +CMGS: 12 OK +CDS: 2,12,"+8613021107315",129,"2019/10/31,12:49:37+32","2019/10/31,12:49:37+3",0	

## 7.13 AT+CPMS Preferred SMS Message Storage

AT+CPMS	
Syntax	
<b>Test Command</b> AT+CPMS=?	<b>Possible Returns:</b> +CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK
<b>Read Command</b> AT+CPMS?	<b>Possible Returns:</b> +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK
<b>Set Command</b> AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	<b>Possible Returns:</b> +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK
Command Description	
Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.	
Parameter Description	
<b>&lt;mem1&gt;</b>	
String type; memory from which messages are read and deleted.	
<b>&lt;mem2&gt;</b>	
String type; memory to which writing and sending operations are made.	
<b>&lt;mem3&gt;</b>	
String type; memory to which received SMs are preferred to be stored.	
<b>&lt;used1&gt;</b>	
Integer type; number of messages currently in <mem1>.	
<b>&lt;used2&gt;</b>	
Integer type; number of messages currently in <mem2>.	
<b>&lt;used3&gt;</b>	
Integer type; number of messages currently in <mem3>.	
<b>&lt;total1&gt;</b>	
Integer type; number of messages storable in <mem1>.	
<b>&lt;total2&gt;</b>	
Integer type; number of messages storable in <mem2>.	
<b>&lt;total3&gt;</b>	
Integer type; number of messages storable in <mem3>.	
Remark	
Parameters <mem1>,<mem2> and <mem3> have two kinds of values: "SM", "ME", "MT".	
<ul style="list-style-type: none"> <li>– "ME" ME message storage</li> <li>– "SM" (U)SIM message storage</li> <li>– "MT" Any of the storages associated with ME, current default is "SM"</li> </ul>	

**AT+CPMS****Example****AT+CPMS="SM","ME","SM"**

&lt;"SM" [SMS message storage in SIM, default]&gt;

+CPMS: 47,50,98,100,47,50

OK

**AT+CPMS?**

+CPMS: "SM",47,50,"ME",98,100,"SM",47,50

OK

**AT+CPMS="ME","ME","ME"**

+CPMS: 98,100,98,100,98,100

OK

**AT+CPMS?**

+CPMS: "ME",98,100,"ME",98,100,"ME",98,100

OK

**AT+CPMS="SM","SM","SM"**

+CPMS: 47,50,47,50,47,50

OK

**AT+CPMS?**

+CPMS: "SM",47,50,"SM",47,50,"SM",47,50

OK



## 7.14 AT+CSCA SMS Service Center Address

AT+CSCA	
Syntax	
<b>Test Command</b> AT+CSCA=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CSCA?	<b>Possible Returns:</b> +CSCA:<sca>,<tosca> OK
<b>Set Command</b> AT+CSCA=<sca>[,<tosca> ]	<b>Possible Returns:</b> OK
Command Description	
Set command updates the SMSC address.	
Parameter Description	
<b>&lt;sca&gt;</b>	
GSM 04.11 RP SC address Address-Value field in string format	
<b>&lt;tosca&gt;</b>	
GSM 04.11 RP SC address Type-of-Address octet in integer format	
Remark	
If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached. The read command returns the current Packet Domain service state. The test command is used for requesting information on the supported Packet Domain service states.	
Example	
<b>AT+CSCA="+8613800100500"</b> OK <b>AT+CSCA?</b> +CSCA: "+8613800100500",145 OK	

## 7.15 +CDS Indicates SMS Status Report Has Been Received

+CDS	
Possible Response	
+CDS: <length><CR><LF><pdu> (PDU mode enabled)	
+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)	
Command Description	
Indicates that SMS status report has been received.	
Parameter Description	
<pdu>	In the case of SMS: 3G TS 24.011 [6] SC address followed by 3G TS 23.040 [3] TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).
<length>	Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<fo>	Depending on the command or result code: first octet of 3G TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT SMSSTATUS-REPORT, or SMS-COMMAND in integer format is supported, in enhanced format (hexadecimal coded string with double quotes).
<scts>	3G TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<st>	3G TS 23.040 [3] TP-Status in integer format.
<mr>	3G TS 23.040 [3] TP-Message-Reference in integer format.
<ra>	3G TS 23.040 [3] TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3G TS 27.007 [9]); type of address given by <tora>.
<dt>	3G TS 23.040 [3] TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss:zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08".
<tora>	3G TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>).
Remark	
Please refer to +CNMI.	

**+CDS****Example****AT+CMGF=0**

OK

**AT+CNMI=0,0,0,1,0**

OK

**+CIEV: "MESSAGE",1**

OK

**AT+CMGF=1**

OK

**AT+CNMI=0,0,0,1,0**

OK

**AT+CMGS="13466507607"**

&gt;abc&lt;CTRL-Z&gt;

**+CMGS: 12**

OK

**+CDS: 2,14,"+8613021107315",129," 2019/10/31,12:53:26+32"," 2019/10/31,12:53:26+32 ",0**

中国移动  
China Mobile

## 7.16 AT+CMMS Set SMS Concat

AT+CMMS	
Syntax	
<b>Test Command</b> AT+CMMS=?	<b>Possible Returns:</b> +CMMS: (0,1) OK
<b>Read Command</b> AT+CMMS?	<b>Possible Returns:</b> +CMMS: <nConcat> OK
<b>Set Command</b> AT+CMMS=<nConcat>	<b>Possible Returns:</b> OK
Command Description	
Set SMS Concat include "long sms"(ture) and "common sms"(false).	
Parameter Description	
<nConcat> Integer type; indicates the concat value; default value is 0.	
0	Command sms
1	Long sms
Example	
<b>AT+CMMS?</b> +CMMS: 0 OK <b>AT+CMMS=?</b> +CMMS: (0,1) OK <b>AT+CMMS=1</b> OK <b>AT+CMMS?</b> +CMMS: 1 OK <b>AT+CMMS=</b> OK <b>AT+CMMS?</b> +CMMS: 0 OK	



## 7.17 AT+CSMS Select Message Service

AT+CSMS	
Syntax	
<b>Test Command</b> AT+CSMS=?	<b>Possible Returns:</b> +CSMS: (list of supported <service>s) OK
<b>Read Command</b> AT+CSMS?	<b>Possible Returns:</b> +CSMS: <service>,<mt>,<mo>,<bm> OK
<b>Set Command</b> AT+CSMS=<service>	<b>Possible Returns:</b> +CSMS: <mt>,<mo>,<bm> OK
Command Description	
<p>Set command selects messaging service &lt;service&gt;. It returns the types of messages supported by the ME: &lt;mt&gt; for mobile terminated messages, &lt;mo&gt; for mobile originated messages and &lt;bm&gt; for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: &lt;err&gt; shall be returned. See chapter Message Service Failure Result Code for a list of &lt;err&gt; values. Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.</p>	
Parameter Description	
<service> Integer type	
0	3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]
1	3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of <service> setting 1 is mentioned under corresponding command descriptions)
2...127	Reserved
128...	Manufacturer specific
<mt>, <mo>, <bm> Integer type	
* 0	Type not supported
* 1	Type supported

## 7.18 AT+CGSMS Select Service for MO SMS Messages

AT+CGSMS	
Syntax	
<b>Test Command</b> AT+CGSMS=?	<b>Possible Returns:</b> +CGSMS: (list of supported <service>s) OK
<b>Read Command</b> AT+CGSMS?	<b>Possible Returns:</b> +CGSMS: <service> OK
<b>Set Command</b> AT+CGSMS= <service>	<b>Possible Returns:</b> OK
Command Description	
The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.	
Parameter Description	
<b>&lt;service&gt;</b>	
A numeric parameter which indicates the service or service preference to be used 0 Packet Domain 1 circuit switched 2 Packet Domain preferred (use circuit switched if GPRS not available) 3 circuit switched preferred (use Packet Domain if circuit switched not available)	
Remark	
This command is NOT available now.	
Example	
<b>AT+CGSMS=?</b> +CGSMS: (0,1,2,3) OK <b>AT+CGSMS=0</b> OK <b>AT+CGSMS?</b> +CGSMS: 0 OK	

## 7.19 AT+CNMA ME/TA New Message Acknowledgement for

AT+CNMA	
Syntax	
<b>Execute Command</b> AT+CNMA	<b>Possible Returns:</b> +CMS ERROR: <err>
Command Description	
<p>Execution command confirms correct reception of a new message (SMS-DELIVER or SMSSTATUS-REPORT) which is routed directly to the TE (refer command +CNMI table 3.4.1-3 and table 3.4.1-5). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter &lt;service&gt; equals 1. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged. If ME does not get acknowledgement within required time (network timeout), ME should respond as specified in 3GPP TS 24.011 [6] to the network. ME/TA shall automatically disable routing to TE by setting both &lt;mt&gt; and &lt;ds&gt; values of +CNMI to zero. If command is executed, but no acknowledgement is expected, or some other ME related error occurs, final result code +CMS ERROR: &lt;err&gt; is returned. See chapter Message Service Failure Result Code for a list of &lt;err&gt; values.</p>	
Implementation	
Mandatory when <service> value 1 of command Select Message Service +CSMS is supported.	
Remark	
<p>In case that a directly routed message must be buffered in ME/TA (possible when +CNMI parameter &lt;mode&gt; equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using +CMGS), acknowledgement (RP-ACK) must be sent to the network without waiting +CNMA command from TE. Later, when buffered result codes are flushed to TE, TE must send +CNMA[=0] acknowledgement for each result code. In this way, ME/TA can determine if message should be placed in nonvolatile memory and routing to TE disabled (+CNMA[=0] not received). Refer to command +CNMI for more details how to use &lt;mode&gt; parameter reliably.</p> <p>Test command returns a list of supported &lt;n&gt; values. If the only value supported is 0, the device does not support sending of TPDU.</p>	

## 7.20 AT+CSCB Set Cell Broadcast Function

AT+CSCB	
Syntax	
<b>Test Command</b> AT+CSCB=?	<b>Possible Returns:</b> +CSCB:(0,1),(0,1,5,320-478,922),(0-3,5) OK
<b>Read Command</b> AT+CSCB?	<b>Possible Returns:</b> +CSCB:<mode>,"<mids>","<dcss>" OK
<b>Set Command</b> AT+CSCB=<mode>,"<mids>","<dcss>"	<b>Possible Returns:</b> OK
Command Description	
Set cell broadcast function related parameter.	
Parameter Description	
<mode> Integer type; indicates the mode.	
0	Message types specified in <mids> and <dcss> are accepted.
1	Message types specified in <mids> and <dcss> are not accepted.
<mids>	
String type; all different possible combinations of CBM message identifiers.	
<dcss>	
String type; all different possible combinations of CBM data coding schemas.	
Example	
<b>AT+CSCB=?</b> +CSCB:(0,1),(0,1,5,320-478,922),(0-3,5) OK <b>AT+CSCB?</b> +CSCB:1,"","" OK <b>AT+CSCB=1,"5","3"</b> OK	

# 8 GPRS Commands

## 8.1 AT+CGATT PS Attach or Detach

AT+CGATT	
Syntax	
<b>Test Command</b> AT+CGATT=?	<b>Possible Returns:</b> list of supported <state>s OK
<b>Read Command</b> AT+CGATT?	<b>Possible Returns:</b> +CGATT: <state>
<b>Set Command</b> AT+CGATT=<state>	<b>Possible Returns:</b> OK
Command Description	
The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.	
Parameter Description	
<state> Integer type; indicates the state of PS attachment.	
0	Detached
1	Attached
Remark	
If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached. The read command returns the current Packet Domain service state. The test command is used for requesting information on the supported Packet Domain service states.	
Example	
<b>AT+CGATT=1</b> OK <b>AT+CGATT=?</b> +CGATT:(0,1) OK	

## 8.2 AT+CGDCONT Define PDP Context

AT+CGDCONT	
Syntax	
<b>Test Command</b> AT+CGDCONT=?	<b>Possible Returns:</b> +CGDCONT: (range of supported <cid>s), <PDP_type>,(list of supported<d_comp>s), (list of supported <h_comp>s) [<CR><LF>   [+CGDCONT: (range of supported <cid>s), <PDP_type>,(list of supported <d_comp>s), (list of supported <h_comp>s)] OK
<b>Read Command</b> AT+CGDCONT?	<b>Possible Returns:</b> +CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>,<h_comp> [<CR><LF>   +CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp> OK
<b>Set Command</b> AT+CGDCONT=<cid>[,<PDP_type> [,<APN>,<PDP_addr> [<d_comp> [<h_comp>]]]]	<b>Possible Returns:</b> OK
Command Description	
This command be used to defined PDP context.	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; (PDP Context Identifier) 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 contextrelated commands. The range of permitted values (minimum value = 1, maximum value =7) is returned by the test form of the command.	
<b>&lt;PDP_type&gt;</b>	
Integer type; (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol IP Internet Protocol (IETF STD 5) IPV6 Internet Protocol, version 6 (IETF RFC 2460) IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301 [83]) PPP Point to Point Protocol (IETF STD 51) Non-IP Transfer of Non-IP data to external packet data network (see 3GPP TS 23.401 [82]).	
<b>&lt;APN&gt;</b>	
String type; (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.	
<b>&lt;PDP_address&gt;</b>	
String type; a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.	

**AT+CGDCONT****Parameter Description**

**<d\_comp>** Integer type; a numeric parameter that controls PDP data compression (applicable for SMDCP only) (refer 3GPP TS 04.65 [59]); other values are reserved.

0	Off (default if value is omitted)
---	-----------------------------------

1	On (manufacturer preferred compression)
---	---

2	V.42bis
---	---------

3	V.44bis
---	---------

**<h\_comp>** Integer type; a numeric parameter that controls PDP header compression (refer 3GPP TS 04.65 [59]); other values are reserved.

0	Off (default if value is omitted)
---	-----------------------------------

1	On (manufacturer preferred compression)
---	---

2	RFC1144
---	---------

3	RFC2507
---	---------

4	RFC3095
---	---------

**Example**

**AT+CGDCONT=?**

+CGDCONT: (1..7), (IP,IPV6,IPV4V6,PPP,Non-IP),(0..3),(0..4)

OK

**AT+CGDCONT=1, "IP", "cmnet"**

OK

**AT+CGDCONT?**

+CGDCONT:1,"IP", "cmnet", 0,0

OK

## 8.3 AT+CGACT PDP Context Activate or Deactivate

AT+CGACT	
Syntax	
<b>Test Command</b> AT+CGACT=?	<b>Possible Returns:</b> +CGACT: (list of supported<state>s) OK
<b>Read Command</b> AT+CGACT?	<b>Possible Returns:</b> +CGACT: <state> OK
<b>Set Command</b> AT+ CGACT=<state> [, <cid> [, <cid> []]]	<b>Possible Returns:</b> OK
Command Description	
<p>This command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts. If no &lt;cid&gt;s are specified the activation form of the command activates all defined contexts or deactivates all active contexts.</p>	
Parameter Description	
<b>&lt;state&gt;</b> Integer type; State indicates the state of PS attachment. Other values are reserved and will result in an ERROR response to the execution command.	
0	Deactivated
1	Activated
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). Range from 1 to 7.	
Remark	
<p>Before activating, use command AT+CGATT=1 first to attach to the network. Currently, only 3 active PDP contexts are allowed to exist simultaneity.</p> <p>So the number of cid in this command is limited to 3. And if you have defined more than 3 cids with command AT+CGDCONT, only the first 3 will be acted on when you use AT+CGACT=1 to activate all cids.</p>	
Example	
<b>AT+CGACT=?</b> +CGACT: (0,1) OK <b>AT+CGACT=1,1</b> OK <b>AT+CGACT?</b> +CGACT: (1,1)	



## 8.4 AT+CRC Cellular Result Codes

AT+CRC	
Syntax	
<b>Test Command</b> AT+CRC=?	<b>Possible Returns:</b> +CRC: (0,1) OK
<b>Read Command</b> AT+CRC?	<b>Possible Returns:</b> +CRC: <mode> OK
<b>Set Command</b> AT+CRC=<mode>	<b>Possible Returns:</b> OK
Command Description	
This command is to control whether or not the extended format of incoming call indication or GPRS network request for PDP context activation or notification for VBS/VGCS calls is used. When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING.	
Parameter Description	
<mode> Integer type	
0	Disables extended format (default)
1	Enables extended format
Example	
<b>AT+CRC=?</b> +CRC: (0,1) OK <b>AT+CRC=1</b> OK <b>AT+CRC?</b> +CRC: 1 OK	

## 8.5 AT+CGQMIN Quality of Service Profile (Minimum Acceptable)

AT+CGQMIN	
Syntax	
<b>Test Command</b> AT+CGQMIN=?	<b>Possible Returns:</b> +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)
<b>Set Command</b> AT+CGQMIN=<cid>[,<precedence> [,<delay>[,<reliability>.>[,<peak> [,<mean>]]]]]	<b>Possible Returns:</b> +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> OK
<b>Read Command</b> AT+CGQMIN?	<b>Possible Returns:</b> +CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [+CGQMIN: <cid>, <precedence>, <delay>, <reliability>., <peak>, <mean> [] OK
Command Description	
This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message. A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.	
Parameter Description	
<b>&lt;cid&gt;</b> Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	

AT+CGQMIN	
Parameter Description	
<precedence> Integer type; specifies the precedence class.	
0	Network subscribed value
1	High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3.
2	Normal priority. Service commitments shall be maintained ahead of precedence class 3.
3	Low priority. Service commitments shall be maintained ahead of precedence classes 1 and 2.
<delay> Integer type; specifies the delay class.	
0	Network subscribed value
1	< 0.5
2	< 5
3	< 50
4	Unspecified (Best Effort)
<reliability> Integer type; specify the reliability class.	
0	Network subscribed value
1	Non real-time traffic, error-sensitive application that cannot cope with data loss.
2	Non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS.
4	Real-time traffic, error-sensitive application that can cope with data loss.
5	Real-time traffic, error non-sensitive application that can cope with data loss.
<peak> Integer type; specify the peak throughput class. Class Peak Throughput (in octets per second).	
0	Network subscribed value
1	Up to 1 000 (8 kbit/s)
2	Up to 2 000 (16 kbit/s).
3	Up to 4 000 (32 kbit/s)
4	Up to 8 000 (64 kbit/s)
5	Up to 16 000 (128 kbit/s)
6	Up to 32 000 (256 kbit/s)
7	Up to 64 000 (512 kbit/s)
8	Up to 128 000 (1 024 kbit/s)
9	Up to 256 000 (2 048 kbit/s)

