



SIM7028 Series_ AT Command Manual

LPWA Module

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1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom SIM7028 Series, including SIM7028.

1.2 Related documents

You can visit the SIMCom Website using the following link:

<http://www.simcom.com>

1.3 Conventions and abbreviations

In this document, the GSM engines are referred to as following term:

- ME (Mobile Equipment);
- MS (Mobile Station);
- TA (Terminal Adapter);
- DCE (Data Communication Equipment) or facsimile DCE (FAX modem, FAX board);

In application, controlling device controls the GSM engine by sending AT Command via its serial interface. The controlling device at the other end of the serial line is referred to as following term:

- TE (Terminal Equipment);
- DTE (Data Terminal Equipment) or plainly "the application" which is running on an embedded system;

1.4 AT Command syntax

The "AT" or "at" or "aT" or "At" prefix must be set at the beginning of each Command line. To terminate a Command line enter <CR>.

Commands are usually followed by a response that includes. "<CR><LF><response><CR><LF>"

Throughout this document, only the responses are presented, <CR><LF> are omitted intentionally.

1.4.1 Basic syntax

These AT commands have the format of "AT<x><n>", or "AT&<x><n>", where "<x>" is the Command, and "<n>" is/are the argument(s) for that Command. An example of this is "ATE<n>", which tells the DCE whether received characters should be echoed back to the DTE according to the value of "<n>". "<n>" is optional and a default will be used if missing.

1.4.2 S Parameter syntax

These AT commands have the format of "ATS<n>=<m>", where "<n>" is the index of the **S** register to set, and "<m>" is the value to assign to it. "<m>" is optional; if it is missing, then a default value is assigned.

1.4.3 Extended Syntax

These commands can operate in several modes, as in the following table:

Table 1: Types of AT commands and responses

Test Command AT+<x>=?	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes.
Read Command AT+<x>?	This command returns the currently set value of the parameter or parameters.
Write Command AT+<x>=<...>	This command sets the user-definable parameter values.
Execution Command AT+<x>	The execution command reads non-variable parameters affected by internal processes in the GSM engine.

1.4.4 Combining AT commands on the same Command line

You can enter several AT commands on the same line. In this case, you do not need to type the "AT" or "at" prefix before every command. Instead, you only need type "AT" or "at" the beginning of the command line. Please note to use a semicolon as the command delimiter after an extended command; in basic syntax or S parameter syntax, the semicolon need not enter, for example:

```
ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.
```

The Command line buffer can accept a maximum of 559 characters(counted from the first command without "AT" or "at" prefix) or 39 AT commands. If the characters entered exceeded this number then none of the Command will executed and TA will return "ERROR".

1.4.5 Entering successive AT commands on separate lines

When you need to enter a series of AT commands on separate lines, please Note that you need to wait the final response (for example OK, CME error, CMS error) of last AT Command you entered before you enter the next AT Command.

1.5 AT Command Responses

When the AT Command processor has finished processing a line it will output either OK, ERROR or an error code indicating that it is ready to accept a new command. Solicited informational responses are sent before the final OK or ERROR. Unsolicited information responses will never occur between a solicited informational response and the final OK or ERROR.

For AT Commands aligned to the 3GPP 27.007 specification error codes are enabled with the CMEE command, else the ERROR message will be returned. For AT Commands aligned to the 3GPP 27.005 specification, a CMS error will be returned where specified.

Responses will be of the format:

```
<CR><LF>+CMD1: <parameters><CR><LF>
```

```
<CR><LF>OK<CR><LF>
```

or

```
<CR><LF><parameters><CR><LF>
```

```
<CR><LF>OK<CR><LF>
```

1.6 AT Command definitions

- <CR> Carriage return character
- <LF> Line feed character
- <.> Parameter name. Angle brackets do not appear on command line
- [..] Option parameter. Square brackets do not appear on the command line.

1.7 3GPP Alignment

3GPP commands are aligned to 3GPP TS 27.007 v14.3.0 (2017-03). For clarification on 3GPP commands, please refer to this document.

1.8 Supported character sets

The SIM7028 Series AT Command interface defaults to the **IRA** character set. The SIM7028 Series supports the following character sets:

- UCS2
- IRA

The character set affects transmission and reception of SMS and SMS Cell Broadcast messages, the entry and display of phone book entries text field and SIM Application Toolkit alpha strings.

1.9 Definitions

1.9.1 Parameter Saving Mode

For the purposes of the present document, the following syntactical definitions apply:

- **NO_SAVE**: The parameter of the current AT command will be lost if module is rebooted or current AT command doesn't have parameter.
- **AUTO_SAVE**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect immediately, and it won't be lost if module is rebooted.

- **AUTO_SAVE_REBOOT:** The parameter of the current AT command will be kept in NVRAM automatically and take in effect after reboot, and it won't be lost if module is rebooted.
- -: "-" means this AT command doesn't care the parameter saving mode.

1.9.2 Max Response Time

Max response time is estimated maximum time to get response, the unit is seconds.

"-" means this AT command doesn't care the response time.

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2 AT Commands According to V.25TER

2.1 Overview of AT Commands According to V.25TER

Command	Description
ATE	Set Command Echo Mode.
ATI	Display Product Identification Information.

2.2 Detailed Description of AT Commands According to V.25TER

2.2.1 ATE Set Command Echo Mode

ATE Set Command Echo Mode	
Execution Command ATE<value>	Response This setting determines whether or not the TA echoes characters received from TE during Command state. OK
Parameter Saving Mode	NO_SAVE
Maximum Response Time	
Reference	V.25ter

Defined Values

<value>	0 Echo mode off
	1 Echo mode on

Example

ATE0

OK

ATE1

OK

AT

OK

2.2.2 ATI Display Product Identification Information

ATIDisplay Product Identification Information

Execution Command ATI	<p>Response TA issues product information text.</p> <p>Example: Manufacturer: SIMCOM INCORPORATED Model: SIM7028 Revision: V1.0.01 IMEI: <imei></p> <p>OK</p>
Parameter Saving Mode	NO_SAVE
Maximum Response Time	-
Reference	V.25ter

Defined Values

<imei>	string type in decimal format indicating the IMEI
--------	---

Example

ATI
Manufacturer: SIMCOM INCORPORATED
Model: SIM7028
Revision: V1.0.01
IMEI: 312345698765387

OK

3 AT Commands According to 3GPP TS 27.007

3.1 Overview of AT Command According to 3GPP TS 27.007

Command	Description
AT+CGMI	Request Manufacturer Identification
AT+CGMM	Request Model Identification
AT+CGMR	Request TA Revision Identification of Software Release
AT+CGSN	Request Product Serial Number Identification
AT+CREG	Network Registration
AT+CEREG	EPS Network Registration Status
AT+CSCON	Signalling connection status
AT+CSQ	Signal Quality Report
AT+CESQ	Get Extended Signal Quality
AT+CGPADDR	Show PDP Address
AT+COPS	Operator Selection
AT+CGATT	Attach or Detach from GPRS Service
AT+CGACT	PDP Context Activate or Deactivate
AT+CIMI	Request International Mobile Subscriber Identity
AT+CGDCONT	Define PDP Context
AT+CFUN	Set Phone Functionality
AT+CMEE	Report Mobile Equipment Error
AT+CCLK	Return current date & time
AT+CPSMS	Power Saving Mode Setting
AT+CEDRXS	Extended-DRX Setting
AT+CEER	Extended Error Report
AT+CEDRXRDP	eDRX Read Dynamic Parameters
AT+CTZR	Time Zone Reporting
AT+CTZU	Automatic Time Zone Update
AT+CIPCA	Initial PDP context activation
AT+CGAPNRC	APN rate control
AT+CSODCP	Sending of originating data via the control plane
AT+CRTDCP	Reporting of terminating data via the control plane
AT+CGEREP	Packet Domain Event Reporting
+CGEV	Indicate EPS PDN Connection and Bearer Resources Operations Status
AT+CGCONTRDP	PDP Context Read Dynamic Parameters

AT+CGAUTH	Define PDP Context Authentication Parameters
AT+CPIN	Enter PIN
AT+CLCK	Facility Lock
AT+CMOLR	Mobile Originated Location Request
AT+CPWD	Change Password
AT+CPINR	Remaining PIN Retries
AT+CCHO	Open Logical Channel
AT+CCHC	Close logical channel
AT+CGLA	Generic UICC Logical Channel Access
AT+CMTLR	Mobile Terminated Location Request Notification
AT+CMTLRA	Mobile Terminated Location Request Disclosure Allowance
AT+CRCES	Reading Coverage Enhancement Status
AT+CRSM	Restricted SIM Access
AT+CSIM	Generic SIM Access
AT+CGDATA	Enter Data State
AT+CCIoTOPT	CloT optimization configuration
AT+CGCMOD	PDP context modify
AT+CGEQOS	Define EPS quality of service
AT+CGEQOSRDP	EPS Quality of Service Read Dynamic Parameters
AT+CGTFT	Traffic flow template
AT+IPR	Set UE Baud Rate

3.2 Detailed Descriptions of AT Command According to 3GPP TS 27.007

3.2.1 AT+CGMI Request Manufacturer Identification

AT+CGMI Request Manufacturer Identification	
Test Command AT+CGMI=?	Response +CGMI: <manufacturer_ID>
Execution Command AT+CGMI	OK
Parameter Saving Mode	Response <manufacturer> OK or +CMEERROR: <err>
Max Response Time	NO_SAVE -

Reference	3GPP TS 27.007 [13]
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Defined Values

<manufacturer_ID>	The ID of manufacturer the total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>
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3.2.2 AT+CGMM Request Model Identification

AT+CGMM Request Model Identification

Test Command AT+CGMM=?	Response +CGMM:<list of supported technologies>,<model> OK
Execution Command AT+CGMM	Response <model> OK If error is related to ME functionality: +CMEERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<model>	Product model identification text the total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>
---------	--

3.2.3 AT+CGMR Request TA Revision Identification of Software Release

AT+CGMR Request TA Revision Identification of Software Release

Test Command AT+CGMR=?	Response OK
Execution Command AT+CGMR	Response This command returns the manufacturer revision. The text is human readable

	<p>and is not intended for microcontroller parsing. By default this will return the firmware revision – release and build. <revision></p> <p>OK If error is related to ME functionality: +CMEERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<revision>	<p>Product software version identification text. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR></p>
-------------------------	--

NOTE

<revision> will change format over time. It should be treated as an opaque identifier.
SECURITY PROTOCOL and APPLICATION is the core version and will update with the firmware version.
RADIO is the specific module calibration parameter, if the module has been calibrated during the production line then we'd better not to change it during the next operation.
SSB second stage bootloader version.

3.2.4 AT+CGSN Request Product Serial Number Identification

AT+CGSN Request Product Serial Number Identification (Identical with +GSN)

<p>Test Command AT+CGSN=?</p>	<p>Response when TE supports <snt> and command successful: +CGSN: (list of supported <snt>s)</p> <p>OK</p>
<p>Execution Command AT+CGSN[=<snt>]</p>	<p>Response when <snt>=0 (or omitted) and command successful: [+CGSN:]<sn> when <snt>=1 and command successful: +CGSN: <imei></p>

	<p>when <snt>=2 and command successful: +CGSN: <imeisv></p> <p>when <snt>=3 and command successful: +CGSN: <svn></p> <p>or +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007 [13]	

Defined Values

<snt>	<p>Integer type indicating the serial number type that has been requested.</p> <p>0 returns <sn></p> <p>1 returns the IMEI (International Mobile station Equipment Identity)</p> <p>2 returns the IMEISV (International Mobile station Equipment Identity and Software Version number)</p> <p>3 returns the SVN (Software Version Number)</p>
<sn>	<p>The 128-bit UUID of the UE. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR></p>
<imei>	<p>string type in decimal format indicating the IMEI</p>
<imeisv>	<p>string type in decimal format indicating the IMEISV</p>
<svn>	<p>string type in decimal format indicating the current SVN which is a part of IMEISV;</p>

3.2.5 AT+CREG Network Registration

AT+CREG Network Registration	
<p>Test Command</p> <p>AT+CREG=?</p>	<p>Response</p> <p>+CREG: (list of supported <n>s)</p> <p>OK</p>
<p>Read Command</p> <p>AT+CREG?</p>	<p>Response</p> <p>+CREG:</p> <p><n>,<stat>[,<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]</p> <p>OK</p>
<p>Write Command</p>	<p>Response</p> <p>OK</p>

AT+CREG=[<n>]	or ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	integer type 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CREG: <stat> 2 enable network registration and location information unsolicited resultcode +CREG: <stat>[,<tac>],[<ci>],[<AcT>]] 3 enable network registration, location information and EMM cause value information unsolicitedresultcode +CREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]]
<stat>	Integer type; indicates the EPS registration status 0 not registered, MT is not currently searching for an operator to register to 1 registered, home network 2 not registered, but MT is currently trying to attach or searching for 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 9 registered for "CSFB not preferred", home network (not applicable) 10 registered for "CSFB not preferred", roaming (not applicable)
<tac>	string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string type; four byte E-UTRAN cell ID in hexadecimal format
<AcT>	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 (not applicable) 4 UTRAN w/HSDPA (not applicable) 5 UTRAN w/HSUPA (not applicable) 6 UTRAN w/HSDPA and HSUPA (not applicable)

	7 E-UTRAN
	8 EC-GSM-IoT (A/Gb mode) (see NOTE 5) (not applicable)
	9 E-UTRAN (NB-S1 mode) (see NOTE 6)
<cause_type>	Integer type; indicates the type of <reject_cause>. 0 Indicates that <reject_cause> contains an EMM cause value 1 Indicates that <reject_cause> contains a manufacturer-specific cause.
<reject_cause>	Integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.

NOTE

Set of <n> will save to NVM, and the default value is 0.

3.2.6 AT+CEREG EPS Network Registration Status

AT+CEREG EPS Network Registration Status	
Test Command AT+CEREG=?	Response +CEREG: (list of supported <n>s) OK
Read Command AT+CEREG?	Response when <n>=0, 1, 2 or 3 and command successful: +CEREG: <n>,<stat>[, [<tac>], [<ci>], [<AcT>], [<cause_type>, <reject_cause>]]] when <n>=4 or 5 and command successful: +CEREG: <n>,<stat>[, [<lac>], [<ci>], [<AcT>], [<rac>], [<cause_type>], [<reject_cause>], [<Active- Time>], [<Periodic-TAU>]]] If error is related to wrong AT syntax or operation not allowed: +CME ERROR: <err>
Write Command AT+CEREG=<n>	Response OK or ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	<p>integer type</p> <p>0 disable network registration unsolicited result code</p> <p>1 enable network registration unsolicited result code +CEREG: <stat></p> <p>2 enable network registration and location information unsolicited resultcode +CEREG: <stat>[,<tac>],[<ci>],[<AcT>]]</p> <p>3 enable network registration, location information and EMM cause value information unsolicitedresultcode +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]]</p> <p>4 For a UE that wants to apply PSM, enable network registration and location information unsolicited resultcode +CEREG: <stat>[,<tac>],[<ci>],[<AcT>][,],[<Active-Time>],[<Periodic-TAU>]]]]</p> <p>5 For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited resultcode +CEREG: <stat>[,<tac>],[<ci>],[<AcT>],[<cause_type>],[<reject_cause>][,],[<Active-Time>],[<Periodic-TAU>]]]]</p>
<stat>	<p>Integer type; indicates the EPS registration status</p> <p>0 not registered, MT is not currently searching for an operator to register to</p> <p>1 registered, home network</p> <p>2 not registered, but MT is currently trying to attach or searching for an operator to register to</p> <p>3 registration denied</p> <p>4 unknown (e.g. out of E-UTRAN coverage)</p> <p>5 registered, roaming</p> <p>6 registered for "SMS only", home network (not applicable)</p> <p>7 registered for "SMS only", roaming (not applicable)</p> <p>8 attached for emergency bearer services only</p> <p>9 registered for "CSFB not preferred", home network (not applicable)</p> <p>10 registered for "CSFB not preferred", roaming (not applicable)</p>
<tac>	<p>string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p>
<ci>	<p>string type; four byte E-UTRAN cell ID in hexadecimal format</p>
<AcT>	<p>integer type; indicates the access technology of the serving cell</p> <p>0 GSM (not applicable)</p> <p>1 GSM Compact (not applicable)</p> <p>2 UTRAN (not applicable)</p> <p>3 GSM w/EGPRS (not applicable)</p> <p>4 UTRAN w/HSDPA (not applicable)</p> <p>5 UTRAN w/HSUPA (not applicable)</p> <p>6 UTRAN w/HSDPA and HSUPA (not applicable)</p>

	<p>7 E-UTRAN</p> <p>8 EC-GSM-IoT (A/Gb mode) (see NOTE 5) (not applicable)</p> <p>9 E-UTRAN (NB-S1 mode) (see NOTE 6)</p>
<cause_type>	<p>Integer type; indicates the type of <reject_cause>.</p> <p>0 Indicates that <reject_cause> contains an EMM cause value</p> <p>1 Indicates that <reject_cause> contains a manufacturer-specific cause.</p>
<reject_cause>	<p>Integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p>
<Active-Time>	<p>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 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401</p>
<Periodic-TAU>	<p>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 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401</p>

NOTE

- NOTE 1: If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.
- NOTE 2: 3GPP TS 24.008 and 3GPP TS 24.301 specify the condition when the MS is considered as attached for emergency bearer services.
- NOTE 3: 3GPP TS 44.060 specifies the System Information messages which give the information about whether the serving cell supports EGPRS.
- NOTE 4: 3GPP TS 25.331 specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
- NOTE 5: 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT.
- NOTE 6: 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN (NB-S1 mode).