**AT+CGQMIN****Parameter Description**

**<mean>** Integer type; Class Peak Throughput (in octets per second).

<b>0</b>	Network subscribed value
<b>1</b>	(in octets per hour) 100 (~0.22 bit/s)
<b>2</b>	200 (~0.44 bit/s)
<b>3</b>	500 (~1.11 bit/s)
<b>4</b>	1 000 (~2.2 bit/s)
<b>5</b>	2 000 (~4.4 bit/s)
<b>6</b>	5 000 (~11.1 bit/s)
<b>7</b>	10 000 (~22 bit/s)
<b>8</b>	20 000 (~44 bit/s)
<b>9</b>	50 000 (~111 bit/s)
<b>10</b>	100 000 (~0.22 kbit/s)
<b>11</b>	200 000 (~0.44 kbit/s)
<b>12</b>	500 000 (~1.11 kbit/s)
<b>13</b>	1 000 000 (~2.2 kbit/s)
<b>14</b>	2 000 000 (~4.4 kbit/s)
<b>15</b>	5 000 000 (~11.1 kbit/s)
<b>16</b>	10 000 000 (~22 kbit/s)
<b>17</b>	20 000 000 (~44 kbit/s)
<b>18</b>	50 000 000 (~111 kbit/s)
<b>31</b>	Best effort

**<PDP\_type>** String type; (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.

<b>IP</b>	Internet Protocol (IETF STD 5)
<b>IPV6</b>	Internet Protocol, version 6 (IETF RFC 2460)
<b>IPV4V6</b>	Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301[83])
<b>PPP</b>	Point to Point Protocol (IETF STD 51)

**Example**

**AT+CGQMIN=?**

+CGQMIN: (IP,PPP,IPV6,IPV4V6), (0..3), (0..4), (0..5) , (0..9), (0..18,31)

OK

**AT+CGQMIN=1,1,1,1,1**

OK

**AT+CGQMIN?**

+CGQMIN: 1,1,1,1,1

+CGQMIN: 2,0,0,0,0

+CGQMIN: 3,0,0,0,0

OK

## 8.6 AT+CGPADDR Show PDP Address

AT+CGPADDR	
Syntax	
<b>Test Command</b> AT+CGPADDR=?	<b>Possible Returns:</b> +CGPADDR: (list of defined <cid>s) OK
<b>Set Command</b> AT+CGPADDR=<cid>[,<cid>[,]]	<b>Possible Returns:</b> +CGPADDR: <cid>,<PDP_addr>[<CR><LF> +CGPADDR: <cid>,<PDP_addr>[. . .] OK
Command Description	
The execution command returns a list of PDP addresses for the specified context identifiers.	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned.	
<b>&lt;PDP_address&gt;</b>	
String type; 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>. <PDP_address> is omitted if none is available.	
Example	
<b>AT+CGPADDR=?</b> +CGPADDR: (1,2,3) OK <b>AT+CGPADDR=1</b> +CGPADDR: 1,"10.14.57.241" OK	

## 8.7 AT+CGAUTO Automatic Response to a Network Request for PDP Context Activation

AT+CGAUTO	
Syntax	
<b>Test Command</b> AT+CGAUTO=?	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CGAUTO?	<b>Possible Returns:</b> <b>If close is successfully:</b> SHUT OK  <b>If close fails:</b> +CME ERROR <err>
<b>Set Command</b> AT+CGAUTO=<n>	<b>Possible Returns:</b> OK
Command Description	
The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.25ter 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.	
Parameter Description	
<n> Integer type	
0	Turn off automatic response for Packet Domain only; Packet DomainS network requests are manually accepted or rejected by the +CGANS command.
1	Turn on automatic response for Packet Domain only; Packet Domain network requests are automatically accepted according to the description above.
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.
3	Modem compatibility mode, Packet Domain only; 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 may also be used.) Circuit switched calls are handled as described elsewhere in this specification.

**AT+CGAUTO****Remark**

When the +CGAUTO=0 command is received, the MT shall not perform a PS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request. 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.25ter online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

**Example****AT+CGAUTO=?**

+CGAUTO: (0-3)

OK

**AT+CGAUTO=0**

OK

**AT+CGAUTO?**

+CGAUTO: 0



## 8.8 AT+CGQREQ Quality of Service Profile (Requested)

AT+CGQREQ	
Syntax	
<b>Test Command</b> AT+CGQREQ=?	<b>Possible Returns:</b> +CGQREQ: (list of supported) OK
<b>Read Command</b> AT+CGQREQ?	<b>Possible Returns:</b> +CGQREQ: <cid>, <precedence>, <delay>, <peak>, <mean> OK
<b>Set Command</b> AT+CGQREQ=<cid>[, <precedence> [, <delay>[, <reliability> [, <peak>[, <mean>]]]]]	<b>Possible Returns:</b> OK
Command Description	
This AT command be used to set the parameters of the QoS when MT send the PDP context message for activation.	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;precedence&gt;</b> Integer type; specifies the precedence class.	
0	Network subscribed value
1	High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3.
2	Normal priority. Service commitments shall be maintained ahead of precedence class 3.
3	Low priority. Service commitments shall be maintained ahead of precedence classes 1 and 2.
<b>&lt;delay&gt;</b> Integer type; specifies the delay class.	
0	Network subscribed value
1	1<0.5
2	<5
3	<50
4	Unspecified (Best Effort)



AT+CGQREQ	
Parameter Description	
<reliability> Integer type; specify the reliability class.	
0	Network subscribed value
1	Non real-time traffic, error-sensitive application that cannot cope with data loss.
2	Non real-time traffic, error-sensitive application that can cope with infrequent data loss.
3	Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS.
4	Real-time traffic, error-sensitive application that can cope with data loss.
5	Real-time traffic, error non-sensitive application that can cope with data loss.
<peak> Integer type; specify the peak throughput class.	
0	Network subscribed value
1	Up to 1 000 (8 kbit/s)
2	Up to 2 000 (16 kbit/s)
3	Up to 4 000 (32 kbit/s)
4	Up to 8 000 (64 kbit/s)
5	Up to 16 000 (128 kbit/s)
6	Up to 32 000 (256 kbit/s)
7	Up to 64 000 (512 kbit/s)
8	Up to 128 000 (1 024 kbit/s)
9	Up to 256 000 (2 048 kbit/s).
<mean> Integer type; specify the mean throughput class.	
0	Network subscribed value
1	(in octets per hour) 100 (~0.22 bit/s)
2	200 (~0.44 bit/s)
3	500 (~1.11 bit/s)
4	1 000 (~2.2 bit/s)
5	2 000 (~4.4 bit/s)
6	5 000 (~11.1 bit/s)
7	10 000 (~22 bit/s)
8	20 000 (~44 bit/s)
9	50 000 (~111 bit/s)
10	100 000 (~0.22 kbit/s)
11	200 000 (~0.44 kbit/s)
12	500 000 (~1.11 kbit/s)
13	1 000 000 (~2.2 kbit/s)
14	2 000 000 (~4.4 kbit/s)
15	5 000 000 (~11.1 kbit/s)
16	10 000 000 (~22 kbit/s)
17	20 000 000 (~44 kbit/s)
18	50 000 000 (~111 kbit/s)
31	Best effort

**AT+CGQREQ****Parameter Description**

**<PDP\_type>** Integer type; (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.

<b>IP</b>	Internet Protocol (IETF STD 5)
<b>IPV6</b>	Internet Protocol, version 6 (IETF RFC 2460)
<b>PPP</b>	Point to Point Protocol (IETF STD 51)

**Example****AT+CGQREQ=?**

+CGQREQ: IP,(0..3),(0..4), (0..5),(0..9),(0..18,31)

+CGQREQ: IPV6, (0..3), (0..4), (0..5) , (0..9), (0..18,31)

+CGQREQ: PPP, (0..3), (0..4), (0..5) , (0..9), (0..18,31)

OK

**AT+CGQREQ=1,1,1,1,1,1**

+CGQREQ:1,1,1,1,1,1

OK

**AT+CGQREQ?**

+CGQREQ: 1,1,1,1,1,1

+CGQREQ: 2,0,0,0,0,0

+CGQREQ: 3,0,0,0,0,0

OK

## 8.9 AT+CGREG GPRS Network Registration Status

AT+CGREG	
Syntax	
<b>Test Command</b> AT+CGREG=?	<b>Possible Returns:</b> +CGREG: (list of supported <n>s) OK
<b>Read Command</b> AT+CGREG?	<b>Possible Returns:</b> +CGREG: <n>,<stat>[,<lac>,<ci>] OK
<b>Set Command</b> AT+CGREG= <n>	<b>Possible Returns:</b> OK
Command Description	
This AT command be used to set and show the register information of MT and the position information of the MT.	
<b>Note:</b> When GPRS Network Registration Status changed,"+CGREG:<stat>" will not be reported automatically currently.	
Parameter Description	
<b>&lt;n&gt; Integer type</b>	
0	Disable network registration unsolicited result code.
1	Enable network registration unsolicited result code +CGREG: <stat>
2	Enable network registration and location information unsolicited result code +CGREG:<stat>[,<lac>,<ci>]
<b>&lt;stat&gt; Integer type</b>	
0	Not registered, MT is not currently searching an operator to register to. The UE is in GMM state GMM-NUL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, the UE is allowed to attach for GPRS if requested by the user.
1	Registered, home network. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on the home PLMN.
2	Not registered, but MT is currently trying to attach or searching an operator to register to. The UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.
3	Registration denied. The UE is in GMM state GMM-NUL. The GPRS service is disabled, the UE is not allowed to attach for GPRS if requested by the user.
4	Unknown
5	Registered, roaming. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN.
<b>&lt;lac&gt;</b>	
String type; two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)	

**AT+CGREG****Parameter Description****<ci>**

String type; two-byte cell ID in hexadecimal format

**Example****AT+CGREG=?**

+CGREG: (0-2)

OK

**AT+CGREG=2**

OK

**AT+CGREG?**

+CGREG: 2,1,"10DC","0D2B"

OK



中国移动  
China Mobile

## 8.10 ATD\*99\*\*\*1# Request GPRS Service

ATD*99***1#	
Syntax	
<b>Execute Command</b> ATD*99[*[<called_address>] [*[L2P][*<cid>]]#	<b>Possible Returns:</b> CONNECT OK
Command Description	
<p>Login the server, the IP of it be provided by DHCP of GGSN. This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN. The V.25ter 'D' (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocols. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.</p>	
Parameter Description	
<b>&lt;called_address&gt;</b>	
<p>String type; It's a 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 character comma ',' may be used as a substitute for the character period '.'.</p>	
<b>&lt;L2P&gt;</b>	
<p>String type; It's a string which indicates the layer 2 protocol to be used (see +CGDATA command). For communications software that does not support arbitrary characters in the dial string, the following numeric equivalents shall be used: "PPP".</p>	
<b>&lt;cid&gt;</b>	
<p>String type; It's a digit string which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p>	
Example	
<b>ATD*99***1# CONNECT</b> CONNECT dial GPRS service code and start up connecting.>	

## 8.11 AT+CGANS PDP Manual Response to a Nw Req For PDP Context Activation

AT+CGANS	
Syntax	
<b>Test Command</b> AT+CGANS=?	<b>Possible Returns:</b> +CGANS: (list of supported <response>s), (list of supported <L2P>s) OK
<b>Set Command</b> AT+CGANS=[<response>, [<L2P> , [<cid>]]]	<b>Possible Returns:</b> CONNECT . . . (data transfer) OK
Command Description	
<p>The execution 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. The &lt;response&gt; parameter allows the TE to accept or reject the request. Commands following the +CGANS command in the AT command line shall not be processed by the MT.</p>	
Parameter Description	
<b>&lt;response&gt;</b> Integer type; response is a numeric parameter which specifies how the request should be responded to.	
0	Reject the request (default value)
1	Accept and request that the PDP context be activated
<b>&lt;L2P&gt;</b> String type; a string parameter which indicates the layer 2 protocol to be used (see +CGDATA command).	
<b>&lt;cid&gt;</b> Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	
Example	
<b>AT+CGANS=?</b> CGANS: (0,1) ("PPP,IP,IPV6") OK	

## 8.12 AT+CGEREP Packet Domain Event Reporting

AT+CGEREP	
Syntax	
<b>Test Command</b> AT+CGEREP=?	<b>Possible Returns:</b> +CGEREP: (list of supported <mode>s),(list of supported <bfr>s)   OK
<b>Read Command</b> AT+CGEREP?	<b>Possible Returns:</b> +CGEREP: <mode>,<bfr> OK
<b>Set Command</b> AT+CGEREP=[<mode>[,<bfr>]]	<b>Possible Returns:</b> OK
Command Description	
This command is to 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.	
Parameter Description	
<mode> Integer type	
0	Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
1	Discard unsolicited result codes when MT TE link is reserved (e.g. in on line data mode); otherwise forward them directly to the TE.
2	Buffer unsolicited result codes in the MT when MT TE link is reserved (e.g. in on line data mode) and flush them to the TE when MT TE link becomes available; otherwise forward them directly to the TE.
<bfr> Integer type	
0	MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered.
1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

AT+CGEREP	
Unsolicited Result Codes	
URC1	+CGEV: REJECT <PDP_type>, <PDP_addr> A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. . .
URC2	+CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>] The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. . .
URC3	+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>] The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.
URC4	+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>] The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. . .
URC5	+CGEV: NW DETACH The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. . .
URC6	+CGEV: ME DETACH The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. . .
URC7	+CGEV: NW CLASS <class> The network has forced a change of UE class. The highest available class is reported (see +CGCLASS). . .
URC8	+CGEV: ME CLASS <class> The mobile termination has forced a change of UE class. The highest available class is reported (see +CGCLASS). . .
Example	
<b>AT+CGEREP=?</b> +CGEREP: (0,1),(0,1) OK <b>AT+CGEREP=1,1</b> OK <b>AT+CGEREP?</b> +CGEREP: 1,1 OK	



## 8.13 AT+CGDATA Enter Data State

AT+CGDATA	
Syntax	
<b>Test Command</b> AT+CGDATA=?	<b>Possible Returns:</b> +CGDATA: (list of supported <L2P>s) OK
<b>Set Command</b> AT+CGDATA=<L2P>,<cid>	<b>Possible Returns:</b> CONNECT . . . (data transfer) OK
Command Description	
<p>The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations. If the &lt;L2P&gt; 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.25ter online data state.</p> <p>Commands following +CGDATA command in the AT command line shall not be processed by the MT. The context shall be activated using the matched value for PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available then a dynamic address is requested.</p> <p>If no &lt;cid&gt; 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.</p> <p>After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.25ter command state is re-entered and the MT returns the final result code OK. In the event of an erroneous termination or a failure to start up, the V.25ter command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.</p>	
Parameter Description	
<b>&lt;L2P&gt;</b>	
String type; a string parameter that indicates the layer 2 protocol to be used between the TE and MT PPP Point-to-point protocol for a PDP such as IP	
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	
Remark	
This command may be used in both normal and modem compatibility modes. This command is NOT available now	
Example	
<b>AT+CGDATA=?</b> +CGDATA: ("PPP") OK <b>AT+CGDATA="PPP",1</b> CONNECT 115200	

## 8.14 AT+CGCLASS GPRS Mobile Station Class

AT+CGCLASS	
Syntax	
<b>Test Command</b> AT+CGCLASS=?	<b>Possible Returns:</b> +CGCLASS: (list of supported <class>s) OK
<b>Read Command</b> AT+CGCLASS?	<b>Possible Returns:</b> +CGCLASS: <class> OK
<b>Set Command</b> AT+CGCLASS=[<class>]	<b>Possible Returns:</b> OK
Command Description	
The set command is used to set the MT to operate according to the specified mode of operation, see TS 23.060 [47]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.	
Parameter Description	
<b>&lt;class&gt;</b> String type; a string parameter which indicates the mode of operation.	
<b>A</b>	Class-A mode of operation (A/Gb mode), or CS/PS mode of operation (lu mode) (highest mode of operation). It means that the MT would operate simultaneous PS and CS service.
<b>B</b>	Class-B mode of operation (A/Gb mode), (not applicable in lu mode). It means that the MT would operate PS and CS services but not simultaneously.
<b>CG</b>	Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (lu mode). It means that the MT would only operate PS services.
<b>CC</b>	Class-C mode of operation in CS only mode (A/Gb mode), or CS (lu mode) (lowest mode of operation). It means that the MT would only operate CS services.
<b>Note:</b> Other values are reserved and will result in an ERROR response to the set command. If the MT is attached to the PS domain when the set command is issued with a <class> = CC specified, a PS detach shall be performed by the MT.	
Example	
<b>AT+CGCLASS=?</b> +CGCLASS: ("CG","CC","B") OK <b>AT+CGCLASS="B"</b> OK <b>AT+CGCLASS?</b> +CGCLASS: "B" OK	

## 8.15 AT+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)

AT+CGEQMIN	
Syntax	
	<p><b>Possible Returns:</b></p> <p>+CGEQMIN: &lt;PDP_type&gt;,(list of supported &lt;Traffic class&gt;s),(list of supported &lt;Maximum bitrate UL&gt;s),(list of supported &lt;Maximum bitrate DL&gt;s),(list of supported &lt;Guaranteed bitrate UL&gt;s),(list of supported &lt;Guaranteed bitrate DL&gt;s),(list of supported &lt;Delivery order&gt;s),(list of supported &lt;Maximum SDU size&gt;s),(list of supported &lt;SDU error ratio&gt;s),(list of supported &lt;Residual bit error ratio&gt;s),(list of supported &lt;Delivery of erroneous SDUs&gt;s),(list of supported &lt;Transfer delay&gt;s),(list of supported &lt;Traffic handling priority&gt;s),(list of supported &lt;Source statistics descriptor&gt;s),(list of supported &lt;Signalling indication&gt;s)</p> <p>+CGEQMIN: &lt;PDP_type&gt;,(list of supported &lt;Traffic class&gt;s),(list of supported &lt;Maximum bitrate UL&gt;s),(list of supported &lt;Maximum bitrate DL&gt;s),(list of supported &lt;Guaranteed bitrate UL&gt;s),(list of supported &lt;Guaranteed bitrate DL&gt;s),(list of supported &lt;Delivery order&gt;s),(list of supported &lt;Maximum SDU size&gt;s),(list of supported &lt;SDU error ratio&gt;s),(list of supported &lt;Residual bit error ratio&gt;s),(list of supported &lt;Delivery of erroneous SDUs&gt;s),(list of supported &lt;Transfer delay&gt;s),(list of supported &lt;Traffic handling priority&gt;s),(list of supported &lt;Source statistics descriptor&gt;s),(list of supported &lt;Signalling indication&gt;s)</p> <p>[...]</p>
<p><b>Test Command</b></p> <p>AT+CGEQMIN=?</p>	

## AT+CGEQMIN

## Syntax

# Read Command

AT+CGEQMIN?