3.2.7 AT+CSCON Signalling Connection Status

AT+CSCON Signalling Connection Status

Test Command	Response
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AT+CSCON=?	+CSCON: (list of supported<n>s) OK
Read Command AT+CSCON?	Response +CSCON: <n>,<mode>[,<state>] OK
Write Command AT+CSCON=<n>	Response Sets which character set <n> are used by the TE. The TA can then convert character strings correctly between the TE and ME character sets. OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<n>	Integer type 0 disable unsolicited result code 1 enable unsolicited result code +CSCON: <mode>
<mode>	Integer type; indicates the signalling connection status 0 idle 1 connected 2-255 <reserved for future use>
<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 1 Indicates usage of radio access of type UTRAN TDD 2 Indicates usage of radio access of type UTRAN FDD 3 Indicates usage of radio access of type E-UTRAN TDD 4 Indicates usage of radio access of type E-UTRAN FDD

3.2.8 AT+CSQ Signal Quality Report

AT+CSQ Signal Quality Report	
Test Command AT+CSQ=?	Response +CSQ: (list of supported <rss>s),(list of supported <ber>s) OK
Execution Command AT+CSQ	Response Execution command returns received signal strength indication <rss> and channel bit error rate <ber> from the MT. +CSQ: <rss>,<ber> OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<rss>	0 -113 dBm or less 1 -111 dBm 2...30 -109... -53 dBm 31 -51 dBm or greater 99 not known or not detectable
<ber>	integer type; channel bit error rate (in percent) 0...7 as RXQUAL values (refer to 3GPP specification) 99 Not known or not detectable

3.2.9 AT+CESQ Get Extended Signal Quality

AT+CESQ Get Extended Signal Quality	
Test Command AT+CESQ=?	Response +CESQ: (list of supported <rxlev>s),(list of supported <ber>s, list of supported <rsrp>s),(list of supported <ecno>s,(list of supported <rsrq>s),(list of supported <rsrp>s) OK

Execution Command AT+CESQ	Response +CESQ: <rxlev>,<ber>,<rsqp>,<ecno>,<rsrq>,<rsrp> OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<rxlev>	Integer type; not supported by NB-IoT 99 not known or not detectable
<ber>	Integer type; not supported by NB-IoT 99 not known or not detectable
<rsqp>	Integer type; not supported by NB-IoT 255 not known or not detectable
<ecno>	Integer type; not supported by NB-IoT 255 not known or not detectable
<rsrq>	0 rsrq<-19.5dB 1 -19.5dB<=rsrq<-19dB 2 -19dB<=rsrq<-18.5dB ::: 32 -4dB<=rsrq<-3.5dB 33 -3.5dB<=-3 dB 34 -3 dB <=rsrq 255 not known or not detectable
<rsrp>	0 rsrp<-149dBm 1 -140dBm<=rsrp<-139dBm 2 -139dBm<=rsrp<-138dBm ::: 95 -46dBm<=rsrp<-45dBm 96 -45dBm<=rsrp<-44dBm 97 -44dBm<=rsrp 255 not known or not detectable

3.2.10 AT+CGPADDR Show PDP Address

AT+CGPADDR Show PDP Address

Test Command	Response
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AT+CGPADDR=?	<p>+CGPADDR: (list of defined<cid>s)</p> <p>OK or OK</p>
<p>Write Command</p> <p>AT+CGPADDR[=<cid>[,<cid>[,...]]]</p>	<p>Response</p> <p>+CGPADDR: <cid>[,<PDP_addr>][<CR><LF>+CGPADDR: <cid>[,<PDP_addr>][...]]</p> <p>[+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][<CR><LF>+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [...]]</p> <p>OK or OK or ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned.
<PDP_addr>	<p>A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic.</p> <p>For a static address, it will be the one set by the +CGDCONT command when the context was defined.</p> <p>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.</p>
<cid>	Integer type; specifies a particular PDP context definition (see the +CGDCONT command).
<PDP_addr_1> and <PDP_addr_2>	Each is a string type that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none is available. Both <PDP_addr_1> and <PDP_addr_2> are included when both IPv4 and

IPv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address.

The string is given as dot-separated numeric (0-255) parameter of the form: a1.a2.a3.a4 for IPv4 and

a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

When +CGPIAF is supported, its settings can influence the format of the IPv6 address in parameter <PDP_addr_1> or <PDP_addr_2> returned with the execute form of +CGPADDR.

NOTE

In dual-stack terminals (<PDP_type> IPV4V6), the IPv6 address will be provided in <PDP_addr_2>. For terminals with a single IPv6 stack (<PDP_type> IPv6) or due to backwards compatibility, the IPv6 address can be provided in parameter <PDP_addr_1>.

3.2.11 AT+COPS Operator Selection

AT+COPS Operator Selection

<p>Test Command AT+COPS=?</p>	<p>Response TA returns a list of quadruplets, each representing an operator present in the network. 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, and other networks.</p> <p>+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)]</p> <p>OK If error is related to ME functionality: +CME ERROR: <err></p>
<p>Read Command AT+COPS?</p>	<p>Response TA returns the current mode and the currently selected operator. If no operator is selected, <format> and <oper> are omitted.</p> <p>+COPS: <mode>[, <format>, <oper>][, <Act>]</p> <p>OK If error is related to ME functionality: +CME ERROR: <err></p>
<p>Write Command AT+COPS=<mode>[, <format>[, <oper>[, <Act></p>	<p>Response TA forces an attempt to select and register the GSM network operator. If the selected operator is not available, no other operator shall be selected</p>

>]]]	(except <mode>=4). The selected operator name format shall apply to further read commands (AT+COPS?).
	<p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	Test command: 45 seconds Write command: 120 seconds
Reference	3GPP TS 27.007 [14]

Defined Values

<stat>	<p>Integer type</p> <p>0 Unknown</p> <p>1 Operator available</p> <p>2 Operator current</p> <p>3 Operator forbidden</p>
<oper>	<p>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; numeric format is the GSM Location Area Identification number which consists of a three BCD digit ITU-T country code coded, plus a two or three BCD digit network code, which is administration specific.</p>
<mode>	<p>Integer type</p> <p>0 Automatic mode; <oper> field is ignored</p> <p>1 Manual(<oper>field shall be present, and <Act> optionally)</p> <p>2 Manual deregister from network</p> <p>3 Set only <format> (for read Command +COPS?) - not shown in Read Command response</p> <p>4 Manual/automatic(<oper>field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered</p>
<format>	<p>Integer type</p> <p>0 Long format alphanumeric <oper></p> <p>1 Short format alphanumeric <oper></p> <p>2 Numeric <oper></p>
<Act>	<p>Integer type; access technology selected</p> <p>0 GSM</p> <p>1 GSM Compact</p> <p>2 UTRAN</p> <p>3 GSM w/EGPRS (see NOTE 1)</p> <p>4 UTRAN w/HSDPA (see NOTE 2)</p> <p>5 UTRAN w/HSUPA (see NOTE 2)</p>

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

NOTE

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

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

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

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

- <Act>, if provided, must be set to 9
- Only <format>=2 is supported
- Only <mode>=0, <mode>=1 & <mode>=2 are supported

When <mode>=1 is used, the PLMN setting will not persist after the UE is rebooted

<mode>=1 is only for development use. <mode>=0 should be used in production, which the mode used when AUTOCONNECT is enabled.

- The test command currently returns the configured values rather than performing a PLMN search.
- Not return <ACT> for AT+COPS?
- <oper> field couldn't be present when <mode>=0;
- AT+COPS=? will start background PLMN search when MT is idle state and wait searching result, other state will return ERROR.
- Return the searched PLMN list in the network after searching.

And could be aborted by any characters when searching. See Chapter 9 for more details about abort.

3.2.12 AT+CGATT Attach or Detach from GPRS Service

AT+CGATT Attach or Detach from GPRS Service

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. Refer to Chapter 9: Error Values for possible <err> values.

NOTE 1: If the initial PDP context is supported, the context with <cid>=0 is

	<p><i>automatically defined at startup.</i></p> <p>Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.</p> <p>The read command returns the current Packet Domain service state.</p> <p>The test command is used for requesting information on the supported Packet Domain service states.</p> <p>NOTE 2: This command has the characteristics of both the V.250 action and parameter commands.</p> <p>Hence it has the read form in addition to the execution/set and test forms.</p>
<p>Test Command</p> <p>AT+CGATT=?</p>	<p>Response</p> <p>+CGATT: (list of supported <state>s)</p> <p>OK</p>
<p>Read Command</p> <p>AT+CGATT?</p>	<p>Response</p> <p>+CGATT: <state></p> <p>OK</p>
<p>Write Command</p> <p>AT+CGATT=<state></p>	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	75 seconds
Reference	

Defined Values

<state>	<p>Integer type; indicates the state of PDP context activation. The default value is manufacturer specific</p> <p>0 Detached</p> <p>1 Attached</p> <p>Other values are reserved and will result in an ERROR response to the Write Command.</p>
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NOTE

- When **<state>**=1 is selected, **+COPS=0** is automatically selected.
- If a **CGATT** is in progress, further execution of the **CGATT=**command prior to the attach or detach completing will return error.

3.2.13 AT+CGACT PDP Context Activate or Deactivate

AT+CGACT PDP Context Activate or Deactivate

<p>Description</p>	<p>The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.250 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message. Refer to Chapter 9: Error Values for possible <err> values.</p> <p>For EPS, if an attempt is made to disconnect the last PDN connection, then the MT responds with ERROR or, if extended error responses are enabled, a +CME ERROR.</p> <p>NOTE: If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.</p> <p>For EPS, the activation request for an EPS bearer resource will be answered by the network by either an EPS dedicated bearer activation or EPS bearer modification request. The request must be accepted by the MT before the PDP context can be set in to established state.</p> <p>If no <cid>s are specified the activation form of the command activates all defined non-emergency contexts.</p> <p>If no <cid>s are specified the deactivation form of the command deactivates all active contexts.</p> <p>The read command returns the current activation states for all the defined PDP contexts.</p> <p>The test command is used for requesting information on the supported PDP context activation states.</p> <p>NOTE. This command has the characteristics of both the V.250 action and parameter commands.</p> <p>Hence it has the read form in addition to the execution/set and test forms.</p>
<p>Test Command AT+CGACT=?</p>	<p>Response +CGACT: (list of supported <state>s)</p> <p>OK</p>
<p>Read Command AT+CGACT?</p>	<p>Response +CGACT: <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>...]</p>

	OK
Write Command AT+CGACT=<state>[,<cid>]	Response OK If error is related to ME functionality: +CME ERROR:<err>
Parameter Saving Mode	NO_SAVE
Max Response Time	150 seconds
Reference	

Defined Values

<state>	Indicates the state of PDP context activation 0 Deactivated 1 Activated Other values are reserved and will result in an ERROR response to the Write Command.
<cid>	A numeric parameter which specifies a particular PDP context definition (see +CGDCONT Command). If the <cid> is omitted, it only affects the first cid.

NOTE

- Could only activate or deactivate one cid one time.
- Could not be executed when PLMN searching, attaching or detaching.
- Could disconnect the last PDN connection when MT and Core Network all support without PDN connection.

3.2.14 AT+CIMI Request International Mobile Subscriber Identity

AT+CIMI Request International Mobile Subscriber Identity	
Description	Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT.
Test Command AT+CIMI=?	Response OK
Execution Command AT+CIMI	Response TA returns <IMSI> for identifying the individual SIM which is attached to ME. <IMSI> OK If error is related to ME functionality: +CME ERROR: <err>

Parameter Saving Mode	NO_SAVE
Max Response Time	20s
Reference	3GPP TS 27.007 [13]

Defined Values

<IMSI>	International Mobile Subscriber Identity (string without double quotes)
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NOTE

IMSI may not be displayed for a few seconds after power-on

3.2.15 AT+CGDCONT Define PDP Context

AT+CGDCONT Define PDP Context

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid> and also allows the TE to specify whether security protected transmission of ESM information is requested, because the PCO can include information that requires ciphering. There can be other reasons for the UE to use security protected transmission of ESM information, e.g. if the UE needs to transfer an APN. 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. Refer to Chapter 9: Error Values for possible <err> values.

For EPS the PDN connection and its associated EPS default bearer is identified herewith.

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

If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see 3GPP TS 27.007 V13.5.0, subclause 10.1.0. As all other contexts, the parameters for <cid>=0 can be modified with +CGDCONT. If the initial PDP context is supported, +CGDCONT=0 resets context number 0 to its particular default settings.

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

	<p>The test command returns values supported as compound values. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.</p>
<p>Test Command AT+CGDCONT=?</p>	<p>Response</p> <p>+CGDCONT: (range of supported<cid>s),<PDP_type>,,,(list of supported<d_comp>s),(list of supported<h_comp>s),(list of supported<IPv4AddrAlloc>s),(list of supported<request_type>s),(list of supported<PCSCF_discovery>s),(list of supported<IM_CN_Signalling_Flag_Ind>s),(list of supported<NSLPI>s),(list of supported<securePCO>s),(list of supported<IPv4_MTU_discovery>s),(list of supported<Local_Addr_Ind>s),(list of supported<NonIP_MTU_discovery>s),(list of supported<Reliable_Data_Service>s)[<CR><LF>+CGDCONT: (range of supported<cid>s),<PDP_type>,,,(list of supported<d_comp>s),(list of supported<h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported<request_type>s),(list of supported<PCSCF_discovery>s),(list of supported<IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported<securePCO>s),(list of supported<IPv4_MTU_discovery>s),(list of supported<Local_Addr_Ind>s),(list of supported <NonIP_MTU_discovery>s),(list of supported<Reliable_Data_Service>s)[...]]</p> <p>OK</p>
<p>Read Command AT+CGDCONT?</p>	<p>Response</p> <p>[+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>]]]]]]]]]]]]]]]]][<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>]]]]]]]]]]]]]]] [...]]</p> <p>OK</p>
<p>Write Command AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,</p>	<p>Response</p> <p>OK or ERROR</p>

<P-CSCF_discovery>[, <IM_CN_Signalling_Flag_Ind>[, <NSLPI>[, <securePCO>[, <IPv4_MTU_discovery>], <Local_Addr_Ind>], <Non-IP_MTU_discovery>], <Reliable_Data_Service>]]]]]]]]]]]]]	
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<cid>	<p>Integer type; 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 is returned by the test form of the command.</p> <p><cid> values of 0-10 are supported.</p>
<PDP_type>	<p>String type; specifies the type of packet data protocol. The default value is manufacturer specific.</p> <p>X.25 ITU-T/CCITT X.25 layer 3 (Obsolete)</p> <p>IP Internet Protocol (IETF STD 5 [103])</p> <p>IPV6 Internet Protocol, version 6</p> <p>IPV4V6 Virtual<PDP_type> introduced to handle dual IP stack UE capability.</p> <p>OSPIH Internet Hosted Octect Stream Protocol (Obsolete)</p> <p>PPP Point to Point Protocol (IETF STD 51 [104])</p> <p>NOTE 2: Only IP, IPV6 and IPV4V6 values are supported for EPS services.</p> <p>NONIP None Ip</p>
<APN>	<p>String type; 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.</p>
<PDP_addr>	<p>String type; identifies the MT in the address space applicable to the PDP. This parameter can be left blank.</p> <p>When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGDCONT.</p> <p>NOTE 3: The value of this parameter is ignored with the set command. The parameter is included in the set command for backwards compatibility reasons only.</p>
<d_comp>	<p>Integer type; controls PDP data compression</p> <p>0 off</p> <p>1 on (manufacturer preferred compression)</p> <p>2 V.42bis</p> <p>3 V.44</p>
<h_comp>	<p>Integer type; controls PDP header compression</p>

	<ul style="list-style-type: none"> 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)
<IPv4AddrAlloc>	<p>Integer type; controls how the MT/TA requests to get the IPv4 address information</p> <ul style="list-style-type: none"> 0 IPv4 address allocation through NAS signalling 1 IPv4 address allocated through DHCP
<request_type>	<p>Integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 (subclause 6.5.1.2) and 3GPP TS 24.008 subclause 10.5.6.17). If the initial PDP context is supported it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearerservices.</p> <p>NOTE 4: If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 subclause 4.3.12.9.</p> <ul style="list-style-type: none"> 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific) <ul style="list-style-type: none"> 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment 3 PDP context is for handover from a non-3GPP access network
<P-CSCF_discovery >	<p>Integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.</p> <ul style="list-style-type: none"> 0 Preference of P-CSCF address discovery not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling 2 Preference of P-CSCF address discovery through DHCP
<IM_CN_Signalling_Flag_Ind>	<p>Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.</p> <ul style="list-style-type: none"> 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only
<NSLPI>	<p>Integer type; indicates the NAS signalling priority requested for this PDP context:</p> <ul style="list-style-type: none"> 0 indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT. 1 indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signalling low priority". <p>3GPP TS 24.301 [83] and 3GPP TS 24.008 .</p>
<securePCO>	<p>Integer type. Specifies if security protected transmission of PCO is requested</p>

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

NOTE

- Only <PDP_type>="IP","NONIP","IPV6","IPV4V6" are supported.
- Only support +CGDCONT=<cid>,<PDP_type>,<APN>,,,,,,<NSLPI>,<securePCO>.
- <cid> values of 0-10 are supported
- Only <hcomp> and <dcomp> values of 0 are supported.
- <cid> value of 7 can't be set when bip is enabled.
- The APN is a string of up to 63 characters.

3.2.16 AT+CFUN Set Phone Functionality

AT+CFUN Set Phone Functionality

Description	<p>Set command selects the level of functionality in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn.</p> <p>Read command returns the current setting of <fun>.</p> <p>Test command returns values supported by the MT as compound values.</p>
Test Command	Response

AT+CFUN=?	+CFUN: (list of supported <fun>s),(list of supported <rst>s)
	OK If error is related to ME functionality: +CME ERROR: <err>
Read Command AT+CFUN?	Response +CFUN: <fun>
	OK If error is related to ME functionality: +CME ERROR:<err>
Write Command AT+CFUN=<fun>[,<rst>]	Response OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	10s
Reference	3GPP TS 27.007 [13]

Defined Values

<fun>	Integer type 0 Minimum functionality 1 Full functionality 4 Turn off RF
<rst>	Integer type 0 Do not reset the MT before setting it to <fun> power level. This shall always be defaulted when <rst> is not given. 1 Reset the MT before setting it to <fun> power level. (not supported and will be ignored)

3.2.17 AT+CMEE Report Mobile Equipment Error

AT+CMEE Report Mobile Equipment Error	
Description	Set command disables or enables the use of final result code +CME ERROR: <err> as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

	Read command returns the current setting of <n>. Test command returns values supported as a compound value.
Test Command AT+CMEE=?	Response +CMEE: (list of supported <n>s) OK
Read Command AT+CMEE?	Response +CMEE: <n> OK
Write Command AT+CMEE=<n>	Response TA disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the ME. OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<n>	integer type 0 Disable +CME ERROR: <err> result code and use ERROR instead. <u>1</u> Enable +CME ERROR: <err> result code and use numeric <err> 2 Enable +CME ERROR: <err> result code and use verbose <err> values
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3.2.18 AT+CCLK Return Current Date & Time

AT+CCLK Return Current Date & Time	
Test Command AT+CCLK=?	Response OK
Read Command AT+CCLK?	Response +CCLK: [<yyyy/MM/dd, hh:mm:ss> [<zz>]] OK If error is related to ME functionality: +CME ERROR: <err>
Write Command AT+CCLK="<time>"	Response OK If error is related to ME functionality:

	+CME ERROR: <err>
	ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007 [13]	

Defined Values

<time>	String type value; format is "yyyy/MM/dd,hh:mm:ss±zz", where characters indicate year (four 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 1994, 22:10:00 GMT+2 hours equals to "1994/05/06,22:10:00+08"
---------------------	---

NOTE

- No value will be returned before core network sent EMM INFORMATION.
- If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?

3.2.19 AT+CPSMS Power Saving Mode Setting

AT+CPSMS Power Saving Mode Setting

Description	<p>The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value. See the unsolicited result codes provided by command +CEREG for the Active Time value and the extended periodic TAU value that are allocated to the UE by the network in E-UTRAN.</p> <p>A special form of the command can be given as +CPSMS=2. In this form, the use of PSM will be disabled and data for all parameters in the command +CPSMS will be removed or, if available, set to the manufacturer specific default values.</p> <p>The read command returns the current parameter values.</p>
-------------	---

	The test command returns the supported <mode>s and the value ranges for the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value as compound values.
Test Command AT+CPSMS=?	Response +CPSMS: (list of supported <mode>s),(list of supported <Requested_Periodic-RAU>s),(list of supported <Requested_GPRS-READY-timer>s),(list of supported <Requested_Periodic-TAU>s),(list of supported <Requested_Active-Time>s) OK
Read Command AT+CPSMS?	Response +CPSMS: <mode>,[<Requested_Periodic-RAU>],[<Requested_GPRS-READY-timer>],[<Requested_Periodic-TAU>],[<Requested_Active-Time>] OK
Write Command AT+CPSMS=[<mode>,[<Requested_Periodic-RAU>,[<Requested_GPRS-READY-timer>],[<Requested_Periodic-TAU>],[<Requested_Active-Time>]]]]	Response OK If failed: +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	Integer type. Indication to disable or enable the use of PSM in the UE. 0 Disable the use of PSM 1 Enable the use of PSM 2 Disable the use of PSM and discard all parameters for PSM or, if available, reset to the manufacturer specific default values.
<Requested_Periodic-RAU>	String type; one byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN/UTRAN. The requested extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS 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 23.060 [47]. The default value, if available, is manufacturer specific.
<Requested_GPRS-READY-timer>	String type; one byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN/UTRAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008 [8] Table 10.5.172/3GPP TS 24.008. See also 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.
<Requested_Periodic-TAU>	String type; one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82]. The default value, if available, is manufacturer specific.
<Requested_Active-Time>	String type; one byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149], 3GPP TS 23.060 [47] and 3GPP TS 23.401 [82]. The default value, if available, is manufacturer specific.

NOTE

- RAU is not supported by NB-IOT. No value will be output, and any input will be ignored.
- <Requested_Periodic-TAU> and <Requested_Active-Time> could be quoted.

3.2.20 AT+CEDRXS Extended-DRX Setting

AT+CEDRXS Extended-DRX Setting	
Description	<p>The set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.</p> <p>The set command also controls the presentation of an unsolicited result code</p> <p>+CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[</p>

	<p>,<Paging_time_window>]]]</p> <p>when<n>=2 and there is a change in the eDRX parameters provided by the network.</p> <p>A special form of the command can be given as +CEDRXS=3. In this form, eDRX will be disabled and data for all parameters in the command +CEDRXS will be removed or, if available, set to the manufacturer specific default values.</p> <p>The read command returns the current settings for each defined value of <AcT-type>.</p> <p>The test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values.</p>
<p>Test Command</p> <p>AT+CEDRXS=?</p>	<p>Response</p> <p>+CEDRXS: (list of supported <mode>s),(list of supported<AcT-type>s),(list of supported<Requested_eDRX_value>s)</p> <p>OK</p>
<p>Read Command</p> <p>AT+CEDRXS?</p>	<p>Response</p> <p>+CEDRXS:<AcT-type>,<Requested_eDRX_value></p> <p>OK</p>
<p>Write Command</p> <p>AT+CEDRXS=[<mode>],[<AcT-type>],[<Requested_eDRX_value>]]]</p>	<p>Response</p> <p>OK</p> <p>If failed:</p> <p>+CME ERROR: <err></p>
<p>Parameter Saving Mode</p>	AUTO_SAVE
<p>Max Response Time</p>	-
<p>Reference</p>	

Defined Values

<mode>	<p>Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.</p> <p>0 Disable the use of eDRX</p> <p><u>1</u> Enable the use of eDRX</p> <p>2 Enable the use of eDRX and enable the unsolicited result code +CEDRXP:<AcT-type>,<Requested_eDRX_value>,<NW-provided_eDRX_value>,<Paging_time_window>]]]</p> <p>3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</p>
<AcT-type>	<p>Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p>

	5 E-UTRAN (NB-S1 mode)
<Requested_eDRX_value>	String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.
<NW-provided_eDRX_value>	String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.
<Paging_time_window>	String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

3.2.21 AT+CEDRXDP eDRX Read Dynamic Parameters

AT+CEDRXDP eDRX Read Dynamic Parameters	
Description	The execution command returns <AcT-type> and <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if eDRX is used for the cell that the MS is currently registered to. If the cell that the MS is currently registered to is not using eDRX, AcT-type=0 is returned.
Test Command AT+CEDRXDP=?	Response OK
Execution Command AT+CEDRXDP	Response +CEDRXDP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] OK If error is related to ME functionality: +CME ERROR:<err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<AcT-type>	Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value 0 Access technology is not using eDRX 5 E-UTRAN(NB-S1 mode)
<Requested_Edrx_value>	String type; half a byte in a 4-bit format. The Edrx value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<NW-provided_eDRX_value>	String type; half a byte in a 4-bit format. The eDRX value Refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<Paging_time_window>	String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 octet 3 of the Extended DRX. Parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

3.2.22 AT+CTZR Time Zone Reporting

AT+CTZR Time Zone Reporting	
Description	<p>This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>, +CTZE: <tz>,<dst>,[<time>], or +CTZEU: <tz>,<dst>,[<utime>] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. If setting fails in an MT error, +CME ERROR: <err> is returned. Refer to Chapter 9: Error Values for possible <err> values.</p> <p>Read command returns the current reporting settings in the MT. Test command returns supported <reporting>-values as a compound value.</p>
Test Command AT+CTZR=?	<p>Response +CTZR: (list of supported <reporting>s)</p> <p>OK</p>
Read Command	Response

AT+CTZR?	+CTZR: <reporting> OK If error is related to ME functionality: +CME ERROR: <err>
Write Command AT+CTZR=<reporting>	Response OK If error is related to ME functionality: +CME ERROR: <err>
Unsolicited result code	+CTZV: <zone>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<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(not support) +CTZE: <tz>,<dst>,[<time>]. 3 Enable extended time zone and universal time reporting by unsolicited result code +CTZEU: <tz>,<dst>,[<utime>].
<tz>	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".
<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
<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.

3.2.23 AT+CTZU Automatic Time Zone Update

AT+CTZU Automatic Time Zone Update	
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.
Test Command AT+CTZU=?	Response +CTZU: (lists of supported <onoff>s) OK
Read Command AT+CTZU?	Response +CTZU: <onoff> OK
Write Command AT+CTZU=<onoff>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<onoff>	0 Disable automatic time zone update via NITZ. <u>1</u> Enable automatic time zone update via NITZ.
---------	--

3.2.24 AT+CIPCA Initial PDP context activation

AT+CIPCA Initial PDP context activation	
Description	<p>The set command controls whether an initial PDP context (see subclause 10.1.0) shall be established automatically following an attach procedure when the UE is attached to GERAN or UTRAN RATs and whether the UE is attached to E-UTRAN with or without a PDN connection.</p> <p>For $\langle n \rangle \neq 0$, deactivating the last (active) PDP context can lead to a (re)establishment of the initial PDP context. Changing setting of $\langle n \rangle$ from 0 to 1 will cause an immediate attempt to (re)establish the initial PDP context if no PDP context is active. Changing $\langle n \rangle$ from 0 to 2 will if not roaming cause an immediate attempt to (re)establish the initial PDP context if no other PDP context is active. The value of $\langle n \rangle = 3$ applies to E-UTRAN RATs and does not change the setting of PDP context activation in GERAN or UTRAN RATs. Changing $\langle n \rangle$ will never cause a PDP context deactivation.</p> <p>For $\langle \text{AttachWithoutPDN} \rangle = 1$, the EPS Attach is performed without a PDN connection.</p> <p>NOTE: For this command, the term roaming corresponds to being registered to a VPLMN which is not equivalent to HPLMN or EHPLMN.</p> <p>The read command returns the current setting of the command. The test command returns values supported as a compound value.</p> <p>Refer to Chapter 9: Error Values for possible $\langle \text{err} \rangle$ values</p>
Test Command AT+CIPCA=?	<p>Response</p> <p>+CIPCA:(list of supported $\langle n \rangle$s),(list of supported $\langle \text{AttachWithoutPDN} \rangle$s)</p> <p>OK</p>
Read Command AT+CIPCA?	<p>Response</p> <p>+CIPCA: $\langle n \rangle$ [, $\langle \text{AttachWithoutPDN} \rangle$]</p> <p>OK</p>
Write Command AT+CIPCA=[$\langle n \rangle$ [, $\langle \text{AttachWithoutPDN} \rangle$]]	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: $\langle \text{err} \rangle$</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

$\langle n \rangle$	Integer type. Activation of PDP context upon attach. 0 Do not activate
---------------------	---

	<p>1 Always activate</p> <p>2 Activate when not roaming</p> <p>3 No change in current setting</p>
<AttachWithoutPDN	Integer type. EPS Attach with or without PDN connection.
>	<p>0 EPS Attach with PDN connection</p> <p>1 EPS Attach without PDN connection</p>

NOTE

- Only <n>=3 is supported.
- If <AttachWithoutPDN> is omitted, will use the default value 0.

3.2.25 AT+CGAPNRC APN Rate Control

AT+CGAPNRC APN Rate Control	
Description	<p>This execution command returns the APN rate control parameters (see 3GPP TS 24.008 [8]) associated to the provided context identifier <cid>.</p> <p>If the parameter <cid> is omitted, the APN rate control parameters for all active PDP contexts are returned. The test command returns a list of <cid>s associated with secondary and non-secondary active PDP contexts.</p> <p>Refer to Chapter 9: Error Values for possible <err> values.</p>
Test Command AT+CGAPNRC=?	Response +CGAPNRC: (list of <cid>s associated with active contexts) OK or +CME ERROR: <err>
Write Command AT+CGAPNRC[=<cid>]	Response [+CGAPNRC: <cid>[,<Additional_exception_reports>[,<Uplink_time_unit>[,<Maximum_uplink_rate>]]][<CR><LF> +CGAPNRC: <cid>[,<Additional_exception_reports>[,<Uplink_time_unit>[,<Maximum_uplink_rate>]]][...]] OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	Integer type; specifies a particular PDP context definition (see the +CGDCONT command).
<Additional_exception_reports>	Integer type; indicates whether or not additional exception reports are allowed to be sent when the maximum uplink rate is reached. This refers to bit 4 of octet 1 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2. 0 Additional_exception_reports at maximum rate reached are not allowed to be sent. 1 Additional_exception_reports at maximum rate reached are allowed to be sent.
<Uplink_time_unit>	Integer type; specifies the time unit to be used for the maximum uplink rate. This refers to bits 1 to 3 of octet 1 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2. 0 unrestricted 1 minute 2 hour 3 day 4 week
<Maximum_uplink_rate>	Integer type; specifies the maximum number of messages the UE is restricted to send per uplink time unit. This refers to octet 2 to 4 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2.