**Possible Returns:**

[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate  
UL>,<Maximum bitrate  
DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate 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>,<Signalling indication>]

+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate  
UL>,<Maximum bitrate  
DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate 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>,<Signalling indication>  
[...]]

[...]

**Set Command**

AT+CGEQMIN=[<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bi-  
trate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate  
DL>,<Delivery or-  
der>,<Maximum SDU size>,<SDU  
error ratio>,<Residual bit error  
ratio>,<Delivery  
of erroneous SDUs>,<Transfer  
delay>,<Traffic handling  
priority>,<Source statistics  
descriptor>,<Signalling  
indication>]]]]]]]]]]]]]]]

AT+CGEQMIN=[<cid>,<Traffic  
class>,<Maximum bitrate  
UL>,<Maximum bi-  
trate DL>,<Guaranteed bitrate  
UL>,<Guaranteed bitrate  
DL>,<Delivery or-  
der>,<Maximum SDU size>,<SDU  
error ratio>,<Residual bit error  
ratio>,<Delivery  
of erroneous SDUs>,<Transfer  
delay>,<Traffic handling  
priority>,<Source statistics  
descriptor>,<Signalling  
indication>]]]]]]]]]]]]]]]]]]

**Possible Returns:**

OK

**AT+CGEQMIN****Command Description**

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the PDP context establishment and PDP context modification procedures. The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. The specified profile will be stored in the MT and checked against the negotiated profile only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGEQMIN command is effectively an extension to these commands. 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, +CGEQMIN=<cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile. The read command returns the current settings for each defined context. The test command returns values supported as compound values. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

**Parameter Description****<cid>**

Integer type; specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).

**<PDP\_type>**

Integer type; specifies the type of packet data protocol (see the +CGDCONT command). Support IP, IPV6 and PPP currently. For the following parameters, see also 3GPP TS 23.107 [46].

**<Traffic class>**

Integer type; indicates the type of application for which the UMTS bearer service is optimised (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).

0	Conversational
1	Streaming
2	Interactive
3	Background

**<Maximum bitrate UL>**

Integer type; indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at an SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32,...) (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).

**<Maximum bitrate DL>**

Integer type; indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at an SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32,...) (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).

**<Guaranteed bitrate UL>**

Integer type; indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at an SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32,...) (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).

**<Guaranteed bitrate DL>**

Integer type; indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at an SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32,...) (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).

AT+CGEQMIN	
Parameter Description	
<b>&lt;Delivery order&gt;</b> Integer type; indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).	
0	No
1	Yes
<b>&lt;Maximum SDU size&gt;</b>	
Integer type; (1,2,3,...) indicates the maximum allowed SDU size in octets (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).	
<b>&lt;SDU error ratio&gt;</b>	
String type; 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 $5 \times 10^{-3}$ would be specified as "5E3" (e.g. AT+CGEQMIN=..., "5E3",...) (refer 3GPP TS24.008 [8] subclause 10.5.6.5).	
<b>&lt;Residual bit error ratio&gt;</b>	
String type; 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 $5 \times 10^{-3}$ would be specified as "5E3" (e.g. AT+CGEQMIN=..., "5E3",...) (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).	
<b>&lt;Delivery of erroneous SDUs&gt;</b>	
Integer type; indicates whether SDUs detected as erroneous shall be delivered or not (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).	
0	No
1	Yes
2	No detect
<b>&lt;Transfer delay&gt;</b>	
Integer type; (0,1,2,...) 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 [8] subclause 10.5.6.5).	
<b>&lt;Traffic handling priority&gt;</b>	
Integer type; (1,2,3,...) 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 [8] subclause 10.5.6.5).	
<b>&lt;Source Statistics Descriptor&gt;</b> Integer type; specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 [8] subclause 10.5.6.5).	
0	Characteristics of SDUs is unknown
1	Characteristics of SDUs corresponds to a speech source
<b>&lt;Signalling Indication&gt;</b> Integer type; indicates signalling 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 [8] subclause 10.5.6.5). If a value is omitted for a particular class then the value is considered to be unspecified.	
0	PDP context is not optimized for signalling
1	PDP context is optimized for signalling

## 8.16 AT+CGDSCONT Define Secondary PDP Context

AT+CGDSCONT	
Syntax	
<b>Test Command</b> AT+CGDSCONT=?	<b>Possible Returns:</b> +CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),(list of supported <d_comp>s),(list of supported <h_comp>s) OK
<b>Read Command</b> AT+CGDSCONT?	<b>Possible Returns:</b> [+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp> +CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>] OK
<b>Set Command</b> AT+CGDSCONT=[<cid>,<p_cid> [<d_comp>,<h_comp>]]	<b>Possible Returns:</b> OK
Command Description	
<p>The set command specifies PDP context parameter values for a Secondary PDP context identified by the(local) context identification parameter, &lt;cid&gt;. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.</p> <p>In EPS the command is used to define traffic flows. A special form of the set command, +CGDSCONT=&lt;cid&gt; causes the values for context number &lt;cid&gt; to become undefined.</p> <p><b>Note:</b></p> <p>If the initial PDP context is supported, the context with &lt;cid&gt;=0 is automatically defined at startup, see subclause 10.1.0.</p> <p>The read command returns the current settings for each defined context.</p> <p>The test command returns values supported as compound values.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.	
<b>Note:</b>	
The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.	
<b>&lt;p_cid&gt;</b>	
Integer type; 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.	
<b>&lt;d_comp&gt; Integer type</b>	
0	Off
1	On (manufacturer preferred compression)
2	V.42bis
3	V.44

**AT+CGDSCONT****Parameter Description**

**<h\_comp>** Integer type; controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]).

**0** Off

**1** On (Manufacturer preferred compression)

**2** RFC 1144 [105] (applicable for SNDCP only)

**3** RFC 2507 [107]

**4** RFC 3095 [108] (applicable for PDCP only)

**<IM\_CN\_Signalling\_Flag\_Ind>** Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

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

**1** UE indicates that the PDP context is for IM CN subsystem-related signalling only.

**Remark**

IM\_CN\_Signalling\_Flag\_Ind parameter not supported.



中国移动  
China Mobile



## 8.17 AT+CGTFT Traffic Flow Template

AT+CGTFT	
Syntax	
<b>Test Command</b> AT+CGTFT=?	<b>Possible Returns:</b> +CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s),(list of supported <local address and subnet mask>s) [<CR><LF>+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s),(list of supported <local address and subnet mask>s) [. . . ] OK
<b>Read Command</b> AT+CGTFT?	<b>Possible Returns:</b> [+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<local address and subnet mask>] [<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<local address and subnet mask> [. . . ] OK

**AT+CGTFT****Syntax****Set Command**

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

**Possible Returns:**

OK  
+CME ERROR <err>

**Command Description**

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060 [47]. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

The set command specifies a Packet Filter that is to be added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, <cid>. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGTFT command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGTFT=<cid> causes all of the Packet Filters in the TFT for context number <cid> to become undefined. At any time, there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

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

The test command returns values supported as compound values. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be used.

AT+CGTFT	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.	
<b>Note:</b>	
The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.	
<b>&lt;p_cid&gt;</b>	
Integer type; 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.	
<b>&lt;d_comp&gt;</b> Integer type; controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065 [61]).	
0	Off
1	On (Manufacturer preferred compression)
2	V.42bis
3	V.44
<b>&lt;h_comp&gt;</b> Integer type; controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]).	
1	On (Manufacturer preferred compression)
2	RFC 1144 [105] (applicable for SNDCP only)
3	RFC 2507 [107]
4	RFC 3095 [108] (applicable for PDCP only)
<b>&lt;IM_CN_Signalling_Flag_Ind&gt;</b> Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.	
0	UE indicates that the PDP context is not for IM CN subsystem-related signalling only.
1	UE indicates that the PDP context is for IM CN subsystem-related signalling only.
<b>&lt;PDP_type&gt;</b>	
String type; specifies the type of packet data protocol (see the +CGDCONT command).	
<b>&lt;packet filter identifier&gt;</b>	
Integer type; value range is from 1 to 16.	
<b>&lt;evaluation precedence index&gt;</b>	
Integer type; the value range is from 0 to 255.	
<b>&lt;remote address and subnet mask&gt;</b>	
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 for IPv6.   When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.	
<b>&lt;protocol number (ipv4) / next header (ipv6)&gt;</b>	
Integer type; value range is from 0 to 255.	

AT+CGTFT	
<b>&lt;local port range&gt;</b>	
String type; the string is given as dot-separated numeric (0-65535) parameters on the form "f.t".	
<b>&lt;remote port range&gt;</b>	
String type; the string is given as dot-separated numeric (0-65535) parameters on the form "f.t".	
<b>&lt;ipsec security parameter index (spi)&gt;</b>	
Integer type; numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.	
<b>&lt; type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask&gt;</b>	
String type; the string is given as dot-separated numeric (0-255) parameters on the form "t.m"	
<b>&lt;flow label (ipv6)&gt;</b>	
Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.	
<b>&lt;direction&gt;</b> Integer type. 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)
1	Uplink
2	Downlink
3	Birectional (Up & Downlink)
<b>&lt;local address and subnet mask&gt;</b>	
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. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.	
<b>Remark</b>	
Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].	

## 8.18 AT+CGCMOD PDP Context Modify

AT+CGCMOD	
Syntax	
<b>Test Command</b> AT+CGCMOD=?	<b>Possible Returns:</b> +CGCMOD:(list of <cid>s associated with active contexts) OK
<b>Set Command</b> AT+CGCMOD [= <cid> [, <cid> [, ...]]]	<b>Possible Returns:</b> OK +CME ERROR: <err>
Command Description	
<p>The execution command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs. After the command has completed, the MT returns to V.250 online data state. If the requested modification for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.</p> <p>For EPS, the modification request for an EPS bearer resource will be answered by the network by an EPS bearer modification request. The request must be accepted by the MT before the PDP context is effectively changed.</p> <p>If no &lt;cid&gt;s are specified the activation form of the command modifies all active contexts.</p> <p>The test command returns a list of &lt;cid&gt;s associated with active contexts.</p>	
Parameter Description	
<b>&lt;cid&gt;</b> Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	
Example	
<b>AT+CGCMOD=?</b> +CGCMOD: (1,.....7) OK <b>AT+CGCMOD=1</b> OK	

## 8.19 AT+CGPDNSADDR Get Active PDP DNS Address

AT+CGPDNSADDR	
Syntax	
<b>Test Command</b> AT+CGPDNSADDR=?	<b>Possible Returns:</b> +CGPDNSADDR:(list cids of actived pdp) OK
<b>Set Command</b> AT+CGPDNSADDR=[<list cids>]	<b>Possible Returns:</b> +CGPDNSADDR:[dns address] OK
Command Description	
This command allows the TE get all actived pdp dns address.	
Parameter Description	
<b>&lt;list cids&gt;</b> Integer type; which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.	
<b>Note:</b> The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.	

## 8.20 AT+CGCONTRDP PDP Context Read Dynamic Parameters

AT+CGCONTRDP	
Syntax	
	<p><b>Possible Returns:</b></p> <p>[+CGCONTRDP: &lt;cid&gt;,&lt;bearer_id&gt;,&lt;apn&gt; [,&lt;local_addr_and_subnet_mask&gt; [,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt;[,&lt;DNS_sec_addr&gt; [,&lt;P-CSCF_prim_addr&gt;[,&lt;P-CSCF_sec_addr&gt; [,&lt;IM_CN_Signalling_Flag&gt;[,&lt;LIPA_indication&gt; [,&lt;IPv4_MTU&gt;[,&lt;WLAN_Offload&gt; [,&lt;Local_Addr_Ind&gt;[,&lt;Non-IP_MTU&gt; [,&lt;Serving_PLMN_rate_control_value&gt; [,&lt;Reliable_Data_Service&gt; [,&lt;PS_Data_Off_Support&gt; [,&lt;PDU_session_id&gt;,&lt;QFI&gt;[,&lt;SSC_mode&gt; [,&lt;S-NSSAI&gt;[,&lt;Access_type&gt; [,&lt;RQ_timer&gt; [,&lt;Always-on_ind&gt;]]]]]]]]]]]]]]]]]]] [&lt;CR&gt;&lt;LF&gt;+CGCONTRDP: &lt;cid&gt;, &lt;bearer_id&gt;,&lt;apn&gt;[,&lt;local_addr_and_subnet_mask&gt; [,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt; [,&lt;DNS_sec_addr&gt;[,&lt;P-CSCF_prim_addr&gt; [,&lt;P-CSCF_sec_addr&gt;[,&lt;IM_CN_Signalling_Flag&gt; [,&lt;LIPA_indication&gt; [,&lt;IPv4_MTU&gt;[,&lt;WLAN_Offload&gt; [,&lt;Local_Addr_Ind&gt;[,&lt;Non-IP_MTU&gt; [,&lt;Serving_PLMN_rate_control_value&gt; [,&lt;Reliable_Data_Service&gt; [,&lt;PS_Data_Off_Support&gt; [,&lt;PDU_session_id&gt;,&lt;QFI&gt;[,&lt;SSC_mode&gt; [,&lt;S-NSSAI&gt;[,&lt;Access_type&gt; [,&lt;RQ_timer&gt; [,&lt;Always-on_ind&gt;]]]]]]]]]]]]]]]]]]] [. . . ]]</p>
<p><b>Set Command</b></p> <p>AT+CGCONTRDP[=&lt;cid&gt;]</p>	
<p><b>Test Command</b></p> <p>AT+CGCONTRDP=?</p>	<p><b>Possible Returns:</b></p> <p>+CGCONTRDP: (list of &lt;cid&gt;s associated with active contexts)   OK</p>

**AT+CGCONTRDP****Command Description**

The execution command returns the relevant information <bearer\_id>, <apn>, <local\_addr and subnet\_mask>, <gw\_addr>, <DNS\_prim\_addr>, <DNS\_sec\_addr>, <P-CSCF\_prim\_addr>, <P-CSCF\_sec\_addr>, <IM\_CN\_Signalling\_Flag>, <LIPA\_indication>, <IPv4\_MTU>, <WLAN\_Offload>, <Non-IP\_MTU>, <Serving\_PLMN\_rate\_control\_value>, <Reliable\_Data\_Service>, <PS\_Data\_Off\_Support>, <PDU\_session\_id>, <QFI>, <SSC\_mode>, <S-NSSAI>, <Access\_type>, <RQ\_timer> and <Always-on\_ind> for an active non secondary PDP context or a QoS flow of the default QoS rule with the context identifier <cid>.

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

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

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

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

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

**Parameter Description****<cid>**

Integer type; specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

**<bearer\_id>**

Integer type; identifies the bearer, i.e. the EPS bearer and the NSAPI.

**<apn>**

String type; a logical name that was used to select the GGSN or the external packet data network.

**<local\_addr and subnet\_mask>**

String type; 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.

**<gw\_addr>**

String type; shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters.

**<DNS\_prim\_addr>**

String type; shows the IP address of the primary DNS server.

**<DNS\_sec\_addr>**

String type; shows the IP address of the secondary DNS server.



AT+CGCONTRDP	
Parameter Description	
<P_CSCF_prim_addr>	
String type; shows the IP address of the primary P-CSCF server.	
<P_CSCF_sec_addr>	
String type; shows the IP address of the secondary P-CSCF server.	
<IM_CN_Signalling_Flag>	
Integer type; shows 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	
<LIPA_indication> Integer type; indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE.	
0	Indication not received that the PDP context provides connectivity using a LIPA PDN connection
1	Indication received that the PDP context provides connectivity using a LIPA PDN connection
<IPv4_MTU>	
Integer type; shows the IPv4 MTU size in octets.	
<WLAN_Offload> Integer type; indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bits 1 and 2 of the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.	
0	Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is not acceptable.
1	Offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in lu mode.
2	Offloading the traffic of the PDN connection via a WLAN when in lu mode is acceptable, but not acceptable in S1 mode.
3	Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is acceptable.
<Local_Addr_Ind> Integer type; indicates whether or not the MS and the network support local IP address in TFTs (see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3).	
0	Undicates that the MS or the network or both do not support local IP address in TFTs.
1	Indicates that the MS and the network support local IP address in TFTs.
<Non-IP_MTU>	
Integer type; shows the Non-IP MTU size in octets.	
<Serving_PLMN_rate_control_value>	
Integer type; indicates the maximum number of uplink messages the UE is allowed to send in a 6-minute interval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in 3GPP TS 24.301 [8] subclause 9.9.4.28.	

AT+CGCONTRDP	
Parameter Description	
<b>&lt;Reliable_Data_Service&gt;</b> Integer type; indicates whether the UE is using Reliable Data Service for a PDN connection or not, see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3.	
0	Reliable Data Service is not being used for the PDN connection.
1	Reliable Data Service is being used for the PDN connection.
<b>&lt;PS_Data_Off_Support&gt;</b> Integer type; indicates whether the network supports PS data off or not, see 3GPP TS 24.301 [83] subclause 6.3.10 and 3GPP TS 24.501 [161] subclause 6.2.10.	
0	Indicates that the network does not support PS data off.
1	Indicates that the network supports PS data off.
<b>&lt;PDU_session_id&gt;</b>	
Integer type; identifies the PDU session, see 3GPP TS 24.501 [161].	
<b>&lt;QFI&gt;</b>	
Integer type; identifies the QoS flow, see 3GPP TS 24.501 [161].	
<b>&lt;SSC_mode&gt;</b> Integer type; indicates the session and service continuity (SSC) mode for the PDU session in 5GS, see 3GPP TS 23.501 [165].	
0	Indicates that the PDU session is associated with SSC mode 1.
1	Indicates that the PDU session is associated with SSC mode 2.
2	Indicates that the PDU session is associated with SSC mode 3.
<b>&lt;S-NSSAI&gt;</b>	
String type; indicates the S-NSSAI associated with the PDU session for identifying a network slice in 5GS, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161]. Refer parameter <S-NSSAI> in subclause 10.1.1.	
<b>&lt;Access_type&gt;</b> Integer type; indicates the access type over which the PDU session is established in 5GS, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].	
0	Indicates that the preferred access type is 3GPP access.
1	Indicates that the preferred access type is non-3GPP access.
<b>&lt;RQ_timer&gt;</b>	
Integer type; indicates the timer for reflective QoS, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].	
<b>&lt;Always-on_ind&gt;</b> Integer type; indicates whether the PDU session is an always-on PDU session, see 3GPP TS 24.501 [161].	
0	Indicates that the PDU session is not an always-on PDU session.
1	Indicates that the PDU session is an always-on PDU session.