3.2.26 AT+CSODCP Sending of Originating Data via the Control Plane

AT+CSODCP Sending of Originating Data via the Control Plane	
Description	<p>The set command is used by the TE to transmit data over control plane to network via MT. Context identifier <cid> is used to link the data to particular context.</p> <p>This command optionally indicates that the application on the MT expects that the exchange of data:</p> <ul style="list-style-type: none"> - will be completed with this uplink data transfer; or - will be completed with the next received downlink data. <p>This command also optionally indicates whether or not the data to be transmitted is an exception data.</p> <p>This command causes transmission of an ESM DATA TRANSPORT message, as defined in 3GPP TS 24.301 [83].</p> <p>Test command returns the maximum number of bytes of the user data container supported by the MT, supported <RAI>s and supported</p>

	<p><type_of_user_data>s as a compound value.</p> <p>If <sequence>is not omitted, when datagram is sent by rf or discard, will report the result +CSODCPR: <cid>,<sequence>,<status>.</p>
<p>Test Command</p> <p>AT+CSODCP=?</p>	<p>Response</p> <p>+CSODCP:(range of supported <cid>s),(maximum number of bytes of the <cpdata_length>),(list of supported <RAI>s),(list of supported <type_of_user_data>s)</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CSODCP=<cid>,<cpdata_length>,<cpdata>[,<RAI>[,<type_of_user_data>[,<sequence>]]]</p>	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p> <p>Parameters</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	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 command).
<cpdata_length>	Integer type. Indicates the number of bytes of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.
<cpdata>	String of octets. 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.
<RAI>	Integer type. Indicates the value of the release assistance indication, refer 3GPP TS 24.301 [83] subclause 9.9.4.25. <u>0</u> No information available. 1 The MT expects that exchange of data will be completed with the transmission of the ESM DATA TRANSPORT message. 2 The MT expects that exchange of data will be completed with the receipt of an ESM DATA TRANSPORT message.
<type_of_user_data>	Integer type. Indicates whether the user data that is transmitted is regular or

	<p>exceptional.</p> <p>0 Regular data.</p> <p>1 Exception data.</p>
<sequence>	<p>Sequence of data, range 1-255.If omit, will not report data sent status.</p> <p>NOTE: <sequence> is not defined by 3GPP but only used for HiSi.</p>
<status>	<p>The status of datagram.</p> <p>0 Error</p> <p>1 Sent</p>

NOTE

- Maximum data length will be 950 bytes when non-IP is used, otherwise will be 0.
- Only one message will be buffered at any one time.

3.2.27 AT+CRTDCP Reporting of Terminating Data via the Control Plane

AT+CRTDCP Reporting of Terminating Data via the Control Plane

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 +CRTDCP: <cid>,<cpdata_length>,<cpdata> when data is received from the network. Read command returns the current settings.</p> <p>Test command returns supported values as compound values.</p> <p>Refer to Chapter 9: Error Values for possible <err> values.</p>
Test Command AT+CRTDCP=?	<p>Response</p> <p>+CRTDCP:(list of supported <reporting>s),(range of supported <cid>s),(maximum number of octets of user data indicated by <cpdata_length>)</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
Read Command AT+CRTDCP?	<p>Response</p> <p>+CRTDCP: <reporting></p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
Write Command AT+CRTDCP=<reporting>	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality:</p>

	+CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<reporting>	Integer type, controlling reporting of mobile terminated control plane data events <u>0</u> Disable reporting of MT control plane data. <u>1</u> Enable reporting of MT control plane data by the unsolicited result code +CRTDCP.
<cid>	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 command).
<cpdata_length>	Integer type. Indicates the number of bytes of the <cpdata> information element. When there is no data to transmit, the value shall be set to zero.
<cpdata>	String of octets. 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.

NOTE

- Maximum data length will be 1358 bytes when non-IP is used, otherwise will be 0.
- Only one message will be buffered at any one time.
- Terminating data via the control plane before enable reporting will be discarded.

3.2.28 AT+CGEREP Packet Domain Event Reporting

AT+CGEREP Packet Domain Event Reporting

Description	Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the
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	<p>effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.</p> <p>Read command returns the current mode and buffer settings.</p> <p>Test command returns the modes and buffer settings supported by the MT as compound values.</p>
<p>Test Command</p> <p>AT+CGEREP=?</p>	<p>Response</p> <p>+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p>Read Command</p> <p>AT+CGEREP?</p>	<p>Response</p> <p>+CGEREP: <mode>,<bfr></p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CGEREP=<mode>[,<bfr>]</p>	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	<p>0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded.No codes are forwarded to the TE.</p> <p>1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.</p>
<bfr>	<p>0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 ; Only support it now.</p>

3.2.29 AT+CGEV Indicate EPS PDN Connection and Bearer Resources Operations Status

+CGEV Indicate EPS PDN Connection and BearerResources Operations Status	
Description	<p>This is an unsolicited message to indicate EPS PDN connection and bearer resources operations status</p> <p>+CGEV: NW PDN DEACT <cid></p>

Defined Values

<cid>	The format is found in command +CGDCONT <cid> values of 0-10 are supported.
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3.2.30 AT+CGCONTRDP PDP Context Read Dynamic Parameters

AT+CGCONTRDP PDP Context Read Dynamic Parameters

Description	<p>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> and <Reliable_Data_Service> for an active non secondary PDP context with the context identifier <cid>. If the MT indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple lines of information per <cid> will be returned.</p> <p>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.</p> <p>NOTE: <i>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.</i></p> <p>If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned.</p> <p>The test command returns a list of <cid>s associated with active non secondary contexts.</p>
Test Command AT+CGCONTRDP=?	<p>Response</p> <p>+CGCONTRDP: (list of<cid>s associated with active contexts)</p> <p>OK</p> <p>or</p> <p>OK</p>
Write Command AT+CGCONTRDP[=<cid>]	<p>Response</p> <p>[+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P</p>

<DNS_sec_addr>	String type; shows the IP address of the secondary DNS server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<P_CSCF_prim_addr> >	String type; shows the IP address of the primary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<P_CSCF_sec_addr> >	String type; shows the IP address of the secondary P-CSCF server. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.
<IM_CN_Signalling_Flag>	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 indicates 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.
<Reliable_Data_Service>	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 |

NOTE

- Only support <cid>,<apn>,<DNS_prim_addr>,<DNS_sec_addr> now.
- <DNS_prim_addr>,<DNS_sec_addr> could display only when <PDP_type> is "IP" or "IPV6".
- Could configure PDP context dynamic parameter items to read by +NCPCDPR.

3.2.31 AT+CGAUTH Define PDP Context Authentication Parameters

AT+CGAUTH Define PDP Context Authentication Parameters

<p>Description</p>	<p>Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter <cid> used during the PDP context activation and the PDP context modification procedures. Since the <cid> is the same parameter that is used in the +CGDCONT command, +CGAUTH is effectively as an extension to these commands.</p> <p>The read command returns the current settings for each defined context. The test command returns values supported as compound values.</p>
<p>Test Command AT+CGAUTH=?</p>	<p>Response</p> <p>+CGAUTH: (range of supported<cid>s),(list of supported<auth_prot>s),(range of supported<userid>s),(range of supported<password>s)</p> <p>OK</p>
<p>Read Command AT+CGAUTH?</p>	<p>Response</p> <p>[+CGAUTH: <cid>,<auth_prot>,<userid>,<password>][<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password> [...]]</p> <p>OK</p>
<p>Write Command AT+CGAUTH=<cid>[,<auth_prot>[,<userid>[,<password>]]]</p>	<p>Response</p> <p>When <auth_prot>/<username>/<password> set:</p> <p>OK</p> <p>When no <auth_prot>/<username>/<password> set displays current auth_prot username and password for <cid>:</p> <p>+CGAUTH: <cid>,<auth_prot>,<username>,<password></p>

	<p>OK</p> <p>If error is related to wrong AT syntax:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	Integer type. Specifies a particular PDP context definition (see the +CGDCONT command).
<auth_prot>	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
<userid>	String type. User name for access to the IP network.
<password>	String type. Password for access to the IP network.

NOTE

- <userid> is needed when <auth_prot> is 1 or 2.
- Maximum <userid> string and <password> string length is 60.

3.2.32 AT+CPIN Enter PIN

AT+CPIN Enter PIN

Description	<p>Set command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE. Refer to Chapter 9 for possible <err> values.</p> <p>NOTE 1: SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM PUK2 refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC.</p> <p>If the PIN required is SIM PUK or SIM PUK2, the second pin is required.</p>
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	<p>This second pin, <newpin>, is used to replace the old pin in the SIM.</p> <p>NOTE 2: <i>Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH-SIM are: +CGMI, +CGMM, +CGMR, +CGSN, D112; (emergency call), +CPAS, +CFUN,+CPIN, +CPINR, +CDIS (read and test command only), and +CIND (read and test command only). It is implementation specific whether additional commands can be accepted when MT is pending SIM PIN, SIM PUK, or PH-SIM.</i></p> <p>Read command returns an alphanumeric string indicating whether some password is required or not.</p>
<p>Test Command AT+CPIN=?</p>	<p>Response OK</p>
<p>Read Command AT+CPIN?</p>	<p>Response +CPIN: <code></p> <p>OK</p>
<p>Write Command AT+CPIN=<pin>[,<new pin>]</p>	<p>Response OK</p> <p>If error is related to ME functionality: +CME ERROR:<err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	5s
Reference	3GPP TS 27.007 [13]

Defined Values

<code>	<p>READY MT is not pending for any password</p> <p>SIM PIN MT is waiting SIM PIN to be given</p> <p>SIM PUK MT is waiting for SIM PUK to be given</p> <p>SIM PUK BLOCKED</p>
<pin>	String type; password
<new pin>	String type; If the PIN required is SIM PUK or SIMPUK2: new password

NOTE

Set and read could execute only when power on.

3.2.33 AT+CLCK Facility Lock

AT+CLCK Facility Lock

Description	Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Test command returns facility values supported as a compound value.
Test Command AT+CLCK=?	Response OK
Write Command AT+CLCK=<fac>,<mode>[,<passwd>]	Response OK or +CME ERROR: <err> When <mode>=2 and command successful: +CLCK: <status>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<fac>	"SC" SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)
<mode>	0 Unlock 1 Lock 2 Query status
<status>	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

3.2.34 AT+CMOLR Mobile Originated Location Request

AT+CMOLR Mobile Originated Location Request

Description	Set command initiates a mobile originated location request (MO-LR). The parameter <enable> enables or disables positioning and reporting by unsolicited result codes. Reporting can be performed in the format of GAD shapes <location_parameters> or in the format of NMEA strings <NMEA-string> or both.
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Defined Values

<enable>	<p>0 Disables reporting and positioning</p> <p>1 Enables reporting of NMEA strings by unsolicited result code +CMOLRN: <NMEA-string>. Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.</p> <p>2 Enables reporting of GAD shapes by unsolicited result code +CMOLRG: <location_parameters>. Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.</p> <p>3 Enables reporting of NMEA strings and GAD shapes by unsolicited result codes +CMOLRG: <location_parameters> and +CMOLRN: <NMEA-string>. Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.</p>
<method>	<p>0 Unassisted GPS. Autonomous GPS only, no use of assistance data.</p> <p>1 Assisted GPS. 2 Assisted GANSS. 3 Assisted GPS and GANSS. 4 Basic Self location (the network determines the position technology).</p> <p>5 Transfer to third party. This method makes the parameters <shape-rep> and <NMEA-rep> irrelevant (any values are accepted and disregarded). The third party address is given in the parameter <thirdparty-address>.</p> <p>6 Retrieval from third party. This method is to get the position estimate of the third party. The third party address is given in the parameter <third-party-address>.</p>
<hor-acc-set>	<p>0 Horizontal accuracy not set/specified.</p> <p>1 Horizontal accuracy set in parameter <hor-acc>.</p>
<hor-acc>	<p>Requested accuracy as horizontal uncertainty exponent. The value range is 0-127.</p>
<ver-req>	<p>0 Vertical coordinate (altitude) is not requested, 2D location fix is acceptable. The parameters <ver-accset> and <ver-acc> do not apply.</p> <p>1 Vertical coordinate (altitude) is requested, 3D location fix is required.</p>
<ver-acc-set>	<p>0 Vertical accuracy not set/specified.</p> <p>1 Vertical accuracy set/specified in parameter <ver-acc>.</p>
<ver-acc>	<p>Requested accuracy as vertical uncertainty exponent The value range is 0-127. The default value is implementation specific.</p>
<vel-req>	<p>0 Velocity not requested.</p> <p>1 Horizontal velocity requested.</p> <p>2 Horizontal velocity and vertical velocity requested.</p> <p>3 Horizontal velocity with uncertainty requested.</p> <p>4 Horizontal velocity with uncertainty and vertical velocity with uncertainty requested.</p>
<rep-mode>	<p>0 Single report, the timeout for the MO-LR response request is specified by <timeout>.</p>

	1 Periodic reporting, the timeout for each MO-LR response request is specified by <timeout> and the interval between each MO-LR is specified by <interval>.
<timeout>	Indicates how long the MS will wait for a response after a MO-LR. The value range is in seconds from 1 to 65535.
<interval>	The parameter is applicable to periodic reporting only. Determine the interval between periodic MO-LRs. The value range is in seconds from 1 to 65535, and must be greater than or equal to <timeout>.
<shape-req>	This parameter is a sum of integers each representing a certain GAD shape that will be accepted in the unsolicited result code <location_parameters>. Note that only one GAD shape is present per unsolicited result code. 1 Ellipsoid point. 2 Ellipsoid point with uncertainty circle. 4 Ellipsoid point with uncertainty ellipse. 8 Polygon. 16 Ellipsoid point with altitude. 32 Ellipsoid point with altitude and uncertainty ellipsoid. 64 Ellipsoid arc.
<plane>	The parameter specifies whether the control plane or SUPL will be used for MO-LR. 0 Control plane. 1 Secure user plane (SUPL).
<NMEA-rep>	The supported NMEA strings are specified as a comma separated values inside one string. If the parameter is omitted or an empty string is given, no restrictions apply and all NMEA strings are supported.
<third-party-address >	The parameter is applicable to reporting to third party only, and specifies the address to the third party. This parameter has to be specified when <method> value is set to 5 or 6.
<location-parameter s>	String type in UTF-8. This parameter provides XML-formatted strings of GADshape positioning data as defined in table 8.50-2. This parameter shall not be subject to conventional character conversion as per +CSCS. The XML according to the DTD in table 8.50-2 may be provided in one or multiple unsolicited result codes.

3.2.35 AT+CPWD Change Password

AT+CPWD Change Password	
Description	Command sets a new password for the facility lock function defined by command Facility Lock +CLCK. Test command returns a list of pairs which present the available facilities and the maximum length of their password.
Test Command AT+CPWD=?	Response +CPWD: list of supported (<fac>,<pwdlength>)s

	OK or +CME ERROR: <err>
Write Command AT+CPWD=<fac>,<old pwd>,<newpwd>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<fac>	"SC" SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)
<oldpwd>,<newpwd >	<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.

3.2.36 AT+CPINR Remaining PIN Retries

AT+CPINR Remaining PIN Retries

Description	<p>Execution command cause the MT to return the number of remaining PIN retries for the MT passwords with intermediate result code +CPINR: <code>,<retries>[,<default_retries>] for standard PINs and +CPINRE: <ext_code>,<retries>[,<default_retries>] for manufacturer specific PINs.</p> <p>One line with one intermediate result code is returned for every <code> or <ext_code> selected by <sel_code>.</p> <p>When execution command is issued without the optional parameter <sel_code>, intermediate result codes are returned for all <code>s and <ext_code>s.</p> <p>In the intermediate result codes, the parameter <default_retries> is an optional (manufacturer specific) parameter, per <code> and <ext_code>.</p>
Test Command AT+CPINR=?	Response OK
Write Command AT+CPINR[=<sel_code >]	Response [+CPINR:<code>,<retries>[,<default_retries>]][<CR>,<LF>+CPINR: <code>,<retries>[,<default_retries>]

	<p>OK</p> <p>If error is related to ME functionality: +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007 [13]	

Defined Values

<retries>	Integer type. Number of remaining retries per PIN.
<default_retries>	Integer type. Number of default/initial retries per PIN.
<code>	Type of PIN. All values listed under the description of the AT+CPIN command, <code> parameter, except 'READY'.
<ext_code>	Extended, manufacturer specific codes.
<sel_code>	String type. Same values as for the <code> and <ext_code> parameters. These values are strings and shall be indicated within double quotes. It is optional to support wildcard match by '*', meaning match any (sub-)string.

NOTE

Set and read could execute only when power on.