## 8.21 AT+CGSCONTRDP Secondary PDP Context Read

### Dynamic Parameters

AT+CGSCONTRDP	
Syntax	
<b>Set Command</b> AT+CGSCONTRDP[=<cid>]	<b>Possible Returns:</b> [+CGSCONTRDP: <cid>,<p_cid>,<bearer_id> [,<IM_CN_Signalling_Flag>,<WLAN_Offload> [,<PDU_session_id>,<QFI>]]] [<CR><LF>+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>,<IM_CN_Signalling_Flag> [,<WLAN_Offload>,<PDU_session_id>,<QFI>]]] [. . . ]
<b>Test Command</b> AT+CGSCONTRDP=?	<b>Possible Returns:</b> +CGSCONTRDP: (list of <cid>s associated with active contexts)   OK
Command Description	
<p>The execution command returns &lt;p_cid&gt;, &lt;bearer_id&gt;, &lt;IM_CN_Signalling_Flag&gt;, &lt;WLAN_Offload&gt;, &lt;PDU_session_id&gt; and &lt;QFI&gt; for an active secondary PDP context or a QoS flow of non-default QoS rule with the context identifier &lt;cid&gt;.</p> <p>If the parameter &lt;cid&gt; is omitted, the &lt;cid&gt;, &lt;p_cid&gt;, &lt;bearer_id&gt;, &lt;IM_CN_Signalling_Flag&gt;, &lt;WLAN_Offload&gt;, &lt;PDU_session_id&gt; and &lt;QFI&gt; are returned for all active secondary PDP contexts or all QoS flows of non-default QoS rule.</p> <p>In EPS, the Traffic Flow parameters are returned.</p> <p><b>Note:</b></p> <p>Parameters for UE initiated and network-initiated PDP contexts are returned.</p> <p>The test command returns a list of &lt;cid&gt;s associated with active secondary PDP contexts.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular active secondary PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;p_cid&gt;</b>	
Integer type; specifies a particular PDP context definition or default EPS context Identifier which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface (see the +CGDSCONT command).	
<b>&lt;bearer_id&gt;</b>	
Integer type; identifies the bearer, EPS Bearer and NSAPI.	
<b>&lt;IM_CN_Signalling_Flag&gt;</b> Integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.	
<b>0</b>	PDP context is not for IM CN subsystem-related signalling only.
<b>1</b>	PDP context is for IM CN subsystem-related signalling only.

AT+CGSCONTRDP	
Parameter Description	
<b>&lt;WLAN_Offload&gt;</b> Integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bits 1 and 2 of the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.	
0	Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is not acceptable.
1	Offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in lu mode.
2	Offloading the traffic of the PDN connection via a WLAN when in lu mode is acceptable, but not acceptable in S1 mode.
3	Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is acceptable.
<b>&lt;PDU_session_id&gt;</b>	
Integer type; identifies the PDU session, see 3GPP TS 24.501 [161].	
<b>&lt;QFI&gt;</b>	
Integer type; identifies the QoS flow, see 3GPP TS 24.501 [161].	
Remark	
IM_CN_Signalling_Flag_Ind parameter not supported	



## 8.22 AT+CGTFTRDP Traffic Flow Template Read Dynamic Parameters

AT+CGTFTRDP	
Syntax	
<b>Set Command</b> AT+CGTFTRDP[=<cid>]	<b>Possible Returns:</b> [+CGTFTRDP: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<NW packet filter Identifier>,<local address and subnet mask>,<QRI>] [<CR><LF>+CGTFTRDP: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<NW packet filter Identifier>,<local address and subnetmask>,<QRI>[. . .]]
<b>Test Command</b> AT+CGTFTRDP=?	<b>Possible Returns:</b> +CGTFTRDP: (list of <cid>s associated with active contexts) OK
Command Description	
<p>The execution command returns the relevant information about Traffic Flow Template for an active secondary or non secondary PDP context specified by &lt;cid&gt; together with the additional network assigned values when established by the network. If the parameter &lt;cid&gt; is omitted, the Traffic Flow Templates for all active secondary and non secondary PDP contexts are returned.</p> <p>Parameters of both network and MT/TA initiated PDP contexts will be returned.</p> <p>The test command returns a list of &lt;cid&gt;s associated with active secondary and non secondary contexts.</p>	

AT+CGTFTRDP	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular secondary or non secondary PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).	
<b>&lt;packet filter identifier&gt;</b>	
Integer type; the value range is from 1 to 16.	
<b>&lt;evaluation precedence index&gt;</b>	
Integer type; the value range is from 0 to 255.	
<b>&lt;remote address and subnet mask&gt;</b>	
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.	
<b>&lt;protocol number (ipv4) / next header (ipv6)&gt;</b>	
Integer type; the value range is from 0 to 255.	
<b>&lt;local port range&gt;</b>	
String type; the string is given as dot-separated numeric (0-65535) parameters on the form "f.t"	
<b>&lt;remote port range&gt;</b>	
String type; the string is given as dot-separated numeric (0-65535) parameters on the form "f.t".	
<b>&lt;ipsec security parameter index (spi)&gt;</b>	
Integer type; numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.	
<b>&lt;type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask&gt;</b>	
String type; the string is given as dot-separated numeric (0-255) parameters on the form "t.m".	
<b>&lt;flow label (ipv6)&gt;</b>	
Integer type; numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.	
<b>&lt;direction&gt;</b> Integer type. Specifies the transmission direction in which the Packet Filter shall be applied.	
<b>0</b>	Pre-Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162)
<b>1</b>	Uplink
<b>2</b>	Downlink
<b>3</b>	Bidirectional (Used for Uplink and Downlink).
<b>&lt;NW packet filter Identifier&gt;</b>	
Integer type; the value range is from 1 to 16. In EPS the value is assigned by the network when established.	
<b>&lt;local address and subnet mask&gt;</b>	
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.	
<b>&lt;QRI&gt;</b>	
Integer type; identifies the QoS rule, see 3GPP TS 23.501 [165] and 3GPP TS 24.501 [161].	

## 8.23 AT+CGDEL Delete Non-active PDP Contexts

AT+CGDEL	
Syntax	
<b>Set Command</b> AT+CGDEL[=<cid>]	<b>Possible Returns:</b> [+CGDEL: <cid>[,<cid>[. . . ]]] +CME ERROR: <err>
<b>Test Command</b> AT+CGTFTTRDP=?	<b>Possible Returns:</b> +CIPCCFG:<NmRetry>,<WaitTm>,<SendSz>,<esc>, <Rxmode>,<RxSize>,< Rxtimer > OK
Comamnd Description	
<p>The execution command +CGDEL=&lt;cid&gt; removes the indicated PDP context and removes all associated data related to the indicated PDP contexts that are not activated. The AT command will not delete or remove information for activated PDP contexts. The removed PDP context is listed by the +CGDEL: &lt;cid&gt; intermediate result code. If the initial PDP context is supported (see subclause 10.1.0), +CGDEL=0 will return ERROR and the context will not be removed.</p> <p>If &lt;cid&gt; points to a primary PDP context, the PDP context will be deleted together with all linked secondary PDP contexts if none of the PDP contexts are activated.</p> <p>If &lt;cid&gt; points to a secondary PDP context, the PDP context will be deleted if it is not activated. A special form of the command can be given as +CGDEL (with the =&lt;cid&gt; omitted). In this form, all primary PDP contexts that are not activated or have any activated secondary PDP contexts will be removed and all secondary PDP contexts that are not activated will be removed. The associated data of all the deleted PDP contexts will be removed, and the removed PDP context are listed by the +CGDEL: &lt;cid&gt;[,&lt;cid&gt;[. . . ]]] intermediate result code. Activated PDP contexts will not cause this form of the command to return ERROR or +CME ERROR.</p> <p>If the initial PDP context is supported (see subclause 10.1.0), +CGDEL (with the =&lt;cid&gt; omitted) will not cause the initial PDP context to be removed or cause +CGDEL to return ERROR.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	

## 8.24 AT+CSCON Signalling Connection Status

AT+CSCON	
Syntax	
<b>Set Command</b> AT+CSCON=[<n>]	<b>Possible Returns:</b> +CME ERROR: <err>
<b>Read Command</b> AT+CSCON?	<b>Possible Returns:</b> +CSCON: <n>,<mode>[,<state>[,<access>]] [<CR><LF>+CSCON: <n>,<mode>[,<state>[,<access>[,<coreNetwork>]]] [...]] +CME ERROR: <err>
<b>Test Command</b> AT+CSCON=?	<b>Possible Returns:</b> +CSCON: (list of supported <n>s)
Command Description	
<p>The set command controls the presentation of an unsolicited result code +CSCON.</p> <ul style="list-style-type: none"> <li>– If &lt;n&gt;=1, +CSCON: &lt;mode&gt; is sent from the MT when the connection mode of the MT is changed.</li> <li>– If &lt;n&gt;=2 and there is a state within the current mode, +CSCON: &lt;mode&gt;[,&lt;state&gt;] is sent from the MT when the connection mode or state information of the MT is changed.</li> <li>– If &lt;n&gt;=3, +CSCON: &lt;mode&gt;[,&lt;state&gt;[,&lt;access&gt;]] is sent from the MT when the connection mode, state or access information of the MT is changed.</li> <li>– If &lt;n&gt;=4, +CSCON: &lt;mode&gt;[,&lt;state&gt;[,&lt;access&gt;[,&lt;coreNetwork&gt;]]] is sent from the MT. If setting fails, an MT error, +CME ERROR: &lt;err&gt; is returned.</li> </ul> <p>When the MT is in UTRAN, E-UTRAN or NG-RAN, the &lt;mode&gt; refers to idle when no PS signalling connection between UE and network is setup 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 &lt;state&gt; indicates the state of the MT when the MT is in GERAN, UTRAN connected mode, E-UTRAN or NG-RAN. The &lt;access&gt; indicates the current radio access type of the MT when the MT is in GERAN, UTRAN, E-UTRAN or NG-RAN. The &lt;coreNetwork&gt; indicates the core network type the MT is connected to when the MT is in E-UTRAN or NG-RAN. The read command returns the status of result code presentation and an integer &lt;mode&gt; which shows whether the MT is currently in idle mode or connected mode. State information &lt;state&gt; is returned only when &lt;n&gt;=2. Radio access type information &lt;access&gt; is returned only when &lt;n&gt;=3. Core network type information &lt;coreNetwork&gt; is returned only when &lt;n&gt;=4. For Multi-RAT Dual Connectivity (MR-DC) architecture (see 3GPP TS 37.340 [162]), information is presented for the master RAT followed by optionally, information for each of the secondary RATs on a separate line. Test command returns supported values as a compound value.</p>	
Parameter Description	
<n> Integer type	
0	Disable unsolicited result code
1	Enable unsolicited result code +CSCON: <mode>
2	Enable unsolicited result code +CSCON: <mode>[,<state>]
3	Enable unsolicited result code +CSCON: <mode>[,<state>[,<access>]]



AT+CSCON	
Parameter Description	
<mode> Integer type; indicates the signalling connection status	
0	Idle
1	Connected
<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, E-UTRAN and NG-RAN.	
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
8	NG-RAN connected states
9	NG-RAN inactive state (see 3GPP TS 38.331 [160])
<access> Integer type; indicates the current radio access type.	
0	Indicates usage of radio access of type GERAN, see 3GPP TS 45.001 [146].
1	Indicates usage of radio access of type UTRAN TDD, see 3GPP TS 25.212 [144].
2	Indicates usage of radio access of type UTRAN FDD, see 3GPP TS 25.212 [144].
3	Indicates usage of radio access of type E-UTRA TDD, see 3GPP TS 36.300 [145].
4	Indicates usage of radio access of type E-UTRA FDD, see 3GPP TS 36.300 [145].
5	Indicates usage of radio access of type NR, see 3GPP TS 38.300 [159].
<coreNetwork> Integer type; indicates the core network type the UE is connected to.	
0	Indicates MT is connected to EPC, see 3GPP TS 23.401 [82].
1	Indicates MT is connected to 5GCN, see 3GPP TS 23.501 [165].

## 8.25 AT+CSODCP Sending of Originating Data via the Control Plane

AT+CSODCP	
Syntax	
<b>Test Command</b> AT+CSODCP=?	<b>Possible Returns:</b> +CSODCP: (0~7), (400), (0~2), (0~1) OK
<b>Read Command</b> AT+CSCON?	<b>Possible Returns:</b> +CSCON: <n>,<mode>[,<state>[,<access>]] [<CR><LF>+CSCON: <n>,<mode>[,<state>[,<access>[,<coreNetwork>]]] [...]] +CME ERROR: <err>
<b>Set Command</b> AT+CSODCP=<cid>, <cpdata_length>,<cpdata> [,<RAI>[,<type_of_user_data>]]	<b>Possible Returns:</b> OK +CME ERROR: <err>
Command Description	
<p>The set command is used by the TE to transmit data over control plane to network via MT. Context identifier &lt;cid&gt; is used to link the data to particular context.</p> <p>This command optionally indicates that the application on the MT expects that the exchange of data: will be completed with this uplink data transfer; or will be completed with the next received downlink data.</p> <p>This command also optionally indicates whether or not the data to be transmitted is an exception data. If the UE is using Reliable Data Service to transmit data, then this command optionally also indicates the source port number used by the originator, the destination port number to be used by the receiver and whether the originator is soliciting an acknowledgement from the receiver as defined in 3GPP TS 24.250 [168].</p> <p>This command causes transmission of an ESM DATA TRANSPORT message, as defined in 3GPP TS 24.301 [83].</p>	
Parameter Description	
<b>&lt;cid&gt;</b> Integer type; a numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;cpdata_length&gt;</b> Integer type; indicates the number of octets of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.	
<b>&lt;cpdata&gt;</b> String type; contains the user data container contents (refer 3GPP TS 24.301 [83] subclause 9.9.4.24). When there is no data to transmit, the <cpdata> shall be an empty string (""). This parameter shall not be subject to conventional character conversion as per +CSCS. The coding format of the user data container and the maximum length of <cpdata> are implementation specific.	

**AT+CSODCP****Parameter Description**

**<RAI>** Integer type. Indicates the value of the release assistance indication, refer 3GPP TS 24.301 [83] subclause 9.9.4.25.

<b>0</b>	No information available.
<b>1</b>	The MT expects that exchange of data will be completed with the transmission of the ESM DATA TRANSPORT message.
<b>2</b>	The MT expects that exchange of data will be completed with the receipt of an ESM DATA TRANSPORT message.

**<type\_of\_user\_data>** Integer type. Indicates whether the user data that is transmitted is regular or exceptional.

<b>0</b>	Regular data.
<b>1</b>	Exception data.



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## 8.26 AT+CGAUTH Define PDP Context Authentication Parameters

AT+CGAUTH	
Syntax	
<b>Set Command</b> AT+CGAUTH=<cid>[,<auth_prot>[,<userid>,<password>]]	<b>Possible Returns:</b> +CME ERROR: <err>
<b>Read Command</b> AT+CGAUTH?	<b>Possible Returns:</b> [+CGAUTH: <cid>,<auth_prot>,<userid>,<password>] [<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password>[. . .]]
<b>Test Command</b> AT+CGAUTH=?	<b>Possible Returns:</b> +CGAUTH: (range of supported <cid>s), (list of supported <auth_prot>s), (range of supported <userid>s), (range of supported <password>s)
Command Description	
<p>Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter &lt;cid&gt; used during the PDP context activation and the PDP context modification procedures. Since the &lt;cid&gt; is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, +CGAUTH is effectively as an extension to these commands.</p> <p>A special form of the set command, +CGAUTH=&lt;cid&gt; causes the authentication parameters for context number &lt;cid&gt; to become undefined.</p> <p>The read command returns the current settings for each defined context.</p> <p>The test command returns values supported as compound values.</p>	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;auth_prot&gt;</b> Integer type. Authentication protocol used for this PDP context.	
0	None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified.
1	PAP
2	CHAP
<b>&lt;userid&gt;</b>	
String type; user name for access to the IP network.	
<b>&lt;password&gt;</b>	
String type; password for access to the IP network.	
Example	
<b>AT+CGAUTH=?</b> +CGAUTH: <cid>,<auth_prot>,<userid>,<password>][<CR><LF>[. . .]] OK <b>AT+CGAUTH=1,0,"Y6dNgXbuLRsTzcbD1aNL","0YSaZW rR9lhCkeuBt9gC"</b> OK	

## 8.27 AT+MPING Start Ping IP Address or Host

AT+MPING	
Syntax	
<b>Set Command</b> AT+MPING=<host>[,<timeout>[,<ping_num>[,<packet_len>[,<context_id>]]]] AT+MPING=<domain name>[,<timeout>[,<ping_num>[,<packet_len>[,<context_id>]]]]	<b>Possible Returns:</b> OK <result>[,<ip_address>, bytes = <packet_len>, time = <replyTime>(ms), TTL = <ttd>]<CR><LF> <result>[,<ip_address>, bytes = <packet_len>, time = <replyTime>(ms), TTL = <ttd>]<CR><LF> [...]  MPING statistics for <IP address>: "total": sent = <nsendPackage>, lost = <nlostPackage><lostRange>%, min_delay = <min_replyTime>(ms), max_time = <max_replyTime>(ms)
<b>Test Command</b> AT+MPING=?	<b>Possible Returns:</b> +MPING: "host", [timeout(1~255), [ping_num(1~65535), [packet_len(36~1500,ipv4)(56~1500,ipv6), [context_id(1-7)]]]]
Command Description	
This command is used to ping address or host.	
Parameter Description	
<b>&lt;result&gt;</b>	
Integer type; ping ICMP package result (0-success, others-failed).	
<b>&lt;host&gt;</b>	
String type; a string parameter which indicates ping IP address.	
<b>&lt;domain name&gt;</b>	
String type; a string parameter which indicates ping domain name.	
<b>&lt;timeout&gt;</b>	
Integer type; ping ICMP package timeout (1~255).	
<b>&lt;packet_len&gt;</b>	
Integer type; ping ICMP package size (36~1500 ipv4) (56~1500 ipv6).	
<b>&lt;ping_num&gt;</b>	
Integer type; ping ICMP package send times (1~65535).	
<b>&lt;replyTime&gt;</b>	
Integer type; time, in units of ms, required to receive the response.	
<b>&lt;ttd&gt;</b>	
Integer type; time to live	
<b>&lt;nlostPackage&gt;</b>	
Integer type; lost package number	
<b>&lt;lostRange&gt;</b>	
Integer type; lost package range	

AT+MPING	
Parameter	Description
<b>&lt;nsendPackage&gt;</b>	
	Integer type; send package number
<b>&lt;context_id&gt;</b>	
	Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).