3.2.37 AT+CCHO Open Logical Channel

AT+CCHO Open Logical Channel

Description	<p>Execution of the command causes the MT to return <sessionid> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the <dfname> received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel.</p> <p>This <sessionid> is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands.</p> <p>NOTE: <i>The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 [65] for further information on</i></p>
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	<i>logical channels in APDU commands protocol.</i>
Write Command AT+CCHO=<dfname>	Response +CCHO: <sessionid> OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	

Defined Values

<dfname>	String type in hexadecimal character format. All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes
<sessionid>	Integer type; a session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism. See 3GPP TS 31.101 [65] for more information about defined values

3.2.38 AT+CCHC Close logical channel

AT+CCHC Close UICC Logical Channel

Description	This command asks the ME to close a communication session with the active UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command.
Write Command AT+CCHC=<sessionid>	Response OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	

Defined Values

<sessionid>	Integer type; the session used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism
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3.2.39 AT+CGLA Generic UICC Logical Channel Access

AT+CGLA Generic UICC Logical Channel Access

Description	<p>Set command transmits to the MT the <command> it then shall send as it is to the selected UICC. In the same manner the UICC <response> shall be sent back by the MT to the TA as it is.</p> <p>This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.</p> <p>Although Generic UICC Logical Channel Access command +CGLA allows TE to take control over the UICC-MT interface, there are some functions of the UICC-MT interface that logically do not need to be accessed from outside the TA/MT. Moreover, for security reason the GSM network authentication should not be handled outside the TA/MT. Therefore it shall not be allowed to execute a Run GSM Algorithm command or an Authenticate command in GSM context from the TE using +CGLA at all time whether the +CGLA is locked or unlocked. This shall not forbid the TE to send Authenticate commands in other security contexts (e.g. EAP security context).</p> <p>For example, the TA/MT shall forbid the transfer of the Authenticate command to a USIM application when parameters P2=0 (GSM security context). See 3GPP TS 31.102 [59] for USIM authenticate command definition.</p> <p>NOTE: Compared to Restricted UICC Access command +CRLA, the definition of +CGLA allows TE to take more control over the UICC-MT interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking.</p>
Write Command AT+CGLA=<sessionid>,<length>,<command>	<p>Response</p> <p>+CGLA: <length>,<response></p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	

Defined Values

<sessionid>	Integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to
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	the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").
<length>	Integer type; length of the characters that are sent to TE in <command> or <response>(two times the actual length of the command or response)
<command>	Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer +CSCS)
<response>	Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer +CSCS)

3.2.40 AT+CMTLR Mobile Terminated Location Request Notification

AT+CMTLR Mobile Terminated Location Request Notification	
Description	<p>Set command enables Mobile Terminated Location Request (MT-LR) notifications to the TE. The parameter <subscribe> enables or disables notification by an unsolicited result code. It is possible to enable notification of MT-LR performed over the control plane or over SUPL or both. Relevant location request parameters are provided in the unsolicited result code +CMTLR:<handle-id>,<notification-type>,<locationtype>,[<client-external-id>],[<client-name>],[<plane>].</p> <p>Read command returns the current value of <subscribe>.</p> <p>Test command returns the supported values as a compound value.</p>
Test Command AT+CMTLR=?	<p>Response</p> <p>+CMTLR: (list of supported <subscribe>s)</p> <p>OK</p>
Read Command AT+CMTLR?	<p>Response</p> <p>+CMTLR: <subscribe></p> <p>OK</p>
Write Command AT+CMTLR=<subscribe>	<p>Response</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<subscribe>	Enables and disables the subscription for MT-LR notifications 0 Disables reporting and positioning. 1 Subscribe for notifications of MT-LR over control plane. 2 Subscribe for notifications of MT-LR over SUPL. 3 Subscribe for notifications of MT-LR over control plane and SUPL.
<handle-id>	ID associated with each MT-LR used to distinguish specific request in case of multiple requests. The value range is 0-255.
<notification-type>	Integer type. Information about the user's privacy. 0 The subscription may stipulate that positioning the user by a third party is allowed and the network may choose to inform the user as a matter of courtesy. 1 Locating the user is permitted if the user ignores the notification. 2 Locating the user is forbidden if the user ignores the notification
<location-type>	Integer type. Indicates what type of the location is requested. 0 The current location. 1 The current or last known location. 2 The initial location.
<client-external-id>	String type. Indicates the external client where the location information is sent to (if required).
<client-name>	String type. Contains the string identifying the external client requesting the user's location
<plane>	Integer type. The parameter specifies whether the MT-LR came over control plane or SUPL. 0 Control plane. 1 Secure user plane (SUPL).

3.2.41 AT+CMTLRA Mobile Terminated Location Request Disclosure Allowance

AT+CMTLRA Mobile Terminated Location Request Disclosure Allowance	
Description	Set command allows or disallows disclosure of the location to the TE as a result of MT-LR by the parameter <allow>. Read command returns the current values. Test command returns the supported values.
Test Command AT+CMTLRA=?	Response +CMTLRA: (lists of supported <allow>values)
Read Command AT+CMTLRA?	Response +CMTLRA: <allow>,<handle-id>
Write Command	Response

AT+CMTLRA=<allow>, <handle-id>	OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<allow>	Integer type. Enables and disables the allowance for location disclosure. 0 Location disclosure allowed. 1 Location disclosure not allowed.
<handle-id>	Integer type. ID associated with each MT-LR used to distinguish specific request in case of multiple requests. The value range is 0-255.

3.2.42 AT+CRCES Reading Coverage Enhancement Status

AT+CRCES Reading Coverage Enhancement Status	
Description	This command returns the coverage enhancement status of the MT. The terminal can consider the coverage enhancement status prior to deciding to transmit data. Depending on the coverageenhancement status the terminal can refrain from transmitting data. The coverage enhancement status is only provided by the MT if the access technology of the serving cell is E-UTRAN, EC-GSM-IoT or E-UTRAN (NB-S1 mode). If the access technology of the serving cell is different, <Act>=0 is indicated.
Test Command AT+CRCES=?	Response OK
Execution Command AT+CRCES	Response +CRCES: <Act>,<CE_level>,<CC> OK
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<Act>	Integer type; access technology of the serving cell. 0 Location disclosure allowed.
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	<p>1 E-UTRAN. 2 EC-GSM-IoT (A/Gb mode) 3 E-UTRAN (NB-S1 mode)</p>
<CE_level>	<p>Integer type; Coverage Enhancement (CE) level of the MT in the serving cell. Applicable only if <Act>=1 (E-UTRAN) or <Act>=3 (E-UTRAN (NB-S1 mode)).</p> <p>0 No Coverage Enhancement in the serving cell 1 Coverage Enhancement level 0 2 Coverage Enhancement level 1 3 Coverage Enhancement level 2 4 Coverage Enhancement level 3</p>
<cc>	<p>Integer type; Coverage Class (CC) of the MT in the serving cell. Applicable only if <Act>=2 (EC-GSMIoT).</p> <p>0 No Coverage Class in the serving cell 1 Coverage Class 1 2 Coverage Class 2 3 Coverage Class 3 4 Coverage Class 4 5 Coverage Class 5.</p>

3.2.43 AT+CRSM Restricted SIM Access

AT+CRSM Restricted SIM Access	
Description	<p>By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM <command> and its required parameters. If a SIM installed in the currently selected card slot, the MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.</p> <p>Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation-dependent. However, the TE must be aware of the precedence of the GSM/UMTS application commands to the TE commands.</p>
Test Command AT+CRSM=?	<p>Response OK</p>
Write Command AT+CRSM=<Command>[,<fileId>[,<P1>,<P2>,<P3>[,<data>]]]	<p>Response +CRSM: <sw1>,<sw2>[,<response>]</p> <p>OK or</p>

	ERROR If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007	
GSM 11.11	

Defined Values

<Command>	(command passed on by the MT to the SIM; refer 3GPP TS 51.011 [28]): 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS All other values are reserved
<fileId>	Integer type; this is the identifier for an elementary data file on SIM. Mandatory for every Command except STATUS
<P1>,<P2>,<P3>	Integer type, range 0 – 255 Parameters to be passed on by the ME to the SIM; refer GSM 11.11.
<data>	Information which shall be written to the SIM (hex-decimal character format)
<sw1>,<sw2>	Integer type, range 0 - 255 Status 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; refer GSM 11.11.
<response>	Response of a successful completion of the Command previously issued (hexadecimal character format)

NOTE

<Command> does not support 203 and 219.

3.2.44 AT+CSIM Generic SIM Access

AT+CSIM Generic SIM Access

Description	Set command transmits to the MT the <command> it then shall send as it is to the SIM. In the same manner, the SIM <response> shall be sent back by the MT to the TA as it is.
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	<p>This command allows a direct control of the SIM that is installed in the currently selected card slot, by an distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS.</p> <p>NOTE: <i>Compared to Restricted SIM Access command +CRSM, the definition of +CSIM allows TE to take more control over the SIM-MT interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking.</i></p>
Test Command AT+CSIM=?	<p>Response</p> <p>OK</p>
Write Command AT+CSIM=<length>,<Command>	<p>Response</p> <p>+CSIM: <length>,<response></p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<length>	Integer type: length of characters sent to the TE in <Command> or <response> (i.e. twice the number of octets in the raw data).
<Command>	String type (string should be included in quotation marks): hex format: GSM 11.11 SIM Command sent from the ME to the SIM.
<response>	String type(string should be included in quotation marks): hex format: GSM 11.11 response from SIM to <Command>.

3.2.45 AT+CGDATA Enter Data State

AT+CGDATA Enter Data State	
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 Packet Domain PDP types. This may include performing a PS attach and one PDP context activations. <cid> should be specified (see the +CGDCONT) in order to provide the information needed for the context activation request.</p> <p>The test command is used for requesting information on the supported</p>

	<L2P> protocols.
Test Command AT+CGDATA=?	Response +CGDATA: (list of supported<L2P>s) OK
Write Command AT+CGDATA=[<L2P>[,<cid>[,<cid>[,...]]]]	Response OK or ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<L2P>	String type; indicates the layer 2 protocol to be used between the TE and MT. M-PT Eigencomm specified protocol – PDP Type, such as IP/IPV6/IPV4V6/Non-IP.
<cid>	Integer type; specifies a particular PDP context definition (see the +CGDCONT command).

NOTE

- This AT command is not fully followed the 3GPP 27.007, execution command just trigger MT to activate a PDP context, just same as: +CGACT=1,<cid>.The baud rate needs to be greater than or equal to 57600.
- If PDP activation success, MT issues the result code: OK, not: CONNECT, as not support V.250 online data state now.

3.2.46 AT+CCIOTOPT CloT Optimization Configuration

AT+CCIOTOPT CloT Optimization Configuration

Description	The set command controls which CloT EPS optimizations the UE indicates as supported and preferred in the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST messages. The command also allows reporting of the CloT EPS optimizations that are supported by the network. A UE supporting CloT functionality may support control plane CloT EPS optimization or user plane CloT EPS optimization or both (see 3GPP TS 24.301 [83], subclause 9.9.3.34). Based on the application characteristics
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	<p>the UE may prefer to be registered for control plane CloT EPS optimization or for user plane CloT EPS optimization (see 3GPP TS 24.301 [83], subclause 9.9.3.0B). Further the network may support control plane CloT EPS optimization or user plane CloT EPS optimization or both (see 3GPP TS 24.301 [83], subclause 9.9.3.12A).</p> <p>The set command is used also to control the unsolicited result code +CCIOTOPTI. An unsolicited result code +CCIOTOPTI: <supported_Network_opt> is used to indicate the supported CloT EPS optimizations by the network.</p> <p>current status of unsolicited result code +CCIOTOPTI.</p> <p>The test command returns values supported as compound values.</p>
<p>Test Command AT+CCIOTOPT=?</p>	<p>Response</p> <p>+CCIOTOPT: (list of supported <n>s),(list of supported <supported_UE_opt>s),(list of supported <preferred_UE_opt>s)</p> <p>OK</p>
<p>Read Command AT+CCIOTOPT?</p>	<p>Response</p> <p>+CCIOTOPT: <n>,<supported_UE_opt>,<preferred_UE_opt></p> <p>OK</p> <p>If error is related to ME functionality: +CME ERROR: <err></p>
<p>Write Command AT+CCIOTOPT=[<n>[,<supported_UE_opt>[,<preferred_UE_opt>]]]</p>	<p>Response</p> <p>OK</p> <p>If error is related to ME functionality: +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007 [13]

Defined Values

<n>	<p>Integer type. Enables or disables reporting of unsolicited result code +CCIOTOPTI.</p> <p><u>0</u> Disable reporting.</p> <p><u>1</u> Enable reporting.</p> <p><u>3</u> Disable reporting and reset the parameters for CloT EPS optimization to the default values.</p>
<supported_UE_opt>	<p>Integer type; indicates the UE's support for CloT EPS optimizations.</p> <p><u>0</u> No support.</p> <p><u>1</u> Support for control plane CloT EPS optimization.</p> <p><u>2</u> Support for user plane CloT EPS optimization.</p>

	3 Support for both control plane CloT EPS optimization and user plane CloT EPS optimization.
<preferred_UE_opt>	Integer type; indicates the UE's preference for CloT EPS optimizations. 0 No preference. 1 Preference for control plane CloT EPS optimization. 2 Preference for user plane CloT EPS optimization.
<supported_Network_opt>	Integer type; indicates the Network support for CloT EPS optimizations. 0 No support. 1 Support for control plane CloT EPS optimization. 2 Support for user plane CloT EPS optimization. 3 Support for both control plane CloT EPS optimization and user plane CloT EPS optimization.

Example

AT+CCIOTOPT=?

+CCIOTOPT: (0,1,3),(1,3),(0,1,2)

OK

AT+CCIOTOPT?

+CCIOTOPT: 0,1,1

OK

3.2.47 AT+CGCMOD PDP Context Modify

AT+CGCMOD PDP Context Modify

Description	<p>The execution command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs.</p> <p>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. Refer to Chapter 9: Error Values for possible <err> values. 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 <cid>s are specified the activation form of the command modifies all active contexts. The test command returns a list of <cid>s associated with active contexts</p>
Test Command	Response

AT+CGCMOD=?	+CGCMOD: (list of <cid>s associated with active contexts)
	OK
Write Command AT+CGCMOD[=<cid>[,<cid>[,...]]]	Response OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007 [13]	

Defined Values

<cid>	Integer type; specifies a particular PDP context definition (see the +CGDCONT command).
-------	---

NOTE

- Could only modify one cid one time.
- Will block other commands when processing.

3.2.48 AT+CGEQOS Define EPS Quality of Service

AT+CGEQOS Define EPS Quality ofService	
Description	<p>The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] for a PDP context or Traffic Flows (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. Refer to Chapter 9: Error Values for possible <err> values.</p> <p>A special form of the set command, +CGEQOS=<cid> causes the values for context number <cid> to become undefined.</p> <p>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>
Test Command AT+CGEQOS=?	Response +CGEQOS: (range of supported <cid>s),(list of supported <QCI>s)

	OK
Read Command AT+CGEQOS?	Response [+CGEQOS: <cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>]]<CR><LF> +CGEQOS: <cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>] [...]]
Write Command AT+CGEQOS=[<cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>]]]	OK If error is related to ME functionality: +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	
3GPP TS 27.007 [13]	

Defined Values

<cid>	Integer type; specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT command).
<QCI>	Integer type; specifies a class of EPS QoS 0 QCI is selected by network [1-4] Value range for guaranteed bit rate Traffic Flows 75 Value for guaranteed bit rate Traffic Flows [5-9] Value range for non-guaranteed bit rate Traffic Flows 79 Value for non-guaranteed bit rate Traffic Flows
<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]).

3.2.49 AT+CGEQOSRDP EPS Quality of Service Read Dynamic Parameters

AT+CGEQOSRDP EPS Quality of Service Read Dynamic Parameters

Description	<p>The execution command returns the quality of service parameters <QCI>,[<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] of the active secondary or non-secondary PDP context associated to the provided context identifier <cid>.</p> <p>If the parameter <cid> 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 <cid>s associated with secondary or non-secondary active PDP contexts</p>
Test Command AT+CGEQOSRDP=?	<p>Response</p> <p>+CGEQOSRDP: (list of <cid>s)</p> <p>OK</p>
Write Command AT+CGEQOSRDP [=<cid>]	<p>Response</p> <p>+CGEQOSRDP: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<DL_A MBR>,<UL_AMBR>] [<CR><LF>+CGEQOSRDP: <cid>,<QCI>,[<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>][<DL_A MBR>,<UL_AMBR>] [...]]</p> <p>OK</p> <p>If error is related to ME functionality: +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference 3GPP TS 27.007 [13]	

Defined Values

<cid>	Integer type; specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT command).
<QCI>	<p>Integer type; specifies a class of EPS QoS (see 3GPP TS 23.203 [85] and 3GPP TS 24.301 [83]).</p> <p>0 QCI is selected by network</p> <p>[1 – 4] value range for guaranteed bit rate Traffic Flows</p> <p>75 value for guaranteed bit rate Traffic Flows</p> <p>[5 – 9] value range for non-guarenteed bit rate Traffic Flows</p> <p>79 value for non-guaranteed bit rate Traffic Flows</p> <p>[128 – 254] value range for Operator-specific QCIs</p> <p>The QCI values 65, 66, 69 and 70 are not allowed to be requested by the UE. If the TE requests a QCI parameter 65, 66, 69 or 70, the MT responds with</p>

	result code +CME ERROR: 181 (unsupported QCI value).
<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]).
<DL_AMBR>	Integer type; indicates DL APN aggregate MBR. The value is in kbit/s.
<UL_AMBR>	Integer type; indicates UL APN aggregate MBR. The value is in kbit/s.