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## 8.28 AT+CFGCLOT CIOT Feature Configuration

AT+CFGCLOT	
Syntax	
<b>Test Command</b> AT+CFGCLOT=?	<b>Possible Returns:</b> +CFGCLOT: nonip=[0-1], cpciot=[0-1](NBloT Ignore), upciot=[0-3], erwopdn=[0-2], sms_wo_comb_att=[0-1], apn_rate_control=[0-1], epco=[0-1], cpbackoff=[0-1], roam=[0-1] OK
<b>Set Command</b> AT+CFGCLOT=<nonip>[,<cpciot> [,<upciot>[,<erwopdn> [,<sms_wocomb_att> [,<apn_rate_control>[,epco>]]]]]]	<b>Possible Returns:</b> OK
<b>Read Command</b> AT+CFGCLOT?	<b>Possible Returns:</b> +CFGCLOT: <nonip>[,<cpciot>[,<upciot> [,<erwopdn>[,<sms_wocomb_att> [,<apn_rate_control>[,epco>]]]]]] OK
Command Description	
Configure and query the CIOT parameters.	
Parameter Description	
<nonip> Integer type; configure NonIP.	
0	Not support NonIP
1	Support NonIP
<cpciot> Integer type; configure CPCIOT.	
0	Not support CPCIoT, this value is not configured for NB-IoT.
1	Support CPCIoT
<upciot> Integer type; configure whether the UPCIoT feature is supported and preferred.	
0	Not support S1uData and UPCIoT
1	Support S1uData, not support UPCIoT
2	Supports but does not optimize UPCIoT (CP mode is preferred for PDN services that can use both CP and up).
3	Supports and optimizes UPCIoT (preferred up method for PDN business that can use both CP and UP).
<b>Note:</b> About 2 and 3 is the preference for Upciot, which affects: <ul style="list-style-type: none"> <li>– The EMM indicates prefer in the Additionupdatetypeie which way;</li> <li>– for the PDN business where CP and up can be used, RABM takes precedence over which way</li> </ul>	

AT+CFGCOT	
Parameter Description	
<erwopdn> Integer type; configure whether the ERwoPDN is supported and preferred.	
0	Not support ERwoPDN
1	Supports but does not optimize ERwoPDN (attach process necessarily carries PDN)
2	Support and optimize ERwoPDN (when attach process can not carry PDN, do not carry PDN);
<sms_wocomb_att> Integer type; configure whether the SmsWithoutCombinedAttach is supported.	
0	Not support SmsWithoutCombinedAttach
1	Support SmsWithoutCombinedAttach
<apn_rate_control> Integer type; configure whether the ApnRateControl is supported.	
0	Not support ApnRateControl
1	Support ApnRateControl
<epco> Integer type; configure whether the ePCO is supported.	
0	Not support ePCO
1	Support ePCO
Note that for Nbiot, the EPCO must be used in accordance with the Protocol, but the actual test found that some vendor protocol versions are older and do not support EPCO, so add the configuration entry.	



## 8.29 AT+CRTDCP Escalate the Finalization Data Through the Control Surface

AT+CRTDCP	
Syntax	
<b>Test Command</b> AT+CRTDCP=?	<b>Possible Returns:</b> +CRTDCP: (list of supported <reporting>s),(range of supported <cid>s),(maximum number of octets of user data indicated by <cpdata_length>) OK +CME ERROR: <err>
<b>Read Command</b> AT+CRTDCP?	<b>Possible Returns:</b> +CRTDCP: <reporting> OK +CME ERROR: <err>
<b>Set Command</b> AT+CRTDCP=[<reporting>]	<b>Possible Returns:</b> +CME ERROR: <err>
Command Description	
<p>The set command is used to enable and disable reporting of data from the network to the MT that is transmitted via the control plane in downlink direction. If reporting is enabled, the MT returns the unsolicited result code</p> <p>+CRTDCP: &lt;cid&gt;,&lt;cpdata_length&gt;,&lt;cpdata&gt; when data is received from the network.</p> <p>Read command returns the current settings.</p> <p>Test command returns supported values as compound values.</p>	
Parameter Description	
<b>&lt;reporting&gt;</b> Integer type; controlling reporting of mobile terminated control plane data events.	
0	Disable reporting of MT control plane data.
1	Enable reporting of MT control plane data by the unsolicited result code +CRTDCP.
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;cpdata_length&gt;</b>	
Integer type; indicates the number of octets of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.	
<b>&lt;cpdata&gt;</b>	
String type; contains the user data container contents (refer 3GPP TS 24.301 [83] subclause 9.9.4.24). When there is no data to transmit, the <cpdata> shall be an empty string (""). This parameter shall not be subject to conventional character conversion as per +CSCS. The coding formats of the user data container and the maximum length of <cpdata> are implementation specific.	

# 9 TCP/IP Commands

## 9.1 AT+MIOPEN Start up TCP or UDP Connection

AT+MIOPEN	
Syntax	
<b>Test Command</b> AT+MIOPEN=?	<b>Possible Returns:</b> +MIOPEN: (list of supported <n>), (list of supported <mode>),(<IP address>),(<port>)
<b>Set Command</b> AT+ MIOPEN =<n>,<mode>, <IP address/ domain name >,<port> [,<timeout>[,<access_mode> [,<keep_alive>[,<context_id> [,<local_port>]]]]]	<b>Possible Returns:</b> <b>If success:</b> OK <n>,<ALREADY CONNECT <n>,<CONNECT OK  <b>If failed:</b> +CME ERROR <err> <n>,<CONNECT FAIL
<b>Max Response Time</b>	75s
Command Description	
This command allows establishment of a TCP/UDP connection.	
Parameter Description	
<b>&lt;n&gt;</b> Integer type	
0..5	A numeric parameter which indicates the connection number.
<b>&lt;mode&gt;</b> String type; a string parameter which indicates the connection type.	
"TCP"	Establish a TCP connection
"UDP"	Establish a UDP connection
<b>&lt;IP address&gt;</b>	
String type; a string parameter which indicates remote server IP address.	
<b>&lt;port&gt;</b>	
Integer type; remote server port.	
<b>&lt;timeout&gt;</b>	
Integer type; an integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	
<b>&lt;context_id&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).	

AT+MIOPEN	
Parameter Description	
<keepalive> Integer type	
0	Disable TCP keep alive mechanism
1	Enable TCP keep alive mechanism
<access_mode> Integer type	
0	Normal mode
1	Transparent mode
2	Cache mode
<local_port>	
Integer type; local port.	
<domain name>	
String type; a string parameter which indicates remote server domain name	
Remark	
<ul style="list-style-type: none"> <li>– This command allows establishment of a TCP/UDP connection only when the state is IP INITIAL or IP STATUS. So it is necessary to process "AT+CIPSHUT" before user establishes a TCP/UDP connection with this command when the state is not IP INITIAL or IP STATUS.</li> <li>– Before this command is executed, it is necessary to process "AT+CSTT, AT+CIICR, AT+CIFSR", if cid is designated, it is necessary to process "AT+CGDCONT, AT+CGACT" to define the cid.</li> <li>– When access_mode set to 1(transparent mode), n(connect_id) must be 0 and no TCP/UDP connection has already been established.</li> </ul>	
Example	
<b>AT+MIOPEN=1,"TCP"," 114.116.144.151",2042</b> OK CONNECT OK <b>AT+ MIOPEN =?</b> +MIOPEN:(0-7),("TCP","UDP"),(("0-255).(0-255).(0-255).(0-255)","(0-65535),(0-65535),(0-2),(0-1),(0-7),(0-65535) OK	

## 9.2 AT+MIPSEND Send Data Through TCP or UDP Connection

AT+CIPSEND	
Syntax	
<b>Test Command</b> AT+MIPSEND=?	<b>Possible Returns:</b> +MIPSEND: <0-5>[,<send_length>,<timeout>]] OK
<b>Read Command</b> AT+MIPSEND?	<b>Possible Returns:</b> + MIPSEND: <n>, <size> ... OK
<b>Set Command</b> AT+MIPSEND=<n>[,<length> [,<timeout>]]	<b>Possible Returns:</b> <b>If success:</b> +MIPSEND: <SPACE> <connect_id>,<result>[,<len>] <b>If failed:</b> +CME ERROR <err>
Command Description	
The data length which can be sent depends on network status. Set the time that send data automatically with the Command of AT+CIPATS. Only send data at the status of established connection. When +CIPQSEND=0 and the remote server no response, after 645 seconds, CLOSE will be reported.	
Parameter Description	
<b>&lt;n&gt;</b> Integer type	
0..5	A numeric parameter which indicates the connection number
<b>&lt;length&gt;</b>	
Integer type; a numeric parameter which indicates the length of sending data, it must be less than <size>	
<b>&lt;timeout&gt;</b>	
Integer type; an integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request	
Remark	
Ctrl-Z is used as a termination symbol. ESC is used to cancel sending data. There are at most <size> bytes which can be sent at a time.	
Example	
<b>AT+MIPSEND=1,10</b> >abcdefghij SEND OK	

## 9.3 AT+CIPQSEND Select Data Transmitting Mode

AT+CIPQSEND	
Syntax	
<b>Test Command</b> AT+CIPQSEND=?	<b>Possible Returns:</b> +CIPQSEND:(0,1) OK
<b>Read Command</b> AT+CIPQSEND?	<b>Possible Returns:</b> +CIPQSEND:<n> OK
<b>Set Command</b> AT+CIPQSEND=<n>	<b>Possible Returns:</b> OK
Command Description	
This command is used to select data send mode.	
Parameter Description	
<n> Integer type	
Transmitting Mode:	
0	Normal mode – when the server receives TCP data, it will response SEND OK.
1	Quick send mode – when the data is sent to module, it will response DATA ACCEPT:<n>, <length>.
Example	
<b>AT+CIPQSEND=0</b> OK <b>AT+CIPQSEND?</b> +CIPQSEND:0 OK <b>AT+CIPQSEND=?</b> +CIPQSEND:(0,1) OK	

## 9.4 AT+MIPSACK Query Previous Connection Data Transmitting State

AT+CIPACK	
Syntax	
<b>Test Command</b> AT+MIPSACK=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+MIPSACK=<n>	<b>Possible Returns:</b> +MIPSACK:<txlen>,<acklen>,<nacklen> OK
Command Description	
This command is used to query the data amount which has been sent, confirmed etc.	
Parameter Description	
<n>	
Integer type; a numeric parameter which indicates the connection number.	
<txlen>	
Integer type; the data amount which has been sent.	
<acklen>	
Integer type; the data amount confirmed successfully by the server.	
<nacklen>	
Integer type; the data amount without confirmation by the server.	
Example	
<b>AT+MIPSACK=1</b> +MIPSACK:0,0,0 OK	

## 9.5 AT+MIPCLOSE Close TCP or UDP Connection

AT+CIPCLOSE	
Syntax	
<b>Test Command</b> AT+MIPCLOSE=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+MIPCLOSE=<id>[,<timeout>]	<b>Possible Returns:</b> <id>,CLOSE OK
Command Description	
AT+MIPCLOSE only closes connection at corresponding status of TCP/UDP stack. To see the status use AT+CIPSTATUS command. Status should be:TCP CONNECTING,UDP CONNECTING, SERVER LISTENING or CONNECT OK in single-connection mode (see <state> parameter); CONNECTING or CONNECTED in multi-connection mode (see <client state>);OPENING or LISTENING in multi-connection mode (see <server state>).Otherwise it will return ERROR".	
Parameter Description	
<id> Integer type	
<b>0..5</b>	A numeric parameter which indicates the connection number
<timeout>	
Integer type; an integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	
Example	
AT+MIPCLOSE=1	
CLOSE OK	

## 9.6 AT+CIPSHUT Disconnect Wireless Connection

AT+CIPSHUT	
Syntax	
<b>Test Command</b> AT+CIPSHUT=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CIPSHUT	<b>Possible Returns:</b> <b>If success:</b> SHUT OK  <b>If failed:</b> +CME ERROR <err>
<b>Max Response Time</b>	65s
Command Description	
This command is used to shutdown wireless connection which has been connected.	
Remark	
If this command is executed in multi-connection mode, all of the IP connection will be shut. User can close gprs pdp context by AT+CIPSHUT. After it is closed, the status is IP INITIAL. If +PDP: DEACT urc is reported which means the gprs is released by the network, then user still needs to execute AT+CIPSHUT command to make PDP context come back to original state.	
Example	
<b>AT+CIPSHUT</b> SHUT OK	



## 9.7 AT+CLPORT Set Local Port

AT+CLPORT	
Syntax	
<b>Test Command</b> AT+CLPORT=?	<b>Possible Returns:</b> +CLPORT:(0-5), ("TCP","UDP"),(0-65535) OK
<b>Execute Command</b> AT+CLPORT	<b>Possible Returns:</b> +CLPORT: 0,<TCP port>,<UDP port> +CLPORT: 1,<TCP port>,<UDP port> +CLPORT: 2,<TCP port>,<UDP port> +CLPORT: 3,<TCP port>,<UDP port> +CLPORT: 4,<TCP port>,<UDP port> +CLPORT: 5,<TCP port>,<UDP port> OK
<b>Set Command</b> AT+CLPORT=<n>,<mode>,<port>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to set local port for tcp/udp connection before connection established.	
Parameter Description	
<n> Integer type	
0..5	A numeric parameter which indicates the connection number
<mode> String type; a string parameter which indicates the connection type.	
"TCP"	TCP local port
"UDP"	UDP local port
<port> Integer type	
0-65535	A numeric parameter which indicates the local port. Default value is 0, a port can be dynamically allocated a port.
Example	
<b>AT+CLPORT=1,"TCP",23400</b> OK <b>AT+CLPORT=?</b> +CLPORT: (0-7), ("TCP","UDP"),(0-65535) OK <b>AT+CLPORT?</b> +CLPORT:TCP:0,23400,UDP:0 +CLPORT:TCP:1,0,UDP:0 +CLPORT:TCP:2,0,UDP:0 +CLPORT:TCP:3,0,UDP:0 +CLPORT:TCP:4,0,UDP:0 +CLPORT:TCP:5,0,UDP:0 OK	

## 9.8 AT+CSTT Start Task and Set APN, User ID, Password

AT+CSTT	
Syntax	
<b>Test Command</b> AT+CSTT=?	<b>Possible Returns:</b> +CSTT:"APN","USER","PWD" OK
<b>Read Command</b> AT+CSTT?	<b>Possible Returns:</b> +CSTT:<apn>,<user name>,<password> OK
<b>Set Command</b> AT+CSTT=<apn>,<user name>,<password>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+CSTT	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to start task and set APN, user ID, password.	
Parameter Description	
<b>&lt;apn&gt;</b>	
String type; a string parameter which indicates the GPRS access point name. The max length is 50 bytes. Default value is "CMNET".	
<b>&lt;user name&gt;</b>	
String type; a string parameter which indicates the GPRS user name. The max length is 20 bytes.	
<b>&lt;password&gt;</b>	
String type; a string parameter which indicates the GPRS password. The max length is 20 bytes.	
Remark	
The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed, the state will be changed to IP START.	
Example	
<b>AT+CSTT?</b> +CSTT:"CMNET","","" OK	

## 9.9 AT+CIICR Bring up Wireless Connection with GPRS

AT+CIICR	
Syntax	
<b>Test Command</b> AT+CIICR=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CIICR	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
<b>Max Response Time</b>	85s
Command Description	
This command is used to bring up GPRS wireless connection.	
Remark	
AT+CIICR only activates moving scene at the status of IP START, after operating this Command is executed, the state will be changed to IP CONFIG. After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respond ERROR.	
Example	
<b>AT+CIICR?</b> OK	

## 9.10 AT+CIFSR Get Local IP Address

AT+CIFSR	
Syntax	
<b>Test Command</b> AT+CIFSR=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+CIFSR	<b>Possible Returns:</b> <IP address> OK
Command Description	
This command is used to get local IP address.	
Parameter Description	
<IP address>	
String type; a string parameter which indicates the IP address assigned from GPRS or CSD.	
Remark	
Only after PDP context is activated, local IP address can be obtained by AT+CIFSR, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be: IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see<state> parameter); IP STATUS, IP PROCESSING in multi-connection mode (see <state>parameter).	
Example	
<b>AT+CIFSR</b> 10.158.216.151 OK	

## 9.11 AT+MIPSTATE Query Current Connection Status

AT+MIPSTATE	
Syntax	
<b>Test Command</b> AT+MIPSTATE=?	<b>Possible Returns:</b> OK
<b>Execute Command</b> AT+MIPSTATE	<b>Possible Returns:</b> <b>If success:</b> OK MIPSTATE: <connect_id>,<TCP/UDP>,<IPaddress>,<port>,<state>,<cid>,<access_mode> ... <b>If failed:</b> ERROR
Command Description	
This command is used to query current TCP/UDP connection status.	
Example	
<b>AT+MIPSTATE</b> OK +MIPSTATE:0,"","","0",INITIAL,0,0 +MIPSTATE:1,"TCP","114.116.144.151","2021",CONNECT OK,2,0 +MIPSTATE:2,"","","0",INITIAL,0,0 +MIPSTATE:3,"TCP","114.116.144.151","2021",CONNECT OK,2,0 +MIPSTATE:4,"","","0",INITIAL,0,0 +MIPSTATE:5,"","","0",INITIAL,0,0	

## 9.12 AT+MDNSCFG Configure Domain Name Server

AT+CDNSCFG	
Syntax	
<b>Test Command</b> AT+MDNSCFG=?	<b>Possible Returns:</b> +MDNSCFG: "server_address1","server_address2" OK
<b>Read Command</b> AT+MDNSCFG?	<b>Possible Returns:</b> DNS1:<pri_dns> DNS2:<sec_dns> OK
<b>Set Command</b> AT+MDNSCFG=<pri_dns> [<sec_dns>]	<b>Possible Returns:</b> OK
Command Description	
This command is used to configure domain name server.	
Parameter Description	
<server_address1>	
String type; a string parameter which indicates the IP address of the primary domain name server. Default value is 0.0.0.0.	
<server_address2>	
String type; a string parameter which indicates the IP address of the secondary domain name server. Default value is 0.0.0.0.	
Example	
<b>AT+MDNSCFG?</b> <b>DNS1:</b> <211.137.64.163> <b>DNS2:</b> <0.0.0.0> OK <b>AT+MDNSCFG=?</b> +MDNSCFG: "server_address1 ","server_address2" OK	

## 9.13 AT+MDNSGIP Query the IP Address of Given Domain Name

AT+MDNSGIP	
Syntax	
<b>Test Command</b> AT+MDNSGIP=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+MDNSGIP=<domain name> [<timeout>]	<b>Possible Returns:</b> <b>If success:</b> OK +MDNSGIP: 0, <domain name>,<IP1>[,<IP2>]  <b>If failed:</b> +MDNSGIP:1,<dns error code>
Command Description	
This command is used to query the IP address of given domain name.	
Parameter Description	
<b>&lt;domain name&gt;</b>	
String type; a string parameter which indicates the domain name	
<b>&lt;timeout&gt;</b>	
Integer type; an integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request	
<b>&lt;IP1&gt;</b>	
String type; a string parameter which indicates the first IP address corresponding to the domain name	
<b>&lt;IP2&gt;</b>	
String type; a string parameter which indicates the second IP address corresponding to the domain name	
<b>&lt;dns error code&gt;</b> Integer type; a numeric parameter which indicates the error code. There are some other error codes as well.	
8	DNS COMMON ERROR
3	NETWORK ERROR
Example	
AT+MDNSGIP="www.baidu.com" +MDNSGIP: 0,"www.baidu.com","112.34.112.42","112.34.112.43" OK	

## 9.14 AT+CIPATS Set Auto Sending Timer

AT+CIPATS	
Syntax	
<b>Test Command</b> AT+CIPATS=?	<b>Possible Returns:</b> +CIPATS:(list of supported <mode>s),(list of supported <time>) OK
<b>Read Command</b> AT+CIPATS?	<b>Possible Returns:</b> +CIPATS: <mode>,<time> OK
<b>Set Command</b> AT+CIPATS= <mode>[,<time>]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to set auto sending timer when module is sending data.	
Parameter Description	
<mode> Integer type; a numeric parameter which indicates whether set timer when module is sending data.	
0	Not set timer when module is sending data
1	Set timer when module is sending data
<time> Integer type	
1..100	A numeric parameter which indicates the seconds after which the data will be sent.
Example	
<b>AT+CIPATS=1,50</b> OK <b>AT+CIPATS=?</b> +CIPATS:(0,1),(1-100) OK	



## 9.15 AT+CIPSPRT Set Prompt of '>' When Module Sends Data

AT+CIPSPRT	
Syntax	
<b>Test Command</b> AT+CIPSPRT=?	<b>Possible Returns:</b> +CIPSPRT:( list of supported <send prompt>) OK
<b>Read Command</b> AT+CIPSPRT?	<b>Possible Returns:</b> +CIPSPRT: <send prompt> OK
<b>Set Command</b> AT+CIPSPRT= <send prompt>	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to set prompt of '>' when module sends data.	
Parameter Description	
<send prompt> Integer type; a numeric parameter which indicates whether to echo prompt '>' after module issues AT+CIPSEND command.	
0	It shows "send ok" but does not prompt echo '>' when sending is successful.
1	It prompts echo '>' and shows "send ok" when sending is successful.
2	It neither prompts echo '>' nor shows "send ok" when sending is successful.
Example	
<b>AT+CIPSPRT=?</b> +CIPSPRT:(0,1,2) OK <b>AT+CIPSPRT=2</b> OK <b>AT+CIPSPRT?</b> +CIPSPRT:2 OK	

## 9.16 AT+CIPCSGP Set CSD or GPRS for Connection Mode

AT+CIPCSGP	
Syntax	
<b>Test Command</b> AT+CIPCSGP=?	<b>Possible Returns:</b> +CIPCSGP: 0-CSD,DIALNUMBER,USER NAME,PASSWORD,RATE(0-3) - - NOT SUPPORT +CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD OK
<b>Read Command</b> AT+CIPCSGP?	<b>Possible Returns:</b> +CIPCSGP: <mode>,<apn>,<user name>,<password>[,<rate>] OK
<b>Set Command</b> AT+CIPCSGP=<mode>[(<apn>,<user name>,<password>),( <dial number>,<user name>,<password>,<rate>)]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to set CSD or GPRS for connection mode.	
Parameter Description	
<mode> Integer type; a numeric parameter which indicates the wireless connection Mode.	
0	Set CSD as wireless connection mode
1	Set GPRS as wireless connection mode
GPRS parameters	
<apn>	
String type; a string parameter which indicates the access point name.	
<user name>	
String type; a string parameter which indicates the user name.	
<password>	
String type; a string parameter which indicates the password.	
<dial number>	
String type; a string parameter which indicates the CSD dial numbers.	
<user name>	
String type; a string parameter which indicates the CSD user name.	
<password>	
String type; a string parameter which indicates the CSD password.	
<rate>	
Integer type; a numeric parameter which indicates the CSD connection rate .0: 2400 1: 4800 2: 9600 3: 14400.	

**AT+CIPCSGP****Example****AT+CIPCSGP=1,"CMNET","", ""**

OK

**AT+CIPCSGP?****+CIPCSGP:1,"CMNET","", ""**

OK

**AT+CIPCSGP=?****+CIPCSGP: 0-CSD,DIALNUMBER,USER NAME,PASSWORD,RATE(0-3) -- NOT SUPPORT****+CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD**

OK



中国移动  
China Mobile

## 9.17 AT+MIPMODE Select TCPIP Application Mode

AT+CIPMODE	
Syntax	
<b>Test Command</b> AT+MIPMODE=?	<b>Possible Returns:</b> +MIPMODE: <connect_id>,(0-NORMAL MODE, 1-TRANSPARENT MODE,2-CACHE MODE) OK
<b>Read Command</b> AT+MIPMODE?	<b>Possible Returns:</b> +MIPMODE: <connect_id>,<mode> ... OK
<b>Set Command</b> AT+MIPMODE= <connect_id> [,<mode>]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to select TCPIP application mode for send or receive data.	
Parameter Description	
<mode> Integer type	
0	Normal mode
1	Transparent mode
2	Cache mode
Remark	
When mode set to 1(transparent mode), n(connect_id) must be 0 and no TCP/UDP connection has already been established.	
Example	
<b>AT+MIPMODE=?</b> +MIPMODE:<connext_id>[,access_mode] (0-NORMAL MODE, 1-TRANSPARENT MODE, 2- CACHE MODE) OK <b>AT+MIPMODE=0,0</b> OK <b>AT+MIPMODE=0</b> +MIPMODE:0,0 OK	

## 9.18 AT+CIPUDPMODE UDP Extended Mode

AT+CIPUDPMODE	
Syntax	
<b>Test Command</b> AT+CIPUDPMODE=?	<b>Possible Returns:</b> +CIPUDPMODE:(0-5),(0-2),(" (0-255).(0-255).(0-255).(0255)"),(1-65535)
<b>Read Command</b> AT+CIPUDPMODE?	<b>Possible Returns:</b> +CIPUDPMODE: 0,<mode>[,<IPaddress>,<Port>] +CIPUDPMODE: 1,<mode>[,<IPaddress>,<Port>] +CIPUDPMODE: 2,<mode>[,<IPaddress>,<Port>] +CIPUDPMODE: 3,<mode>[,<IPaddress>,<Port>] +CIPUDPMODE: 4,<mode>[,<IPaddress>,<Port>] +CIPUDPMODE: 5,<mode>[,<IPaddress>,<Port>] OK
<b>Set Command</b> AT+CIPUDPMODE=<n>,<mode> [,<IPaddress>,<Port>]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Command Description	
This command is used to set UDP extended mode.	
Parameter Description	
<n> Integer type	
0..5	A numeric parameter which indicates the connection number
<mode> Integer type	
0	UDP Normal Mode
1	UDP Extended Mode
2	Set UDP address to be sent
<IPaddress>	
String type; a string parameter which indicates remote IP address.	
<Port>	
Integer type; remote port.	
Example	
<b>AT+CIPUDPMODE=?</b> +CIPUDPMODE: (0-2),(" (0-255).(0-255).(0-255).(0-255)"),(1-65535) OK <b>AT+CIPUDPMODE=1,2,"114.116.144.151",2042</b> OK <b>AT+CIPUDPMODE?</b> +CIPUDPMODE:0,114.116.144.151,2042 OK	

## 9.19 AT+MIPRD Get Data from Network Manually

AT+MIPRD	
Syntax	
<b>Test Command</b> AT+MIPRD=?	<b>Possible Returns:</b> +MIPRD: <connect_id>[,<read_len>]
<b>Set Command</b> AT+MIPRD= <connect_id>, <reqlength>	<b>Possible Returns:</b> OK ....
Command Description	
This command is used to get Data from network manually.	
Parameter Description	
<b>&lt;connect_id&gt;</b>	
Integer type; a numeric parameter which indicates the connection number.	
<b>&lt;reqlength&gt;</b>	
Integer type; requested number of data bytes (1-1460 bytes) to be read	
Remark	
To enable this function, parameter <mode> must be set to 1 before connection	
Example	
<b>AT+ MIPRD=?</b> +MIPRD: <connect_id>[,<read_len>] OK	

## 9.20 AT+CIPSCONT Save TCPIP Application Context

AT+CIPSCONT	
Syntax	
<b>Read Command</b> AT+CIPSCONT?	<b>Possible Returns:</b> +CIPTKA:<mode>,<keepIdle>,<keepInterval>,<keepCount> +CIPSCONT:<mode0> +CIPCSGP:<mode> Gprs Config APN:<apn> Gprs Config UserId:<user name> Gprs Config Password:<password> +CIPHEAD:<mode> +CIPSHOWIP:<mode> +CIPSRIP:<mode> +CIPATS:<mode>,<time> +CIPSPRT:<send prompt>,<not showsendok> +CIPQSEND:<n> +CIPMODE:<mode> +CIPCCFG: <NmRetry>,<WaitTm>,<SendSz>,<esc>,<Rxmode>,<RxSize>,<Rxtimer> +CIPMUX:<n> +CIPDPDP:<mode>,<interval>,<timer> +CIPRXGET:<mode> +CIPRDTIMER:<rdsigtimer>,<rdmuxtimer> OK
<b>Execute Command</b> AT+CIPSCONT	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> ERROR
Command Description	
This command is used to save TCPIP application context.	
Parameter Description	
<mode0> Integer type	
0	Saved, the value from NVRAM
1	Unsaved, the value from RAM

**AT+CIPSCONT****Example****AT+CIPSCONT?**

+CIPTKA: 0,7200,75,9

+CIPSCONT: 1

+CIPCSGP: 1

Gprs Config APN: CMNET

Gprs Config UserId:

Gprs Config Password:

+CIPHEAD: 0

+CIPSHOWTP: 0

+CIPSRIP: 0

+CIPATS: 0,1

+CIPSPRT: 1

+CIPQSEND: 0

+CIPMODE: 0

+CIPCCFG: 5,2,128,1,0,1460,50

+CIPMUX: 0

+CIPDPDP:

+CIPRXGET: 0

+CIPRDTIMER: 2000,3500

OK



## 9.21 AT+CIPRDTIMER Set Remote Delay Timer

AT+CIPRDTIMER	
Syntax	
<b>Test Command</b> AT+CIPRDTIMER=?	<b>Possible Returns:</b> +CIPRDTIMER:(100-4000),(100-7000) OK
<b>Read Command</b> AT+CIPRDTIMER?	<b>Possible Returns:</b> +CIPRDTIMER: <rdsigtimer>,<rdmuxtimer> OK
<b>Set Command</b> AT+CIPRDTIMER=<rdsigtimer>,<rdmuxtimer>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> ERROR
Command Description	
This command is used to set remote delay timer.	
Parameter Description	
<rdsigtimer>	
Integer type; remote delay timer of single connection. Default value is 2000.	
<rdmuxtimer>	
Integer type; remote delay timer of multi-connections. Default value is 3500.	
Example	
<b>AT+CIPRDTIMER=?</b> +CIPRDTIMER: (100-4000),(100-7000) OK <b>AT+CIPRDTIMER?</b> +CIPRDTIMER: <2000>,<3500> OK	

## 9.22 AT+CIPSGTXT Select GPRS PDP Context

AT+CIPSGTXT	
Syntax	
<b>Test Command</b> AT+CIPSGTXT=?	<b>Possible Returns:</b> +CIPSGTXT:(0,1,2) OK
<b>Set Command</b> AT+CIPSGTXT= <mode>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> ERROR
Command Description	
This command is used to select GPRS PDP context.	
Parameter Description	
<mode> Integer type	
0	Select first PDP context
1	Select second PDP context
2	Select WIFI context
Remark	
If select the WIFI context(2), the WIFI must be connect first.	
Example	
<b>AT+CIPSGTXT=?</b> +CIPSGTXT:(0,1,2) OK	

## 9.23 AT+MIPTKA Set TCP Keep-alive Parameters

AT+MIPTKA	
Syntax	
<b>Test Command</b> AT+MIPTKA=?	<b>Possible Returns:</b> +MIPTKA: <cid>,[,<keepalive>,< keeldle>,< keepInterval >,< keepCount >]]] OK
<b>Read Command</b> AT+MIPTKA?	<b>Possible Returns:</b> +MIPTKA: <cid>,[,<keepalive>,< keeldle>,< keepInterval >,< keepCount >]]] ... OK
<b>Set Command</b> AT+MIPTKA=<cid>[,<keepalive>,[<keeldle>,<keepInterval>[,<keepCount>]]]]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> ERROR
Command Description	
This command is used to set Keep-alive Parameters for long connection.	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;keepalive&gt;</b> Integer type; set TCP keepalive option.	
<b>0</b>	Disable TCP keep alive mechanism
<b>1</b>	Enable TCP keep alive mechanism
<b>&lt;keepIdle&gt;</b>	
Integer type; idle time (in second) before TCP send the initial keepalive probe. 30-7200 Default: 7200	
<b>&lt;keepInterval&gt;</b>	
Integer type; interval time (in second) between keepalive probesretransmission.30-600 Default: 75	
<b>&lt;keepCount&gt;</b>	
Integer type; maximum number of keepalive probes to be sent. 1-9 Default: 9	
Example	
<b>AT+MIPTKA?</b> +MIPTKA: <0>,<0>,<7200>,<75>,<9>... OK	

## 9.24 AT+MIPCFG Add Head at the Beginning of a Package Received

AT+MIPCFG	
Syntax	
<b>Test Command</b> AT+MIPCFG=?	<b>Possible Returns:</b> +MIPCFG: <cid>,[,<mode>] OK
<b>Read Command</b> AT+ MIPCFG?	<b>Possible Returns:</b> + MIPCFG: <cid>,<mode> ... OK
<b>Set Command</b> AT+ MIPCFG =<cid>,<mode>	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> ERROR
Command Description	
This command is used to add head at the beginning of a package received.	
Parameter Description	
<b>&lt;cid&gt;</b>	
Integer type; a numeric parameter which specifies a particular PDP context or EPS bearer context definition. The <cid> parameter is local to the TE-MT interface and identifies the PDP or EPS bearer contexts which have been setup via AT command (see the +CGDCONT and +CGDSCONT commands).	
<b>&lt;mode&gt;</b> Integer type; a numeric parameter which indicates whether header is added to the received data or not.	
<b>0</b>	Not add header when package received.
<b>1</b>	Only add connect mode when package received.
<b>2</b>	Add connect mode and server info when package received.
<b>3</b>	Add connect mode, server info and local info when package received.

## 9.25 AT+SNTP Client Time Synchronize with Network Time Server

AT+SNTP													
Syntax													
<b>Test Command</b> AT+SNTP=?	<b>Possible Returns:</b> +SNTP:ntpserver OK												
<b>Set Command</b> AT+SNTP=<IP address>	<b>Possible Returns:</b> <b>If success:</b> OK +SNTP:OK <b>If failed:</b> +SNTP:FAILED												
<b>Set Command</b> AT+SNTP=<domain name>	<b>Possible Returns:</b> <b>If success:</b> OK +SNTP:OK <b>If failed:</b> +SNTP:FAILED												
Command Description													
This command is used to synchronize with network time server.													
Parameter Description													
<b>&lt;IP address&gt;</b>													
String type; a string parameter which indicates the time server IP address													
<b>&lt;domain name&gt;</b>													
String type; a string parameter which indicates the time server domain name													
Remark													
<p>If you want to executed AT+SNTP=?, please use AT+CCLK=&lt;time&gt; to make sure the module time is the zerotime zone.</p> <p>NTP server also requies authorization, so the server list is not guaranteed to be available. If the server can ping,then it basically can provide ntp service.</p> <p>The list of servers from network is as follows:</p> <table> <tr> <td>domain name</td><td>IP address</td></tr> <tr> <td>cn.ntp.org.cn:</td><td>118.24.4.66, 182.92.12.11, 203.107.6.88, 120.25.108.11</td></tr> <tr> <td>hk.ntp.org.cn:</td><td>none</td></tr> <tr> <td>tw.ntp.org.cn:</td><td>none</td></tr> <tr> <td>us.ntp.org.cn:</td><td>none</td></tr> <tr> <td>kr.ntp.org.cn:</td><td>none</td></tr> </table>		domain name	IP address	cn.ntp.org.cn:	118.24.4.66, 182.92.12.11, 203.107.6.88, 120.25.108.11	hk.ntp.org.cn:	none	tw.ntp.org.cn:	none	us.ntp.org.cn:	none	kr.ntp.org.cn:	none
domain name	IP address												
cn.ntp.org.cn:	118.24.4.66, 182.92.12.11, 203.107.6.88, 120.25.108.11												
hk.ntp.org.cn:	none												
tw.ntp.org.cn:	none												
us.ntp.org.cn:	none												
kr.ntp.org.cn:	none												

**AT+SNTP****Example****AT+CCLK?**

+CCLK: "83/06/02,19:02:46+32"

**AT+CCLK="07/10/25,11:33:40+00"**

OK

**AT+CCLK?**

+CCLK: "07/10/25,11:33:41+00"

OK

**AT+SNTP="36.110.97"**

OK

+SNTP: FAILED

**AT+CCLK?**

+CCLK: "07/10/25,11:36:36+00"

OK

**AT+SNTP="time.windows.com"**

OK

+SNTP: OK

**AT+CCLK?**

+CCLK: "19/05/29,02:05:29+00"

OK



## 9.26 Examples of TCP Client

Examples of TCP Client
<b>AT+CSTT="CMNET","", ""</b> OK
<b>AT+CIICR</b> OK
<b>AT+MIOPEN=1,"TCP","111.205.140.139",6800</b> OK 1,CONNECT OK
<b>AT+MIOPEN=2,"UDP","111.205.140.139",7000</b> OK 2,CONNECT OK
<b>AT+MIPSEND=1</b> > Just test 1 `Control+z` 1,SEND OK
<b>AT+MIPSEND=2</b> > Just test 2 `Control+z` 2,SEND OK
<b>AT+MIPCLOSE=1</b> 1,CLOSE OK
<b>AT+MIPCLOSE=2</b> 2,CLOSE OK
<b>AT+CIPSHUT</b> SHUT OK

# 10 HTTP Commands

## 10.1 AT+MHTTPIPINIT Initialize HTTP Service

AT+MHTTPIPINIT	
Syntax	
<b>Test Command</b> AT+MHTTPIPINIT=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTPIPINIT OK <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+MHTTPIPINIT	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Remark	
Before this command executed, it is necessary to process "AT+CGACT". MHTTPIPINIT should first be executed to initialize the HTTP service.	
Example	
<b>AT+MHTTPIINT</b> OK	