NOTE

- Could set <QCI> only and only <QCI>=0 & 5 & 6 & 7 & 8 & 9 & 79 are supported.
- Could execute only when power on and pdp context defined.

3.2.50 AT+CGTFT Traffic Flow Template

AT+CGTFT Traffic Flow Template

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 command, 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. Refer to Chapter 9 for possible <err> values.

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.

Test Command
AT+CGTFT=?

Response

+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

Read Command
AT+CGTFT?

Response

[+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>
[...]

(ipv6)>	
<local port range>	String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<remote port range>	String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec security parameter index (spi)>	Numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	String type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<direction>	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)
<local address and subnet mask>	String type. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6. When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.
	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].

NOTE

- Could execute only when power on and PDP context defined.
- <local address and subnet mask> is not supported yet.

3.2.51 AT+IPR Set UE Baud Rate

AT+IPR Set UE Baud Rate

Description	Set command sets the UE baud rate to be used. Read command returns the current baud rate. Test command returns baud rates supported by the UE.
Test Command AT+IPR=?	Response +IPR:(list of supported auto detectable<rate> values),(list of fixed-only<rate>values)
Read Command AT+IPR?	Response +IPR:<rate>
Write Command AT+IPR=<rate>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<rate>	Baud rate at which the UE will accept commands.
---------------------	---

NOTE

If <rate> is 0 for set command, UE will enter auto baud rate detection mode and 'AT' or 'at' shall be sent for baud rate detection.

The default baudrate set is 0 and it is adaptive. The baudrate auto-adaptation only applies to the first data transmission. To continue using the adaptive function, send AT+IPR=0.

3.2.52 AT+SIMEI Set the IMEI for the module

This command is used to set the module's IMEI value.

AT+SIMEI Set the IMEI for the module

Test Command AT+SIMEI=?	Response OK
Read Command AT+SIMEI?	Response 1) +SIMEI: <imei> 2) OK 3) ERROR
Write Command AT+SIMEI=<imei>	Response 1) OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	Vendor

Defined Values

<imei>	The 15-digit IMEI value.
--------	--------------------------

Examples

```

AT+SIMEI=?
OK
AT+SIMEI?
+SIMEI: 357396012183175

OK
AT+SIMEI=357396012183175
OK

```

3.2.53 AT+COPN Read operator names

This command is used to return the list of operator names from the ME. Each operator code <numericX> that has an alphanumeric equivalent <alphaX> in the ME memory shall be returned.

AT+COPN Read operator names

Test Command AT+COPN=?	Response 1) OK 2) ERROR
Execution Command AT+COPN	Response 1) +COPN: <numeric1>,<alpha1>[<CR><LF><CR><LF> +COPN: <numeric2>,<alpha2> [..] OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<numericX>	String type, operator in numeric format (see AT+COPS).
<alphaX>	String type, operator in long alphanumeric format (see AT+COPS).

Examples

```
AT+COPN=?
OK
AT+COPN
+COPN: "46000","CMCC"

+COPN: "46001","UNICOM"
.....
OK
```

3.2.54 AT+CNBP Preferred band selection

This command is used to select or set the state of the band preference.

AT+CNBP Preferred band selection	
Test Command AT+CNBP=?	Response 1) +CNBP: (list of supported <band>s) OK 2) ERROR
Read Command AT+CNBP?	Response +CNBP: <lte_mode> OK
Write Command AT+CNBP=<lte_mode>	Response 1) OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9000ms
Reference	3GPP TS 27.007

Defined Values

<band>	Band list in decimal number, the default value is decided by RF Calibration table
<lte_mode>	64 bit number, the value is "1" << "<lte_pos>", then or by bit. NOTE: FDD(band1 ~ band32), TDD(band33 ~ band42)
<lte_pos>	Value: 0x000007FF3FDF3FFF Any (any value) 0 EUTRAN_BAND1(UL:1920-1980; DL:2110-2170) 1 EUTRAN_BAND2(UL:1850-1910; DL:1930-1990) 2 EUTRAN_BAND3(UL:1710-1785; DL:1805-1880) 3 EUTRAN_BAND4(UL:1710-1755; DL:2110-2155) 4 EUTRAN_BAND5(UL: 824-849; DL: 869-894) 5 EUTRAN_BAND6(UL: 830-840; DL: 875-885) 6 EUTRAN_BAND7(UL:2500-2570; DL:2620-2690) 7 EUTRAN_BAND8(UL: 880-915; DL: 925-960) 8 EUTRAN_BAND9(UL:1749.9-1784.9; DL:1844.9-1879.9) 9 EUTRAN_BAND10(UL:1710-1770; DL:2110-2170)

- 10 EUTRAN_BAND11(UL:1427.9-1452.9; DL:1475.9-1500.9)
- 11 EUTRAN_BAND12(UL:698-716; DL:728-746)
- 12 EUTRAN_BAND13(UL: 777-787; DL: 746-756)
- 13 EUTRAN_BAND14(UL: 788-798; DL: 758-768)
- 16 EUTRAN_BAND17(UL: 704-716; DL: 734-746)
- 17 EUTRAN_BAND18(UL: 815-830; DL: 860-875)
- 18 EUTRAN_BAND19(UL: 830-845; DL: 875-890)
- 19 EUTRAN_BAND20(UL: 832-862; DL: 791-821)
- 20 EUTRAN_BAND21(UL:1447.9-1462.9; DL: 1495.9-1510.9)
- 22 EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200)
- 23 EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559)
- 24 EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995)
- 25 EUTRAN_BAND26(UL: 814-849; DL: 859 -894)
- 26 EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869)
- 27 EUTRAN_BAND28(703-748; DL: 758-803)
- 28 EUTRAN_BAND29(UL:1850-1910 or 1710-1755;
DL:716-728)
- 29 EUTRAN_BAND30(UL: 2305-2315 ; DL: 2350 - 2360)
- 32 EUTRAN_BAND33(UL: 1900-1920; DL: 1900-1920)
- 33 EUTRAN_BAND34(UL: 2010-2025; DL: 2010-2025)
- 34 EUTRAN_BAND35(UL: 1850-1910; DL: 1850-1910)
- 35 EUTRAN_BAND36(UL: 1930-1990; DL: 1930-1990)
- 36 EUTRAN_BAND37(UL: 1910-1930; DL: 1910-1930)
- 37 EUTRAN_BAND38(UL: 2570-2620; DL: 2570-2620)
- 38 EUTRAN_BAND39(UL: 1880-1920; DL: 1880-1920)
- 39 EUTRAN_BAND40(UL: 2300-2400; DL: 2300-2400)
- 40 EUTRAN_BAND41(UL: 2496-2690; DL: 2496-2690)
- 41 EUTRAN_BAND42(UL: 3400-3600; DL: 3400-3600)
- 42 EUTRAN_BAND43(UL: 3600-3800; DL: 3600-3800)

Examples

AT+CNBP=?

+CNBP: (1,3,5,8,38,40,41)

OK

AT+CNBP?

+CNBP: 0X0002000000400180

OK

AT+CNBP=0X0002000000400180

OK

3.2.55 AT+CPSI Inquiring UE system information

This command is used to return the UE system information.

AT+CPSI Inquiring UE system information

<p>Test Command AT+CPSI=?</p>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p>
<p>Read Command AT+CPSI?</p>	<p>Response</p> <p>1)If camping on a gsm cell: +CPSI: <System Mode>,<Operation Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Absolute RF Ch Num>,<RxLev>,<Track LO Adjust>,<C1-C2></p> <p>OK</p> <p>2)If camping on a wcdma cell: +CPSI: <System Mode>,<Operation Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Frequency Band>,<PSC>,<Freq>,<SSC>,<EC/IO>,<RSCP>,<Qual>,<RxLev>,<TXPWR></p> <p>OK</p> <p>3)If camping on a lte cell: +CPSI: <System Mode>,<Operation Mode>[,<MCC>-<MNC>,<TA C>,<SCellID>,<PCellID>,<Frequency Band>,<earfcn>,<dlbw>,<ulbw>,<RSRQ>,<RSRP>,<RSSI>,<RSSNR>]</p> <p>OK</p> <p>4)If no service: +CPSI: NO SERVICE, Low Power Mode</p> <p>OK</p> <p>5) ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>9000ms</p>
<p>Reference</p>	<p>3GPP TS 27.007</p>

Defined Values

<System Mode>	System mode, values: "NO SERVICE", "GSM", "WCDMA", "LTE", "NB"
---------------	--

<Operation Mode>	UE operation mode, values: "Unknown", "Online", "Offline", "Factory Test Mode", "Reset", "Low Power Mode", "Flight Mode".
<MCC>	Mobile Country Code (first part of the PLMN code)
<MNC>	Mobile Network Code (second part of the PLMN code)
<LAC>	Location Area Code (hexadecimal digits)
<Cell ID>	Service-cell Identify.
<Absolute RF Ch Num>	AFRCN for service-cell.
<Track LO Adjust>	Track LO Adjust
<C1>	Coefficient for base station selection
<C2>	Coefficient for Cell re-selection
<Frequency Band>	Frequency Band of active set
<PSC>	Primary synchronization code of active set.
<Freq>	Downlink frequency of active set.
<SSC>	Secondary synchronization code of active set
<EC/IO>	Ec/Io value
<RSCP>	Received Signal Code Power
<Qual>	Quality value for base station selection
<RxLev>	RX level value for base station selection
<TXPWR>	UE TX power in dBm. If no TX, the value is 500.
<Cpid>	Cell Parameter ID
<TAC>	Tracing Area Code
<PCellID>	Physical Cell ID
<earfcn>	E-UTRA absolute radio frequency channel number for searching LTE cells
<dlbw>	Transmission bandwidth configuration of the serving cell on the downlink
<ulbw>	Transmission bandwidth configuration of the serving cell on the uplink
<RSRP>	Current reference signal received power in -1/10 dBm. Available for LTE
<RSRQ>	Current reference signal receive quality as measured by L1.
<RSSNR>	Average reference signal signal-to-noise ratio of the serving cell
<SCellID>	String type. cell ID in decimal format for serving cell
<RSSI>	Number format. Received signal strength indication.

Examples

AT+CPSI?

+CPSI:

LTE,Online,460-01,0x230A,175499523,318,EUTRAN-BAND3,1650,5,0,21,67,255,19

OK

3.2.56 AT+CGDSCONT Define Secondary PDP Context

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local)context identification parameter,<cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the set command, AT+CGDSCONT=<cid> causes the values for context number <cid> to become undefined.

AT+CGDSCONT Define Secondary PDP Context

<p>Test Command AT+CGDSCONT=?</p>	<p>Response 1) +CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts) OK 2) ERROR</p>
<p>Read Command AT+CGDSCONT?</p>	<p>Response 1) +CGDSCONT: [<cid>,<p_cid>,<d_comp>,<h_comp> [<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp> [.]]] OK 2) ERROR</p>
<p>Write Command AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>]]]</p>	<p>Response 1) OK 2) ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>9000ms</p>
<p>Reference</p>	<p>3GPP TS 27.007</p>

Defined Values

<cid>	a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1)is returned by the test form of the command. NOTE: The <cid>s for network-initiated PDP contexts have values outside the ranges activated by the +CGACT.
<p_cid>	a numeric parameter which specifies a particular PDP context

	definition which has been specified by use of the +CGDSCONT command and activated by the +CGACT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.
<PDP_type>	(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<d_comp>	a numeric parameter that controls PDP data compression (applicable for SNDCPonly)(refer 3GPP TS 44.065 [61]) 0 off 1 on (manufacturer preferred compression) 2 V.42bis Other values are reserved.
<h_comp>	a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]) 0 off 1 RFC1144 Other values are reserved.

Examples

AT+CGDSCONT=?

+CGDSCONT: (0-10),(0-10)

OK

AT+CGDSCONT?

+CGDSCONT:

OK

AT+CGDSCONT=4,2

+CME ERROR: operation not supported

3.2.57 AT+CICCID Read ICCID from SIM card

This command is used to Read the ICCID from SIM card.

AT+CICCID Read ICCID from SIM card

Test Command	Response
AT+CICCID=?	OK
Execution Command	Response

AT+CICCID	1) +ICCID: <ICCID> OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	Vendor

Defined Values

<ICCID>	Integrate circuit card identity, a standard ICCID is a 20-digit serial number of the SIM card, it presents the publish state, network code, publish area, publish date, publish manufacture and press serial number of the SIM card.
----------------------	--

Examples

```

AT+CICCID
+ICCID: 89860318760238610932

OK
AT+CICCID=?
OK
  
```

3.2.58 AT+SPIC Times remain to input SIM PIN/PUK

This command is used to inquire times remain to input SIM PIN/PUK.

AT+SPIC Times remain to input SIM PIN/PUK	
Test Command AT+SPIC=?	Response OK
Execution Command AT+SPIC	Response +SPIC: <pin1>,<puk1>,<pin2>,<puk2> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference

Vendor

Defined Values

<pin1>	Times remain to input PIN1 code.
<puk1>	Times remain to input PUK1 code.
<pin2>	Times remain to input PIN2 code.
<puk2>	Times remain to input PUK2 code.

Examples

```
AT+SPIC=?  
OK  
AT+SPIC  
+SPIC: 3,10,0,10  
OK
```

4 AT Command for General Commands

4.1 Overview of AT Commands for General

Command	Description
AT+QCBAND	Set Supported Network and Bands.
AT+QCLOGDBVER	Database Version Information.
AT+QCCFG	UE Extended Configuration
AT+QCPING	Test IP Network Connectivity to a Remote Host
AT+QCFREQ	Lock or Unlock Cell
AT+QCRMFPLMN	Remove FPLMN in NVM or SIM
AT+QCATTBEARER	Configure the PDN Info Request to Establish.
AT+QCSSENDATA	Send Data Via Control Plane or User Plane
+RECVNONIP	Indicate Downlink NON-IP Data.
AT+QCPMUCFG	Set PMU mode
AT+QCSMSEND	Send one SMS
AT+QCCGSN	Sets the IMEI and SN
AT+QCRFSTAT	Shows the Status of RF Calibration
AT+QCRST	Restart the Chip
AT+QCPSMR	Report the Power Saving Mode Status
AT+QCPLMNS	Used to trigger a PLMN
AT+QCCESQS	Controls the Extended Signal Quality Change Event Reporting
AT+QCSTATUS	Returns Some Key Parameter in UE Side
AT+QCICCID	Causes the TA to Return the ICCID of the UICC
AT+QCBCINFO	Return the Basic Serving Cell Information
AT+QCDNS	Get the IP Address for a Specific URL
AT+QCDNSCFG	Set the Default DNS Addresses Configuration
AT+QCEMMTIME	Report and Get the Emm Time State
AT+CPCFG	Set Plat Configure
AT+QCSLEEP	Power Consumption Test
AT+QCSIMSLEEP	Set UE to Allow SIM Card Sleep for Power Consumption
AT+QCCGSNLOCK	Set Lock Flag for IMEI and SN
AT+QCSAVEFAC	Saves Related Regions to Default Reliable Region
AT+QCTASKINFO	Returns All the Task's Information
AT+QCTASKHISTINFO	Shows Most Recent Tasks' Scheduling History

AT+QCSHOWMEM	Shows Current Heap Memory Usage
AT+QCSYSTEST	Triggers a Test Feature
AT+QCVOTECHK	Analyze the Reason of Sleep Failure
AT+QCURC	Close/Open URC Report
AT+QCPTWEDRXS	Control Whether the UE
+QCPIN	Indicate SIM PIN State
+QCPCFUN	
+QCPADDR	Print PDP Address
AT+QCADC	Read ADC
AT+QCSWC	Set the UE Operation SIM Counter
AT+QCIPR	Operate the Baud Rate of UE
AT+CNPICFG	Operating NPI
AT+QCPRDMODE	Control NPI production mode
AT+QCLEDMODE	Enable the Netlight Function
AT+QCPOWERCLASS	Sets the Band Power Class

4.2 Detailed Descriptions of Commands

4.2.1 AT+QCBAND Set Supported Network and Bands

AT+QCBAND Set Supported Network and Bands	
Description	The command sets the network mode and bands to be used.
Test Command AT+QCBAND=?	Response +QCBAND: (list of supported<mode>s),(list of supported<band>s) OK
Read Command AT+QCBAND?	Response +QCBAND: <mode>,<band1>,<band2>,... OK
Write Command AT+QCBAND=<mode> [,<band1>[,<band2>...]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 NB-IOT mode(current support NB-IoT only)
<band>	Band list in decimal number: <band> values of 1,2,3,4,5,8,12,13,14,17,18,19,20,25,26,28,66,70,85 is supported.