## 10.2 AT+MHTTPTERM Terminate HTTP Service

AT+MHTTPTERM	
Syntax	
<b>Test Command</b> AT+MHTTPTERM=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTPTERM OK <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+MHTTPTERM	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
Remark	
Before this command executed, it is necessary to process "AT+MHTTPINIT". MHTTPTERM should last be executed to terminate the HTTP service.	
Example	
<b>AT+MHTTPTERM</b> OK	

## 10.3 AT+MHTTPSET HTTP Set Parameter

AT+MHTTPSET	
Syntax	
<b>Test Command</b> AT+MHTTPSET=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTPSET:<url> OK  <b>If failed:</b> +CME ERROR <err>
<b>Set Command</b> AT+MHTTPSET=<url>	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> +CME ERROR <err>
Parameter Description	
<b>&lt;url&gt;</b> HTTP client URL: "http://server':port'/'path'". "server": FQDN or IPaddress, "port": default value is 80. Refer to "IETF-RFC 2616". "path": path of file or directory, If 'path' is NULL, it's necessary to remain '/' at the end.	
Remark	
Before this command executed, it is necessary to process "AT+MHTTPINIT".	
Example	
AT+MHTTPSET="http://www.baidu.com:80/index.php" OK	

## 10.4 AT+MHTTPGET HTTP Get Request

AT+MHTTPGET	
Syntax	
<b>Test Command</b> AT+MHTTPGET=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTPGET OK  <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+MHTTPGET	<b>Possible Returns:</b> <b>If success:</b> OK +MHTTPGET:<status_code>,<content_length>  <b>If failed:</b> +CME ERROR <err>
Parameter Description	
<status_code>	
HTTP Status Code responded by remote server; its identifier refers to HTTP1.1(RFC2616)	
<content_length>	
HTTP content_length responded by remote server	
Remark	
Before this command executed, it is necessary to process "AT+MHTTPSET".	
Example	
AT+MHTTPSET="http://www.baidu.com:80/index.php" OK AT+MHTTPGET OK +MHTTPGET:200,15632	

## 10.5 AT+MHTTPPOST HTTP Post Request

AT+MHTTPPOST	
Syntax	
<b>Test Command</b> AT+MHTTPPOST=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTPPOST OK  <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+MHTTPPOST	<b>Possible Returns:</b> <b>If success:</b> > <input post data> OK +HTTPPOST:<status_code>,<content_length>  <b>If failed:</b> +CME ERROR <err>
Parameter Description	
<'>'>	
When receive this parameter, you can enter your POST data in send box and send out. When you send out your POST data, you should focus your cursor in receive box and use combination key: "CTRL+Z" to finish this command.	
<status_code>	
HTTP Status Code responded by remote server, its identifier refers to HTTP1.1(RFC2616)	
<content_length>	
HTTP content_length responded by remote server.	
Remark	
Before this command executed, it is necessary to process "AT+MHTTPSET".	
Example	
AT+MHTTPSET="http://www.baidu.com:80/index.php" OK AT+MHTTPPOST > GET http://www.baidu.com/index.php HTTP/1.1 Host: www.baidu.com Connection: keep-alive OK +MHTTPPOST:302,154	

## 10.6 AT+MHTTDPDL HTTP DL Request

AT+MHTTDPDL	
Syntax	
<b>Test Command</b> AT+MHTTDPDL=?	<b>Possible Returns:</b> <b>If success:</b> +MHTTDPDL OK <b>If failed:</b> +CME ERROR <err>
<b>Execute Command</b> AT+MHTTDPDL	<b>Possible Returns:</b> <b>If success:</b> OK +MHTTDPDL:<status_code>,<content_length> <dl content> <b>If failed:</b> +CME ERROR <err>
Parameter Description	
<download content>	
Downloaded web content.	
<status_code>	
HTTP Status Code responded by remote server; its identifier refers to HTTP1.1(RFC2616)	
<content_length>	
HTTP content_length responded by remote server	
Remark	
Before this command executed, it is necessary to process "AT+MHTTTPSET".	
Example	
AT+MHTTTPSET="http://www.baidu.com:80/index.php" OK AT+MHTTDPDL OK +MHTTDPDL:200,15632 <downloaded content>	

## 10.7 Examples of HTTP

Examples of HTTP
<b>AT+CGATT=1</b> OK
<b>AT+CGDCONT=1,"IP","cmnet"</b> OK
<b>AT+CGACT=1,1</b> +CGACT: 1, 1, 10.132.54.105 OK
<b>AT+MHTTPINIT</b> OK
<b>AT+MHTTPSET=?</b> +MHTTPSET:<url> OK
<b>AT+MHTTPSET="http://www.baidu.com:80/index.php"</b> OK
<b>AT+MHTTPGET</b> OK +MHTTPGET:200,15632
<b>AT+MHTTPDL</b> OK +MHTTPDL:200,15632 <downloaded content>
<b>AT+MHTTPTERM</b> OK

# 11 FTP Commands

## 11.1 AT^FTPOPEN Open FTP Connect

AT^FTPOPEN	
Syntax	
<b>Set Command</b> AT^FTPOPEN=<url>, <username>,<password>, <mode>,<tout>,<type>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
<b>Read Command</b> AT^FTPOPEN?	<b>Possible Returns:</b> <b>Get the opened status, if had opened:</b> ^FTPOPEN:1 <b>Get the opened status, if not opened yet:</b> ^FTPOPEN:0
<b>Test Command</b> AT^FTPOPEN=?	<b>Possible Returns:</b> <b>If success:</b> ^FTPOPEN:<url>,<username>,<password>,<mode>,<tout>,<type> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;url&gt;</b>	
String type; server address (ex. "192.168.1.101:21").	
<b>&lt;username&gt;</b>	
String type; the username for FTP authentication.	
<b>&lt;password&gt;</b>	
String type; the password for FTP authentication.	
<b>&lt;mode&gt;</b> Integer type	
0	Active FTP mode
1	Passive FTP mode (only support passive mode)
<b>&lt;tout&gt;</b>	
Integer type; 5~180(s) The device will logout in background when no FTP operation during the "tout".	
<b>&lt;type&gt;</b> Integer type	
0	For ascii session
1	For FTP Binary sessions

**AT^FTPOPEN****Remark**

The commands executed before, must connect to net with "GPRS" or "WIFI"

**Example**

**AT^FTPOPEN="192.168.1.101:21","username","passwd",1,180,0**

OK

**AT^FTPOPEN?**

^FTPOPEN:1

OK

**AT^FTPOPEN=?**

^FTPOPEN:<url>,<username>,<password>,<mode>,<tout>,<type>

OK



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## 11.2 AT^FTPCLOSE Close FTP Connect

AT^FTPCLOSE	
Syntax	
<b>Execute Command</b> AT^FTPCLOSE	<b>Possible Returns:</b> <b>If success:</b> OK "^URCFTP:0"  <b>If failed:</b> +CME ERROR: <err>
Example	
AT^FTPCLOSE OK ^URCFTP:0	



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## 11.3 AT^FTPGETSET Set GET Params

AT^FTPGETSET	
Syntax	
<b>Set Command</b> AT^FTPGETSET= <filename>, [offset, [size]]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
<b>Read Command</b> AT^FTPGETSET?	<b>Possible Returns:</b> <b>If success:</b> ^FTPGETSET:<filename>, <offset>,<size> OK <b>If failed:</b> +CME ERROR: <err>
<b>Test Command</b> AT^FTPGETSET=?	<b>Possible Returns:</b> <b>If success:</b> ^FTPGETSET:<filename>, [offset,[size]] OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;filepath&gt;</b>	
String type; the file with full path in FTP server.	
<b>&lt;offset&gt;</b>	
Integer type; download offset from the file, if this parameter is empty, download from file begin (optional).	
<b>&lt;size&gt;</b>	
Integer type; download length from the file <offset> or begin. if this parameter is empty, download file from<offset> or begin to end (optional).	
Remark	
<ul style="list-style-type: none"> <li>– If run the command AT^FTPGETSET with 1 parameter, then the parameter must be &lt;filepath&gt; value.</li> <li>– If run the command AT^FTPGETSET with 2 parameters, then the parameter must be &lt;filepath&gt; and &lt;offset&gt; value.</li> </ul> You cannot use the command such as AT^FTPGETSET="/file.1M",,256 to skip the second parameter. Instead of you can run the command AT^FTPGETSET with 3 parameters AT^FTPGETSET="/file.1M",0,256.	
Example	
<b>AT^FTPGETSET="/file.1M",1024,256</b> OK <b>AT^FTPGETSET?</b> ^FTPGETSET:"/file.1M",1024,256 OK <b>AT^FTPGETSET=?</b> ^FTPGETSET:<filename>, [offset, [size]] OK	

## 11.4 AT^FTPGET Get File

AT^FTPGET	
Syntax	
<b>Set Command</b> AT^FTPGET=<mode>[,reqlength]	<b>Possible Returns:</b> <b>If success, when "mode = 1":</b> OK ^FTPGET:1,1 ^FTPGET=2,reqlength ... //output data ^FTPGET=2,0  <b>If success, when "mode = 2 &amp; reqlength = 0":</b> OK ^FTPGET=2,0  <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<mode> Integer type	
1	Reqlength is unused, to start the transfer.
2	Reqlength must be 0, to stop the transfer.
<reqlength> Integer type	
When mode is 2, reqlength is 0, stop the transfers.	
Remark	
The info "^FTPGET=2,1440" means received the 1440 bytes data from server. The command "AT^FTPGET=2,0" must be run when data is received now. If the transfers are overrunning this command will return fails.	
Example	
<b>AT^FTPGET=1</b> OK ^FTPGET:1,1 ^FTPGET=2,1440 ... //Output data ^FTPGET=2,1440 ... //Output data ^FTPGET=2,1440 ... //Output data ^FTPGET=2,0 // Finish <b>AT^FTPGET=2,0</b> OK ^FTPGET=2,0 // Finish	

## 11.5 AT^FTPPUTSET Set PUT Params

AT^FTPPUTSET	
Syntax	
<b>Set Command</b> AT^FTPPUTSET=<filename>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
<b>Read Command</b> AT^FTPPUTSET?	<b>Possible Returns:</b> <b>If success:</b> ^FTPPUTSET:<filename> OK <b>If failed:</b> +CME ERROR: <err>
<b>Test Command</b> AT^FTPPUTSET=?	<b>Possible Returns:</b> <b>If success:</b> ^FTPPUTSET:<filename> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;filename&gt;</b>	
String type; the file name with full path will stored in FTP server.	
Example	
<b>AT^FTPPUTSET="/put.txt"</b> OK <b>AT^FTPPUTSET?</b> ^FTPPUTSET:"/put.txt" OK <b>AT^FTPPUTSET=?</b> ^FTPPUTSET:<filename> OK	

## 11.6 AT^FTPPUT Put File

AT^FTPPUT	
Syntax	
<b>Set Command</b> AT^FTPPUT=<mode>[,<reqlength>]	<b>Possible Returns:</b> <b>If success, when "mode = 1":</b> OK ^FTPPUT:1,3072  <b>If success, when "mode = 2 &amp; reqlength != 0":</b> ... //input data OK  <b>If success, when "mode = 2 &amp; reqlength = 0":</b> OK ^FTPPUT:2,0  <b>If failed:</b> +CME ERROR: <err>
<b>Test Command</b> AT^FTPPUT=?	<b>Possible Returns:</b> <b>If success:</b> ^FTPPUT: mode[,<reqlength>] OK  <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<mode> Integer type	
1	Start trans file (if mode is 1, reqlength is unused)
2	Transfer data
<reqlength>	
Integer type; request length of data bytes to be transmitted, if reqlength is 0, stop transfer.	
Remark	
<ul style="list-style-type: none"> <li>– The command "AT^FTPPUT=2,10" means there are 10 bytes data will upload to server.</li> <li>– When "AT^FTPPUT=2,10" running successfully, user can't input bytes data more than 10.</li> </ul> The command "AT^FTPPUT=2,0" must be run when data is transmitted now. If the transfers are over, running this command will return fails.	

**AT^FTPPUT****Example**

```
AT^FTPPUT=1                //Start transfer
OK
^FTPPUT:1,3072
AT^FTPPUT=2,10              // Input data, size is 10
...
OK
AT^FTPPUT=2,0               //Transfer finish confirm
OK
^FTPPUT:2,0
AT^FTPPUT=?
^FTPPUT: mode[,<reqlength>]
OK
```



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## 11.7 AT^FTPSIZE Get File Size

AT^FTPSIZE	
Syntax	
<b>Set Command</b> AT^FTPSIZE=<filename>	<b>Possible Returns:</b> <b>If success:</b> ^FTPSIZE:xxx OK  <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<filename>	
String type, the file name with full path which stored in FTP server.	
Example	
AT^FTPSIZE="size.txt" ^FTPSIZE:xxx OK	



# 12 COAP Commands

## 12.1 AT^COAPGET Get the Resource from COAP Server

AT^COAPGET	
Syntax	
<b>Set Command</b> AT^COAPGET= <url>, <cmdline>, [timer]	<b>Possible Returns:</b> <b>If success:</b> <resource length>,<contents> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;url&gt;</b>	
A string parameter which is the address of the resource, usually the url includes uri-host, uri-port, uri-path and uri- query.	
<b>&lt;cmdline&gt;</b>	
A string parameter which includes many optional parameters, each optional parameter must be followed by an optional tag.	
<b>[timer]</b>	
An integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	
<b>[data]</b>	
<b>0</b>	No need data input
<b>1</b>	Need input data (default value)
Remark	
If [timer] is not set, the max response time 90 seconds.	
If [timer] is set, the max response time [timer]+5 seconds.	
GPRS or WIFI must be connected before AT+COAPGET executed.	



## 12.2 AT^COAPPUT Update the Resource from COAP Server

AT^COAPPUT	
Syntax	
<b>Set Command</b> AT^COAPPUT=<url>,<cmdline>, [timer],[data]	<b>Possible Returns:</b> <b>If success:</b> <resource length>,<contents> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;url&gt;</b>	
A string parameter which is the address of the resource, usually the url includes uri-host, uri-port, uri-path and uri- query.	
<b>&lt;cmdline&gt;</b>	
A string parameter which includes many optional parameters, each optional parameter must be followed by an optional tag.	
<b>[timer]</b>	
An integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	
<b>[data]</b>	
<b>0</b>	No need data input
<b>1</b>	Need input data (default value)
Remark	
Max Response Time If [timer] is not set, the max response time 90 seconds. If [timer] is set, the max response time [timer]+5 seconds. Before executed COAPPUT needs GPRS or WIFI connect and data input, use AT^COAPDATA prepare the input resource data.	

## 12.3 AT^COAPPOST Create the Resource on the Server

AT^COAPPOST	
Syntax	
<b>Set Command</b> AT^COAPPOST=<url>,<cmdline>, [timer],[data]	<b>Possible Returns:</b> <b>If success:</b> <resource length>,<post contents> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;url&gt;</b>	
A string parameter which is the address of the resource, usually the url includes uri-host, uri-port, uri-path and uri- query.	
<b>&lt;cmdline&gt;</b>	
A string parameter which includes many optional parameters, each optional parameter must be followed by an optional tag.	
<b>[timer]</b>	
An integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	
<b>[data]</b>	
0	No need data input
1	Need input data (default value)

## 12.4 AT^COAPDELETE Delete the Resource on the Server

AT^COAPDELETE	
Syntax	
<b>Set Command</b> AT^COAPDELETE= <url>, <cmdline>,[timer]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<b>&lt;url&gt;</b>	
A string parameter which is the address of the resource, usually the url includes uri-host, uri-port, uri-path and uri- query.	
<b>&lt;cmdline&gt;</b>	
A string parameter which includes many optional parameters, each optional parameter must be followed by an optional tag.	
<b>[timer]</b>	
An integer parameter which indicates the execution cycle of the request, and if timeout request must be terminated and clear the request.	

## 12.5 AT^COAPDATA Input the Data from Serial Port or Sscom Tool

AT^COAPDATA	
Syntax	
<b>Set Command</b> AT^COAPDATA=<length>[,timer]	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
<b>Test Command</b> AT^COAPDATA=?	<b>Possible Returns:</b> +COAPDATA:<1-65535>[, [0-120]] OK
Parameter Description	
<b>&lt;length&gt;</b>	
1 to 65535 The data length of input.	
<b>[timer]</b>	
Timer is the data input cycle, if timeout data input must be terminated. The <length> is input data already.	
Remark	
Max Response Time If [timer] is not set, the max response time 90 seconds. If [timer] is set, the max response time [timer]+5 seconds. If auto input end with resource or length or timer, if manual end with ctrl+z	

## 12.6 AT^COAPREG Configuration Data Register to the Server

AT^COAPREG	
Syntax	
<b>Set Command</b> AT^COAPREG= <reset>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR: <err>
Parameter Description	
<reset>	
0	ICCID saved in NV item without updated.
1	Update the ICCID saved in NV item.
Remark	
GPRS or WIFI must be connected before AT^COAPREG executed.	



## 12.7 Examples of COAP Client

Examples of COAP client
<b>AT+CGATT=1</b> +CGATT:1 OK
<b>AT+CGDCONT=1,"IP","cmnet"</b> OK
<b>AT+CGACT=1,1</b> OK
<b>AT^COAPGET="coap://californium.eclipse.org:5683/", "-p 5683"</b> +COAP(448): ***** CoAP RFC 7252 Cf 2.0.0-SNAPSHOT ***** This server is using the Eclipse Californium (Cf) CoAP framework published under EPL+EDL: <a href="http://www.eclipse.org/californium/(c) 2014, 2015, 2016 Institute for Pervasive Computing, ETH Zurich and others">http://www.eclipse.org/californium/(c) 2014, 2015, 2016 Institute for Pervasive Computing, ETH Zurich and others</a> ***** OK
<b>AT^COAPDATA=11</b> testforpost OK
<b>AT^COAPPOST="coap://californium.eclipse.org:5683/large-post", "-t text/plain -p 5683",20,1</b> +COAP(11):TESTFORPOST OK
<b>AT^COAPDELETE="coap://californium.eclipse.org:5683/obs", "-p 5683",20</b> OK
<b>AT^COAPDATA=10</b> testforput OK
<b>AT^COAPPUT="coap://californium.eclipse.org:5683/large-update", "-t text/plain -p 5683",20,1</b> OK

# 13 Filesystem Commands

## 13.1 AT+FSDWNFILE Write File

AT+FSDWNFILE	
Syntax	
<b>Set Command</b> AT+FSDWNFILE=<filename>, <size>,<text>	<b>Possible Returns:</b> OK
<b>Test Command</b> AT+FSDWNFILE=?	<b>Possible Returns:</b> +FSDWNFILE: filename,size[,tag] OK
Command Description	
<p>Stores(writes) a file into the file system. The stream of bytes can be entered after the &gt; prompt has been provided to the user. The file transfer is terminated exactly when &lt;size&gt; bytes have been sent entered and either "OK" final result code or an error result code is returned. The feed process cannot be interrupted i.e the command mode is re-entered once the user has provided the declared the number of bytes. In implementation, &lt;size&gt; is limited to AT_CMD_LINE_BUFF_LEN (5KB by default). When &lt;size&gt; is larger than AT_CMD_LINE_BUFF_LEN, it will return error.</p>	
Parameter Description	
<b>&lt;filename&gt;</b>	
File's name. It is an utf-8 string, and file name length must smaller than <specificfs>_FILE_NAME_MAX(mostly default 64 bytes).	
<b>&lt;size&gt;</b>	
File size expressed in bytes, must larger than zero, and smaller than min(AT_CMD_LINE_BUFF_LEN,file system size).	
<b>&lt;text&gt;</b>	
Stream of bytes	
Example	
<b>AT+FSDWNFILE="test",10</b> > 1234567890 OK	

## 13.2 AT+FSLSTFILE List Files Information

AT+FSLSTFILE	
Syntax	
<b>Test Command</b> AT+FSLSTFILE=?	<b>Possible Returns:</b> OK
<b>Set Command</b> AT+FSLSTFILE= <filename>	<b>Possible Returns:</b> +FSLSTFILE:[ <filename1> [, <size> ]] OK
<b>Set Command</b> AT+FSLSTFILE= <dir>	<b>Possible Returns:</b> +FSLSTFILE:[ <subdir> ] +FSLSTFILE:[ <filename1> [, <size1> ]] +FSLSTFILE:[ <filename2> [, <size2> ]] OK
Command Description	
List the files and directory of a directory or a file. Just like shell command.	
Parameter Description	
<b>&lt;filename&gt;</b>	
The file name	
<b>&lt;dir&gt;</b>	
The directory name	
<b>&lt;size&gt;</b>	
The file size in byte	
Example	
<b>AT+FSLSTFILE="modemnvm/rf_nv.bin"</b> +FSLSTFILE: "modemnvm/rf_nv.bin", 1234 OK	
<b>AT+FSLSTFILE="/"</b> +FSLSTFILE: "/modemnvm" +FSLSTFILE: "/nvm" +FSLSTFILE: "/fota" OK	
<b>AT+FSLSTFILE="/modemnvm"</b> +FSLSTFILE: "modemnvm/rf_nv.bin", 1234 +FSLSTFILE: "modemnvm/static_nv_2.bin", 2351 OK	



## 13.3 AT+FSRDFILE Read File

AT+FSRDFILE	
Syntax	
<b>Set Command</b> AT+FSRDFILE=<filename>	<b>Possible Returns:</b> +FSRDFILE:<filename>,<size>,<data> OK
<b>Test Command</b> AT+FSRDFILE=?	<b>Possible Returns:</b> +FSRDFILE: file_name[,tag] OK
Command Description	
Retrieves a file from the file system. When the file size is larger than AT_CMD_LINE_BUFF_LEN, only the file name and size will be output, and the file data will be ignored.	
Parameter Description	
<b>&lt;filename&gt;</b>	
File name	
<b>&lt;data&gt;</b>	
File content	
<b>&lt;size&gt;</b>	
File size, in bytes	
Example	
<b>AT+FSRDFILE="test"</b> +FSRDFILE: test,10,1234567890 OK <b>AT+FSRDFILE="test2"</b> +FSRDFILE: test2,100000, OK	

## 13.4 AT+FSRDBLOCK Partial Read File

AT+FSRDBLOCK	
Syntax	
<b>Set Command</b> AT+FSRDBLOCK=<filename>,<offset>,<size>	<b>Possible Returns:</b> +FSRDBLOCK:<filename>,<size>,<data> OK
<b>Test Command</b> AT+FSRDBLOCK=?	<b>Possible Returns:</b> +FSRDBLOCK: filename,offset,size[,tag] OK
Command Description	
Retrieves a file from the file system. this command allows the user to read only a portion of the file. <size> should be larger than zero, and smaller than AT_CMD_LINE_BUFF_LEN. When <offset> is larger than or equal to file size, it will return error. The returned <size> is the real data size. It may be less than the <size> in parameter.	
Parameter Description	
<b>&lt;filename&gt;</b>	
File name	
<b>&lt;offset&gt;</b>	
Offset in bytes from the beginning of the file.	
<b>&lt;size&gt;</b>	
Number of bytes to be read starting from the <offset>.	
<b>&lt;data&gt;</b>	
Content of the file read	
Example	
<b>AT+FSRDBLOCK="test",5,5</b> +FSRDBLOCK: test,5,67890 OK	

## 13.5 AT+FSDELFILE Delete File

AT+FSDELFILE	
Syntax	
<b>Set Command</b> AT+FSDELFILE=<filename>	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> +CME ERROR <err>
<b>Test Command</b> AT+FSDELFILE=?	<b>Possible Returns:</b> +FSDELFILE: filename[,tag] OK
Command Description	
Deletes a stored file from the file system.	
Parameter Description	
<filename>	
File name	
Example	
AT+FSDELFILE="test"	
OK	

## 13.6 AT+FSMKDIR Create Directory

AT+FSMKDIR	
Syntax	
<b>Set Command</b> AT+FSMKDIR=<dirname>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
<b>Test Command</b> AT+FSMKDIR=?	<b>Possible Returns:</b> OK
Command Description	
Create a directory on file system.	
Parameter Description	
<dirname>	
Directory name	
Example	
AT+FSMKDIR="dir" OK	

## 13.7 AT+FSRMDIR Remove Directory

AT+FSRMDIR	
Syntax	
<b>Set Command</b> AT+FSRMDIR=<dirname>	<b>Possible Returns:</b> <b>If success:</b> OK  <b>If failed:</b> +CME ERROR <err>
<b>Test Command</b> AT+FSRMDIR=?	<b>Possible Returns:</b> OK
Command Description	
Remove an empty directory on file system.	
Parameter Description	
<dirname>	
Directory name	
Example	
AT+FSRMDIR="dir"	
OK	

## 13.8 AT+FSLSTPART List Partition Information

AT+FSLSTPART	
Syntax	
<b>Execute Command</b> AT+FSLSTPART	<b>Possible Returns:</b> +FSLSTPART: <mount_point>,<available_size> +FSLSTPART: <mount_point>,<available_size> OK
<b>Test Command</b> AT+FSLSTPART=?	<b>Possible Returns:</b> OK
Command Description	
List all partition, and available size in bytes of each partition.	
Parameter Description	
<mount_point>	
Partition mount point	
<available_size>	
Partition available size in bytes	
Example	
<b>AT+FSLSTPART</b> +FSLSTPART: "/",100 +FSLSTPART: "/factory",200 OK	

## 13.9 AT+FSREMOUNT Remount Partition

AT+FSREMOUNT	
Syntax	
<b>Set Command</b> AT+FSREMOUNT=<mount_point>, <mount_flags>	<b>Possible Returns:</b> <b>If success:</b> OK <b>If failed:</b> +CME ERROR <err>
<b>Test Command</b> AT+FSREMOUNT=?	<b>Possible Returns:</b> OK
Command Description	
Remount Partition.	
Parameter Description	
<mount_point>	
Partition mount point	
<mount_flags>	
0	Mount as read-write.
1	Mount as read-only.
Example	
AT+FSREMOUNT="/factory",0 OK AT+FSREMOUNT="/factory",1 OK	

# 14 Extended Commands

## 14.1 AT+CMVERSION Query Software Internal Versions

AT+CMVERSION	
Syntax	
<b>Execute Command</b> AT+CMVERSION	<b>Possible Returns:</b> < software versions > < supported functions > .... < compilation date > OK
Command Description	
Query software internal versions information.	
Parameter Description	
<software versions>	
String type; query software version.	
<supported functions>	
String type; list the features supported by the software.	
<compilation date>	
String type; date the software version was compiled.	
Example	
<b>AT+CMVERSION</b> CMIOT_ML302_H0S0 HTTP_SUPPORT LBS_SUPPORT ONENET_SUPPORT FS_SUPPORT MQTT_SUPPORT RELEASE_VERSION 20190828_111004 OK	



## 14.2 AT+CMGPIO Configure IO Port Output

AT+CMGPIO	
Syntax	
<b>Test Command</b> AT+CMGPIO=?	<b>Possible Returns:</b> +CMGPIO: (list of supported <id>s), (list of supported <value>s)
<b>Set Command</b> AT+CMGPIO= <id>,<value>	<b>Possible Returns:</b> OK
Command Description	
Configure the reserved IO port output level.	
Parameter Description	
<id> Integer type; IO port.	
1~5	GPIO1 ~ GPIO5
<value> Integer type; output level.	
0	Low level (0V)
1	High level (1.8V)
Example	
AT+CMGPIO=1,1 OK AT+CMGPIO=1,0 OK	

## 14.3 AT+CMNETLED Configure Network LED

AT+CMNETLED	
Syntax	
<b>Test Command</b> AT+CMNETLED=?	<b>Possible Returns:</b> +CMNETLED: (list of supported <value>s)
<b>Set Command</b> AT+CMNETLED= <value>	<b>Possible Returns:</b> OK
Command Description	
Configure network LED, indicating network state.	
Parameter Description	
<value> Integer type	
0	Close
1	Open
Example	
AT+CMNETLED=1	
OK	



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## 14.4 AT+CMADC ADC Voltage Acquisition

AT+CMADC	
Syntax	
<b>Test Command</b> AT+CMADC=?	<b>Possible Returns:</b> +CMADC: (list of supported<channel>s)
<b>Set Command</b> AT+CMADC=<channel>	<b>Possible Returns:</b> +CMADC: <voltage> OK
Command Description	
ADC Voltage Acquisition.	
Parameter Description	
<channel> Integer type; the ADC channel where the voltage is to be collected.	
1	ADC1
2	ADC2
<voltage>	
Integer type; the ADC channel where the voltage is to be collected. The range is 0 ~ 1800mV.	
Example	
<b>AT+CMADC=1</b> +CMADC: 1782mV OK	

## 14.5 AT+LBSKEY Set Base Station Location Secret Key

AT+LBSKEY	
Syntax	
<b>Read Command</b> AT+LBSKEY?	<b>Possible Returns:</b> +LBSKEY: <key> OK
<b>Set Command</b> AT+LBSKEY= <key>	<b>Possible Returns:</b> OK
Command Description	
This command is used to set the secret key required for the base station location. The module adopts the autonavi platform to obtain the base station location data, so the user needs to apply Own autonavi account, and get the corresponding secret key.	
Parameter Description	
<b>&lt;key&gt;</b>	
Integer type; base station location secret key (Max length: 100 bytes).	
Remark	
Users should apply for autonavi account by themselves and use their own key. The key applied by our company is built into the module, which can be used for user function development trial, but the key of our company cannot be directly used. Simple key acquisition process: 1. Apply for autonavi enterprise developer account; 2. Click personal center -> application management -> to create an application; 3. Click "add new key" on the application page, select intelligent hardware on the service platform, and there is no IP whitelist; After submission, the key can be obtained.	

## 14.6 AT+QCELLLOC Obtain Base Station Location

AT+QCELLLOC	
Syntax	
<b>Execute Command</b> AT+QCELLLOC	<b>Possible Returns:</b> +QCELLLOC: <longitude>,<latitude> OK
Command Description	
This command is used to obtain base station location data.	
Parameter Description	
<b>&lt;longitude&gt;</b>	
Integer type; the longitude information.	
<b>&lt;latitude&gt;</b>	
Integer type; the latitude information.	
Remark	
Activate the network before obtaining the location. Before using this command, set the location key using AT+LBSKEY.	
Example	
<b>AT+CGACT=1</b> OK <b>AT+QCELLLOC</b> +QCELLLOC: 106.5022255,29.6174498 OK	

# 15 Summary of Error Code

## 15.1 Code of CME ERROR Meaning

Code	Meaning
0	PHONE_FAILURE
1	NO_CONNECT_PHONE
2	PHONE_ADAPTER_LINK_RESERVED
3	OPERATION_NOT_ALLOWED
4	OPERATION_NOT_SUPPORTED
5	PHSIM_PIN_REQUIRED
6	PHFSIM_PIN_REQUIRED
7	PHFSIM_PUK_REQUIRED
10	SIM_NOT_INSERTED
11	SIM_PIN_REQUIRED
12	SIM_PUK_REQUIRED
13	SIM_FAILURE
14	SIM_BUSY
15	SIM_WRONG
16	INCORRECT_PASSWORD
17	SIM_PIN2_REQUIRED
18	SIM_PUK2_REQUIRED
20	MEMORY_FULL
21	INVALID_INDEX
22	NOT_FOUND
23	MEMORY_FAILURE
24	TEXT_LONG
25	INVALID_CHAR_INTEXT
26	DAIL_STR_LONG
27	INVALID_CHAR_INDIAL
30	NO_NET_SERVICE
31	NETWORK_TIMEOUT
32	NOT_ALLOW_EMERGENCY
40	NET_PER_PIN_REQUIRED
41	NET_PER_PUK_REQUIRED
42	NET_SUB_PER_PIN_REQ

Code	Meaning
43	NET_SUB_PER_PUK_REQ
44	SERVICE_PROV_PER_PIN_REQ
45	SERVICE_PROV_PER_PUK_REQ
46	CORPORATE_PER_PIN_REQ
47	CORPORATE_PER_PUK_REQ
48	PHSIM_PBK_REQUIRED
49	EXE_NOT_SURPORT
50	EXE_FAIL
49	NO_MEMORY
50	OPTION_NOT_SURPORT
51	PARAM_INVALID
52	EXT_REG_NOT_EXIT
53	EXT_SMS_NOT_EXIT
54	EXT_PBK_NOT_EXIT
55	EXT_FFS_NOT_EXIT
103	GPRS_ILLEGAL_MS_3
106	GPRS_ILLEGAL_MS_6
107	GPRS_SVR_NOT_ALLOWED
111	GPRS_PLMN_NOT_ALLOWED
112	GPRS_LOCATION_AREA_NOT_ALLOWED
113	GPRS_ROAMING_NOT_ALLOWED
132	GPRS_OPTION_NOT_SUPPORTED
133	GPRS OPTION NOT SUBSCRIBED
134	GPRS OPTION TEMP ORDER OUT
149	GPRS PDP AUTHENTICATION FAILURE
150	GPRS INVALID MOBILE CLASS
148	GPRS UNSPECIFIED GPRS ERROR
264	SIM VERIFY FAIL
265	SIM UNBLOCK FAIL
266	SIM CONDITION NO FULLILLED
267	SIM UNBLOCK FAIL NO LEFT
268	SIM VERIFY FAIL NO LEFT
269	SIM INVALID PARAMETER
270	SIM UNKNOW COMMAND
271	SIM_WRONG_CLASS
272	SIM_TECHNICAL_PROBLEM
273	SIM_CHV_NEED_UNBLOCK
274	SIM_NOEF_SELECTED
275	SIM_FILE_UNMATCH_COMMAND
276	SIM_CONTRADICTION_CHV

Code	Meaning
277	SIM_CONTRADICTION_INVALIDATION
278	SIM_MAXVALUE_REACHED
279	SIM_PATTERN_NOT_FOUND
280	SIM_FILEID_NOT_FOUND
281	SIM_STK_BUSY
282	SIM_UNKNOW
283	SIM_PROFILE_ERROR



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## 15.2 Code of CMS ERROR Meaning

Code	Meaning
1	UNASSIGNED_NUM
8	OPER_DETERM_BARR 10 CALL_BARRED
21	SM_TRANS_REJE
27	DEST_OOS
28	UNINDENT_SUB
29	FACILIT_REJE
30	UNKONWN_SUB
38	NW_OOO
41	TMEP_FAIL
42	CONGESTION
47	RES_UNAVAILABLE
50	REQ_FAC_NOT_SUB
69	RFQ_FAC_NOT_IMP
81	INVALID_SM_TRV
95	INVALID_MSG
96	INVALID_MAND_INFO
97	MSG_TYPE_ERROR
98	MSG_NOT_COMP
99	INFO ELEMENT ERROR
111	PROT ERROR
127	IW_UNSPEC
128	TEL IW NOT SUPP
129	SMS TYPE0 NOT SUPP
130	CANNOT REP SMS
143	UNSPEC TP ERROR
144	DCS NOT SUPP
145	MSG CLASS NOT SUPP
159	UNSPEC TD ERROR
160	CMD CANNOT ACT
161	CMD UNSUPP
175	UNSPEC_TC_ERROR
176	TPDU_NOT_SUPP
192	SC_BUSY
193	NO_SC_SUB
194	SC_SYS_FAIL
195	INVALID_SME_ADDR
196	DEST_SME_BARR
197	SM_RD_SM
198	TP_VPF_NOT_SUPP
199	TP_VP_NOT_SUPP
208	D0_SIM_SMS_STO_FULL
209	NO_SMS_STO_IN_SIM
210	ERR_IN_MS

Code	Meaning
211	MEM_CAP_EXCCEEDED
212	SIM_APP_TK_BUSY
213	SIM_DATA_DL_ERROR
255	UNSPEC_ERRO_CAUSE
300	ME_FAIL
301	SMS_SERVIEC_RESERVED
302	OPER_NOT_ALLOWED
303	OPER_NOT_SUPP
304	INVALID_PDU_PARAM
305	INVALID_TXT_PARAM
310	SIM_NOT_INSERT
311	SIM_PIN_REQUIRED
312	PH_SIM_PIN_REQUIRED
313	SIM_FAIL
314	SIM_BUSY
315	SIM_WRONG
316	SIM_PUK_REQUIRED
317	SIM_PIN2_REQUIRED
318	SIM_PUK2_REQUIRED
320	MEM_FAIL
321	INVALID_MEM_INDEX
322	MEM_FULL
330	SCA_ADDR_UNKNOWN
331	NO_NW_SERVICE
332	NW_TIMEOUT
340	NO_CNMA_ACK_EXPECTED
500	UNKNOWN_ERROR
512	USER_ABORT
513	UNABLE_TO_STORE
514	INVALID_STATUS
515	INVALID_ADDR_CHAR
516	INVALID_LEN
517	INVALID_PDU_CHAR
518	INVALID_PARA
519	INVALID_LEN_OR_CHAR
520	INVALID_TXT_CHAR
512	TIMER_EXPIRED