Examples

AT+QCBAND=?	Query support band
+QCBAND: (0),(1,2,3,4,5,8,12,13,14,17,18,19,20,25,26,28,66,70,85)	
OK	
AT+QCBAND?	Query default band
+QCBAND: 0,5,8,1,3,20	
OK	
AT+QCBAND=0,5,8,1,3,20,28	Set default band
OK	

4.2.2 AT+QCLOGDBVER Database Version Information

AT+QCLOGDBVER Database Version Information	
Description	This read command returns current unilog database version information.
Read Command AT+QCLOGDBVER?	Response +QCLOGDBVER: <LogDbVserion> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

4.2.3 AT+QCCFG UE Extended Configuration

AT+QCCFG UE Extended Configuration	
Description	The command set UE extended configuration. The read command return current setting of each parameters. The test command returns values supported as a compound value.

Test Command AT+QCCFG=?	Response +QCCFG: (list of supported<param>s) OK
Read Command AT+QCCFG?	Response +QCCFG: <param1>,<value1>,<param2>,<value2>...<paramN>,<valueN> OK
Write Command AT+QCCFG=<param1> ,<value1>[,<param2>,<value2>[,<param3>,<value3>,[...]]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	-
Reference	

Defined Values

<param>	
"AutoApn"	Whether UE auto set the attached APN according to the inserted SIM card. Supported values: (0,1)
<PsSoftReset>	Whether UE support protocol stack soft reset. Supported values: (0,1)
"UsimPowerSave"	Enable/disable USIM power save. Supported values: (0,1)
"UsimSimulator"	Enable/disable virtual SIM card for instrument test, such as CMW500. Supported values: (0,1)
"SimBip"	Enable/disable USIM Bearer Independent Protocol Supported values: (0,1)
"Rohc"	Whether UE support ROHC. Supported values: (0,1)
"Ipv6RsDelay"	Delay in seconds then UE trigger IPv6 NDP (RS) procedure to get IPv6 prefix address. Supported values: (0-65535), Default value: 15
"PowerCfun"	Default CFUN state after UE power-on or reboot; Supported values: (0,1,4) a) If set to 0, UE remain CFUN0 state (neither turn on protocol/RF nor SIM) after power-on or reboot; And could turn on protocol/RF and SIM via AT+CFUN=1 b) If set to 1, UE auto turn on protocol, and connect the network after power-on or reboot; c) If set to 4, UE only turn on SIM, disable (turn off) protocol/RF, after power-on or reboot;
"PsPowerOnMaxDelay"	Max delay in seconds after power on, UE will delay in a random value between 0 to max delay value.

	Supported values: (0-65535)
"SupportSms"	Whether UE support SMS. Supported values: (0,1)
"TauForSms"	Whether need to trigger TAU procedure, if UE support SMS capability, while NW not support. Supported values: (0,1)
"PlmnSearchPowerLevel"	Set the PLMN search level when UE OOS; Supported values: (0,1,2,3) 0 - OOS PLMN search interval: 30 sec, 1 min, 2 min 1 - OOS PLMN search interval: 5 min, 10 min, 15 min 2 - OOS PLMN search interval: 10 min, 30 min, 1 hour 3 - OOS PLMN search interval: 30 sec, then stop PLMN search, and let AT: AT+QCPLMNS to start PLMN search
"EpcO"	Whether UE need to use "EPCO" in "PDN CONNECTION REQUEST" carried in "ATTACH REQUEST", and "ESM INFORMATION RESPONSE"; If set to 0, just use "PCO". Supported values: (0,1)
"T3324MaxValueS"	Set user control T3324 value in second. Support values: (0-0xFFFFFFFF) a) If T3324MaxValues is smaller than 0xFFFF and network configured T3324 is equal to or greater than T3324MaxValues (or network not configured T3324), use the configured T3324MaxValues b) If T3324MaxValues is smaller than 0xFFFF and network configured T3324 is smaller than T3324MaxValues, use the network configured value c) If T3324MaxValues is equal to or greater than 0xFFFF, just means disable this feature (use network configured value)
"MultiCarrier"	Whether UE support multi-carrier feature. Support values: (0,1)
"MultiTone"	Whether UE support multi-tone feature. Support values: (0,1)
"SupportUpRai"	Whether UE support L2 (MAC layer) RAI feature, which only valid whether set to R14 version. Supported values: (0,1)
"DataInactTimer"	Set the value of "data inactivity timer" in seconds, if this timer is not configured by NW (in MAC-MainConfig-NB), just use this setting value. Supported value: (0,40-254) a) Default value: 60 b) If set to 0, just means this timer is invalid, don't need to start.
"RelaxMonitorDeltaP"	Set the value of "SearchDeltaP" in DB for RelaxMonitor feature. If this value is not configured by NW (in SIB-NB), just use this setting value. Supported values: (0-15). Default value: 0.
"DisableNCellMeas"	Whether UE support NCell measuring feature. Supported values: (0,1)
"NbCategory"	Set the value of NB-IOT category. Supported values: (1,2)
"RelVersion"	Set the NB release version. Supported values: (13,14)
"Ipv6RsForTestSim"	Whether UE trigger IPv6 NDP (RS) procedure to get IPv6 prefix address, when the SIM card inserted is a TEST SIM. Supported values: (0,1) Default value 0. IPv6 NDP (RS) procedure is triggered by default if the inserted SIM card is not for testing.
<CellSearchGuardTimer>	Cell Search Guard Timer. Supported values: (0,65535) Default value: 1200

<EnableHPPImnSearch>	Whether UE support EnableHPPImnSearch. Supported values: (0,1)
<overrideLrplmnsi>	Whether UE support overrideLrplmnsi NOTE: Supported values: (0, 1)
<CpReestablishment>	Whether UE support CpReestablishment. Supported values: (0,1)
<SupportMultiCarrierPaging>	Whether UE support SupportMultiCarrierPaging. Supported values: (0,1)
<SupportMultiCarrierNPRACH>	Whether UE support SupportMultiCarrierNPRACH. Supported values: (0,1)
<SupportTwoHarq>	Whether UE support SupportTwoHarq. Supported values: (0,1)
<InterferenceRandomisation_r14>	Whether UE support InterferenceRandomisation_r14. Note: a) Supported values: (0,1) b) Default value: 1
<DataInactMon_r14>	Whether UE support DataInactMon_r14. Note: a) Supported values: (0,1) b) Default value: 1
<bTcpOpt>	whether enable TCP throughput optimization. Supported values: (0,1)
<value>	Value of configuration.

NOTE

Some Parameters must be restricted to execute in the CFUN0 or CFUN4 state.

4.2.4 AT+QCPING Test IP Network Connectivity to a Remote Host

AT+QCPING Test IP Network Connectivity to a Remote Host

Description	The command sends an ICMP packet to the specified host address. AT+QCPING initiates the sending of a PING packet with payload size: <size> to the specified address. This will either cause a packet to be returned if the remote system is connected and responding to PING packets or no response will be received. If none of the response packet received within the timeout period <timeout>. It will continue to send PING packet until the <count> number of times.
Test Command AT+QCPING=?	Response +QCPING: (list of supported<ipaddr/Url/mode>s),(list of supported<count> s),(list of supported <size>s),(list of supported<timeout>s),(list of supported <rai_flag>s)

	OK
Write Command AT+QCPING=[<ipaddr/Url>/<mode>[,<count>[,<size>[,<timeout>][,rai_enable]]]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Stop ping
<ipaddr/Url>	String type, IP address or URL
<count>	ping times: 1-255 default value: 4. 255 means all the time Note: default value: 4, 255 means all the time
<size>	Payload size: 1-1500 default value: 32.
<timeout>	UE ping reply timeout after ping request (ms). <timeout> values between 1 to 600000 are supported, and default value: 20000.
<rai_enable>	Integer type, if the value is 1, UE will send the last ping request packet with RAI indication 0-1 Note: default value: 0
<cause>	0 ping succ, and ping done 1 One ping is succ, and maybe ping is still ongoing 2 One ping is fail, and maybe ping is still ongoing 3 One ping send fail 4 input parameters error 5 DNS failed 6 socket error

NOTE

- When one PING reply received in <timeout>, an unsolicited result code: +QCPING: SUCC, dest: <dest_ip_addr>, RTT: <rtt_time>ms will sent to TE..
- If no PING reply received in <timeout>, an unsolicited result code: +QCPING: FAIL, dest: <dest_ip_addr>, time out: <timeout>ms will sent to TE.
- If this is an ERROR meet during PING procedure, an unsolicited result code: +QCPING: ERROR, cause: <cause>
- When PING procedure is done, an unsolicited result code: +QCPING: DONE<CR><LF>+QCPING: dest: <dest_ip_addr>, <count> packets transmittted, <reply_count> received, <lost_percent>% packet loss<CR> rtt min/avg/max = <rtt_min> / <rtt_avg> /<rtt_max> ms will send to TE.

4.2.5 AT+QCFREQ Lock or Unlock Cell

AT+QCFREQ Lock or Unlock Cell	
Description	The command set prefer EARFCN list, lock or unlock cell.
Test Command AT+QCFREQ=?	Response +QCFREQ: (list of supported<mode>s) OK
Read Command AT+QCFREQ?	Response If neither set prefer EARFCN list nor lock EARFCN/cell : OK If set prefer EARFCN list: +QCFREQ: <1>,<arfcn1>,<arfcn2>,... If lock EARFCN or lock cell: +QCFREQ: <2>,<arfcn>,<phyCellId> OK If both set prefer EARFCN list and lock EARFCN/cell: +QCFREQ: <1>,<arfcn1>,<arfcn2>,... +QCFREQ: <2>,<arfcn>,<phyCellId> OK
Write Command AT+QCFREQ=<mode> (mode=0) AT+QCFREQ=<mode>[<earfcn1>[,<earfcn2> ...]](mode=1) AT+QCFREQ=<mode>, <earfcn>[,<phyCellId>] (mode2)	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Cancel cell lock 1 Set prefer EARFCN list
---------------------	--

	2 EARFCN lock, or cell lock 3 Clear prefer EARFCN
<earfcn>	E-UTRA Absolute Radio Frequency Channel Number
<phyCellId>	Physical cell ID

NOTE

AT+QCFREQ must be restricted to execute in power off or air plane state.

4.2.6 AT+QCRMFPLMN Remove FPLMN in NVM or SIM

AT+QCRMFPLMN Remove FPLMN in NVM or SIM

Description	Set command remove FPLMN in NVM or SIM.
Test Command AT+QCRMFPLMN=?	Response +QCRMFPLMN: (list of supported<mode>s) OK
Write Command AT+QCRMFPLMN=<mode>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Remove FPLMN in NVM file and in SIM card 1 Remove FPLMN in NVM file 2 Remove FPLMN in SIM card
--------	--

4.2.7 AT+QCATTBEARER Configure the PDN Info Request to Establish

AT+QCATTBEARER Configure the PDN Info Request to Establish

Description	<p>The set command is used to configure the PDN info request to establish during the attach process, if attach with PDN required.</p> <p>The read command is used to obtain the configuration of the PDN info request to establish during the attach process.</p> <p>The test command returns values supported as a compound value.</p>
Test Command AT+QCATTBEARER=?	<p>Response</p> <p>+QCATTBEARER: (list of supported<PDP_type>s),(list of supported <eif>s),(list of supported<IPv4AddrAlloc>s),(list of supported<NSLPI>s),(list of supported<IPv4_MTU_discovery>s),(list of supported<NonIP_MTU_discovery>s),(list of supported<auth_proto>s),((userId string),(password string)</p> <p>OK</p>
Read Command AT+QCATTBEARER?	<p>Response</p> <p>+QCATTBEARER:<pdnType>,<eif>,<apnStr>,<ipv4allocType>,<NSLPI >,<ipv4Mtu>,<nonIpMtu>,<auth_proto>,<userId>,<password></p> <p>OK</p>
Write Command AT+QCATTBEARER=<PDP_type>[,<eif>[,<apn>[,<IPv4AddrAlloc>[,<NSLPI>[,<IPv4_MTU_discovery>[,<NonIP_MTU_discovery>[,<auth_proto>[,<userId>,<password>]>]]]]]]]	<p>Response</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<PDP_type>	1 IPv4 2 IPv6 3 IPv4v6 5 NON IP
<eif>	0 Security protected ESM information transfer not required 1 Security protected ESM information transfer required
<apn>	Apn string, the max length is 99 characters;
<IPv4AddrAlloc>	0 IPv4 address allocate through NAS signaling 1 IPv4 address allocate through DHCP (not applicable)
<NSLPI>	0 indicates that this PDP context is to be activated with the value for the low

	priority indicator configured in the MT. 1 indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signaling low priority".
<IPv4_MTU_discovery>	0 IPv4 MTU size discovery not influenced by +QCATTBEARER 1 IPv4 MTU size discovery through NAS signaling
<NonIP_MTU_discovery>	0 Non-IP MTU size discovery not influenced by +QCATTBEARER 1 Non-IP MTU size discovery through NAS signaling
<auth_proto>	0 None. Used to indicate that no authentication protocol is used for this PDP 1 PAP
<userid>	userId string, the max length is 20 characters;
<password>	password string, the max length is 20 characters;

4.2.8 AT+QCSSENDATA Send Data Via Control Plane or User Plane

AT+QCSSENDATA Send Data Via Control Plane or User Plane	
Description	The set command could send data via control plane or user plane
Test Command AT+QCSSENDATA=?	Response +QCSSENDATA: (range of supported<cid>s),(maximum number of octets of user data indicated by<data_length>),(list of supported<RAI>s),(list of supported<type_of_user_data>s)
Write Command AT+QCSSENDATA=<cid>,<data_length>,<data>[,<RAI>[,<type_of_user_data>]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<cid>	Integer type; specifies a particular PDP context definition.
<data_length>	Integer type. Indicates the number of octets of the <data>information element. The max length is 950.
<data>	String of octets.
<RAI>	0 No information available 1 The MT expects that exchange of data will be completed with the transmission of this UL packet. 2 The MT expects that exchange of data will be completed with the receipt of a DL packet.

<type_of_user_data>	0 Regular data
	1 Exception data

NOTE

Difference with AT+CSODCP, AT+CSODCP limit to transmit data over control plane to network, but this AT don't have such limitation.

4.2.9 +RECVNONIP Indicate Downlink NON-IP Data

+RECVNONIP Indicate Downlink NON-IP Data	
Description	This is an unsolicited code message used to indicate downlink NON-IP data. +RECVNONIP: <cid>,<data_length>,<data>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	Integer type; specifies a particular PDP context definition. <cid> values of 1-11 are supported.
<data_length>	Integer type. Indicates the number of octets of the <data> information element.
<data>	string of octets.

4.2.10 AT+QCPMUCFG Set PMU mode

AT+QCPMUCFG Set PMU mode	
Description	The command set PMU mode. Read command returns the current setup. Test command returns values supported as a compound value.
Test Command AT+QCPMUCFG=?	Response +QCPMUCFG: (range of supported<enable>s),(list of supported<mode>s)
Read Command	OK Response

AT+QCPMUCFG?	+QCPMUCFG: <enable>[,<mode>]
	OK
Write Command AT+QCPMUCFG=<enable>[,<mode>]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<ENABLE>	0 Disable the PMU, <mode> will be ignored and only enter idle 1 Enable the PMU
<MODE>	0 Active <u>1</u> Idle 2 Sleep1 3 Sleep2 4 Hibernate

4.2.11 AT+QCSMSEND Send one SMS

AT+QCSMSEND Send one SMS	
Description	The command is used to send one SMS. Currently we only support TEXT mode.
Write Command AT+QCSMSEND=<mode>,<da>[,<toda>,<test_sms>]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	1 TEXT mode
<da>	destination for TXT mode
<toda>	integer type; Type of destination address
<test_sms>	Message's content for TXT mode

4.2.12 AT+QCCGSN Sets the IMEI and SN

AT+QCCGSN Sets the IMEI and SN	
Description	The command is used to send one SMS. Currently we only support TEXT mode.
Test Command AT+QCCGSN=?	Response +QCCGSN: (list of supported<type>s),(data) OK
Write Command AT+QCCGSN=<type>,<sn/imei>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<type>	Can be "IMEI" or "SN"
<sn/imei>	SN(31bytes maximum as visable character)

4.2.13 AT+QCRFSTAT Shows the Status of RF Calibration

AT+QCRFSTAT Shows the Status of RF Calibration	
Description	The command shows the status of RF calibration.
Test Command AT+QCRFSTAT=?	Response +QCRFSTAT:<status> OK
Execute Command AT+QCRFSTAT	Response +QCRFSTAT: calibrate done OK If RF is not calibrated, response: +QCRFSTAT: not calibrate

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

4.2.14 AT+QCRST Restart the Chip

AT+QCRST Restart the Chip	
Description	The command restart the chip.
Execution Command	Response
AT+QCRST	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

4.2.15 AT+QCPSMR Report the Power Saving Mode Status

AT+QCPSMR Report the Power Saving Mode Status	
Description	The command report the power saving mode status.
Test Command	Response
AT+QCPSMR=?	+QCPSMR: (range of supported<n>s)
	OK
Read Command	Response
AT+QCPSMR?	+QCPSMR: <n>,<mode>
	OK
	or
	+CME ERROR: <err>
Write Command	Response
AT+QCPSMR=<n>	OK
	or
	+CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<n>	0: disable unsolicited result code 1: enable unsolicited result code +QCPSMR: <mode>
<mode>	0: normal mode 1: power saving mode

4.2.16 AT+QCPLMNS Used to trigger a PLMN

AT+QCPLMNS Used to trigger a PLMN	
Description	Set command is used to trigger a PLMN search while UE is out of service, if UE is not out of service, +CME ERROR: <err> is returned. Read command returns the current PLMN search state, and the reset of time of PLMN search timer.
Test Command AT+QCPLMNS=?	Response OK
Read Command AT+QCPLMNS?	Response +QCPLMNS: <state>[,<oosTimeStep>] OK
Execute Command AT+QCPLMNS	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<state>	0 Deactivated, no PLMN search is ongoing 1 Searching, PLMN search is ongoing 2 Selected, already selected a PLMN 3 OOS, UE is out of service and has started a PLMN search timer
<oosTimeStep>	Integer type. The rest of time (in seconds) of OOS PLMN search timer, only present when <state> is 3.

4.2.17 AT+QCCESQS Controls the Extended Signal Quality Change Event Reporting

AT+QCCESQS Controls the Extended Signal Quality Change Event Reporting	
Description	The set command controls the extended signal quality change event reporting. If reporting is enabled the MT returns the unsolicited result codes: +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> , or +QCCESQ: RSRP,<rsrp>,RSRQ,<rsrq>,SNR,<snr> whenever the extended signal quality is changed. If setting fails in an MT error, +CME ERROR: <err> is returned.
Test Command AT+QCCESQS=?	Response +QCCESQS: (list of supported<report level>s) OK
Read Command AT+QCCESQS?	Response +QCCESQS: <report level> OK
Execution Command AT+QCCESQS=<report level>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<report level>	0 disable unsolicited report. 1 report +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> 2 report +QCCESQ: RSRP,<rsrp>,RSRQ,<rsrq>,SNR,<snr>
<rxlev>	99 not known or not detectable
<ber>	99 not known or not detectable
<rscp>	255 not known or not detectable
<ecno>	255 not known or not detectable
<rsrp>	For +CESQ reporting, refer to sub clause 2.2.9 AT+CESQ For +QCCESQ reporting, the range is -34 dB to 2.5 dB
<rsrq>	For +CESQ reporting, refer to sub clause 2.2.9 AT+CESQ For +QCCESQ reporting, the range is -34 dB to 2.5 dB
<snr>	The range is -30 dB to 30 dB

4.2.18 AT+QCSTATUS Returns Some Key Parameter in UE Side

AT+QCSTATUS Returns Some Key Parameter in UE Side	
Description	This action command returns some key parameter in UE side.
Test Command AT+QCSTATUS=?	<p>Response</p> <p>+QCSTATUS: (list of supported<layer>s)</p> <p>OK</p>
Write Command AT+QCSTATUS=<layer>	<p>Response</p> <p>1)If <layer> is PHY: +QCSTATUS: PHY, DIEarfcn:<dIEarfcn>,UIEarfcn:<ulEarfcn>, PCI:<pci>, Band:<band>,RSRP:<rsrp>, RSRQ:<rsrq>, SNR:<snr>, AnchorFreqOfst:< AnchorFreqOfst >,NonAnchorFreqOfst:< NonAnchorFreqOfst >,CeLevel:<ceLevel>, DIBler:<dIBler>, UIBler:<ulBler>,DataInactTimerS:<dataInactTimers>,RetxBsRTimerP:<retxBsRTimerP>, TAvalue:<taValue>, TxPower<txPower>,NBMode:<nbMode></p> <p>2)If <layer> is L2: +QCSTATUS: L2, SrbNum:<srbNum>, DrbNum:<drbNum></p> <p>3)If <layer> is RRC: +QCSTATUS: RRC, State:<rrcState>, TAC:<tac>,CellId:<cellId></p> <p>4)If <layer> is EMM: +QCSTATUS: EMM, EmmState:<emmState>,EmmMode:<emmMode>, PTWms:<ptwMs>,EDRXPeriodMs:<eDRXPeriodMs>, PsmExT3412TimerS:<psmExT3412TimerS>,T3324TimerS:<T3324TimerS>,T3346RemainTimeS:<T3346RemainTimeS></p> <p>5)If <layer> is PLMN: +QCSTATUS: PLMN, PlmnState:<plmnState>,PlmnType:<plmnType>, SelectPlmn:<selectPlmn></p> <p>6)If <layer> is ESM: +QCSTATUS: ESM, ActBearerNum:<actBearerNum>,APN:<apn>, IPv4:<Ipv4Addr ipv6Addr></p> <p>7)If <layer> is CCM: +QCSTATUS: CCM, Cfun:<cfun>, IMSI:<imsi></p> <p>OK</p>
Execution Command AT+QCSTATUS	<p>Response</p> <p>+QCSTATUS: PHY, DIEarfcn:<dIEarfcn>,UIEarfcn:<ulEarfcn>, PCI:<pci>, Band:<band>,RSRP:<rsrp>, RSRQ:<rsrq>, SNR:<snr>, AnchorFreqOfst:< AnchorFreqOfst >,NonAnchorFreqOfst:< NonAnchorFreqOfst >, CeLevel:<ceLevel>, DIBler:<dIBler>, UIBler:<ulBler>, DataInactTimerS:<dataInactTimers>,</p> </td> </p>

	<p>RetxBSRTimerP:<retxBSRTimerP>, TAvalue:<taValue>, TxPower<txPower>,NBMode:<nbMode> +QCSTATUS: L2, SrbNum:<srbNum>, DrbNum:<drbNum> +QCSTATUS: RRC, State:<rrcState>, TAC:<tac>, CellId:<cellId> +QCSTATUS: EMM, EmmState:<emmState>, EmmMode:<emmMode>, PTWMs:<ptwMs>, EDRXPeriodMs:<eDRXPeriodMs>, PsmExT3412TimerS:<psmExT3412TimerS>, T3324TimerS:<T3324TimerS>, T3346RemainTimeS:<T3346RemainTimeS> +QCSTATUS: PLMN, PlmnState:<plmnState>, PlmnType:<plmnType>, SelectPlmn:<selectPlmn> +QCSTATUS: ESM, ActBearerNum:<actBearerNum>, APN:<apn>, IPv4: <Ipv4Addr ipv6Addr> +QCSTATUS: CCM, Cfun:<cfun>, IMSI:<imsi> +QCSTATUS: PLAT, SLEEP TIME: High 32 Bits: <HighBits>, Low 32 Bits: <LowBits></p> <p>OK</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<layer>	<p>Protocol layer: PHY: Physical Layer L2: Layer 2 RRC: Radio Resource Control EMM: EPS Mobility Management PLMN: Public Land Mobile Network ESM: EPS Server Management CCM: CloT Connection Management PLAT not supported query solely</p>
<dlEarfcn>	Downlink earfcn, value range is 0~262143
<ulEarfcn>	Uplink earfcn, value range is 0~262143
<pci>	Physical cell ID, value range is 0~503,255
<band>	Band, value range is 0~70
<rsrp>	Value in dBm, range is -156dBm ~ -44dBm
<rsrq>	Value in dB, range is -34dB ~ -2.5dB
<snr>	Value in dB, range is -30dB ~ 30dB
<ceLevel>	<p>0 CE level 0 1 CE level 1</p>

	2 CE level 2
<dIBler>	Downlink block error, value range is 0~10000
<ulBler>	Uplink block error, value range is 0~10000
<dataInactTimerS>	Data inactive timer in seconds, value range is 0~180
<retxBSRTimerP>	Timer for BSR reporting, value in number of PDCCH periods. Value pp4 corresponds to 4 PDCCH periods, pp16 corresponds to 16 PDCCH periods and so on.
<NBMode>	Value range is "InBand Same PCI","InBand Diff PCI","Guard Band","Stand alone"
<srNum>	Value range is 0~2
<drbNum>	Value range is 0~2
<rrcState>	Value range is "DEACT", OOS", IDLE", SUSPEND IDLE", CONNECTED", UNKONWN
<tac>	Value range is 0~65534
<cellId>	Value range is 0~268435455
<emmState>	Value range is "NULL", "DEREG", "REG INIT", "REG", "DEREG INIT", "TAU INIT", "SR INIT", "UNKNOWN"
<emmMode>	Value range is "IDLE", "PSM", "CONNECTED", "UNKNOWN"
<ptwMs>	eDRX Paging Time Window in milliseconds
<edrxPeriodMs>	eDRX period in milliseconds
<psmExt3412TimerS>	Extended T3412 timer value in seconds
<T3324TimerS>	T3324 timer value in seconds
<T3346RemainTimeS>	If T3346 is running, set to the remaining time, else set to 0
<plmnState>	Value range is "NO PLMN", "SEARCHING", "SELECTED", "UNKNOWN"
<plmnType>	Value range is "HPLMN", "EHPLMN", "VPLMN", "UPLMN", "OPLMN", "UNKNOWN"
<selectPlmn>	Selected PLMN
<actBearerNum>	activated bearer number
<apn>	access point name
<ipv4Addr ipv6Addr>	Ipv4/Ipv6 address
<fun>	0 Minimum functionality 1 Full functionality 4 Turn off RF
<IMSI>	International Mobile Subscriber Identity (string with double quotes)
<AnchorFreqOfst>	Integer type Range is 0 ~ 21, stand for Frequency Offset {Invalid, -10,-9,-8,-7,-6,-5,-4,-3,-2,-1,-0.5,0,1,2,3,4,5,6,7,8,9}
<NonAnchorFreqOfst>	Integer type Range is 0 ~ 21, stand for Frequency Offset {Invalid, -10,-9,-8,-7,-6,-5,-4,-3,-2,-1,-0.5,0,1,2,3,4,5,6,7,8,9}

<taValue>	Integer type Timing advance value. Value range is 0~1282. -1 is invalid value
<txPower>	Integer type Current TX power level in dBm. Value range is -45~23. -128 is invalid value
<HighBits>,<LowBits> >	UE total sleeptime in seconds.

4.2.19 AT+QCICCID Causes the TA to Return the ICCID of the UICC

AT+QCICCID Causes the TA to Return the ICCID of the UICC

Description	Execution command causes the TA to return the ICCID of the UICC.
Test Command AT+QCICCID=?	Response OK
Execution Command AT+QCICCID	Response +QCICCID: <ICCID> OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<ICCID>	Integrated circuit card identification
---------	--

4.2.20 AT+QCBCINFO Return the Basic Serving Cell Information

AT+QCBCINFO Return the Basic Serving Cell Information

Description	Execution command to return the basic serving cell information and neighbor cells information, mainly used for location service.
-------------	--

Test Command AT+QCBCINFO=?	Response +QCBCINFO: [(list of supported<mode>s), (list of supported<timeoutS>s) [(list of supported<save_for_later>s), (list of supported<max_cell_number>s), (list of supported<report_mode>s)]]]] OK
Write Command AT+QCBCINFO[=<mode>[, <timeoutS>[, <save_for_later>[, <max_cell_number>[, <report_mode>]]]]]	Response OK or +CME ERROR: <err>
Execution Command AT+QCBCINFO	Response +QCBCINFOSC: <earfcn>,<pci>,<rsrp>,<rsrq>,<mcc>,<mnc>,<cellid>,<tac>[<CR><LF> +QCBCINFONC: <earfcn>,<pci>,<rsrp>,<rsrq>[...]] OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Only search/measure neighbor cell signal quality: RSRP and RSRQ, don't acquire neighbor cell SIB-NB, don't return cell location information. In this mode, neighbor cell information in AT response is: +QCBCINFONC: <earfcn>,<pci>,<rsrp>,<rsrq> Note: default value 0 1 Search cell, including measure cell and acquire cell SIB1-NB to get cellID, PLMN and tac info. In this mode, neighbor cell information in AT response is: +QCBCINFONC: <earfcn>,<pci>,<rsrp>,<rsrq>,<mcc>,<mnc>,<cellid>,<tac> 2 Read saved cell information, <save_for_later> set to 1 should be called before, and otherwise, no cell information will be returned.
<timeoutS>	Integer type MAX measurement time in unit of seconds, cell information should be acquired/returned in this time period. Note: 1. Range: (4-300) 2. Default value: 8
<save_for_later>	Integer type Whether need to save cell information, which could be returned in case of AT+QCBCINFO=2 later.

	<p>Note:</p> <ol style="list-style-type: none"> 1. As the cell information should be saved into flash when enter deep sleep mode: sleep2 and HIB, don't suggest to save it frequently. 2. List value: (0,1) 3. Default value: 0, not save.
<max_cell_number>	<p>Integer type</p> <p>Max number of cells to be measured or searched, including serving cell.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. The more cells needed, the longer measurement time it takes. 2. Range: (1-5) 3. Default value: 5
<report_mode>	<p>Integer type</p> <p>0 Synchronous modes. Report cell info in AT response.</p> <p>Note: Default value: 0</p> <p>1 Asynchronous mode. AT response immediately, measured cell information returned in URC:</p> <pre>[<CR><LF>+QCBCINFOSC: <earfcn>,<pci>,<rsrp>,<rsrq>,<mcc>,<mnc>,<cellid>,<tac>[<CR><LF> [<CR><LF>+QCBCINFONC: <earfcn>,<pci>,<rsrp>,<rsrq>[,<mcc>,<mnc>,<cellid>,<tac>] [...]]</pre>
<earfcn>	Indicate the EARFCN of the cell. Range 0 ~ 262143
<pci>	Indicate the physical cell ID. Range 0 ~ 503
<rsrp>	Indicate the measurement of RSRP value, in unit of dBm. Range -156 ~ -44
<rsrq>	Indicate the measurement of RSRQ value, in unit of dB. Range -34 ~ 25
<mcc>	Indicate the mobile country code
<mnc>	Indicate the mobile network code
<cellid>	Four byte E-UTRAN cell ID in hexadecimal format
<tac>	String type Two byte tracking area code in hexadecimal format

4.2.21 AT+QCDNS Get the IP Address for a Specific URL

AT+QCDNS Get the IP Address for a Specific URL	
Description	This command to get the IP address for a specific URL. As a limitation now, only one IP address is returned for a URL
Test Command	Response
AT+QCDNS=?	OK

Execution Command AT+QCDNS=<url>	Response +QCDNS: <ipaddr> OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<url>	Domain name
<ipaddr>	If IPv4 type, output is dot-notation format, such as: "32.1.13.184" If IPv6 type, output is colon-notation format, such as: "2001:0DB8:0000:CD30:0000:0000:0000:0002"

4.2.22 AT+QCDNSCFG Set the Default DNS Addresses Configuration

AT+QCDNSCFG Set the Default DNS Addresses Configuration	
Description	This command to get the IP address for a specific URL. As a limitation now, only one IP address is returned for a URL
Test Command AT+QCDNSCFG=?	Response OK
Read Command AT+QCDNSCFG?	Response +QCDNSCFG: <ipaddr1>[,<ipaddr2>[,<ipaddr3>[,<ipaddr4>]]] OK
Execution Command AT+QCDNSCFG=<ipaddr1>[,<ipaddr2>[,<ipaddr3>[,<ipaddr4>]]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<ipaddr>	If IPv4 type, output is dot-notation format, such as: "32.1.13.184" If IPv6 type, output is colon-notation format, such as: "2001:0DB8:0000:CD30:0000:0000:0000:0002"
----------	---

4.2.23 AT+QCEMMTIME Report and Get the Emm Time State

AT+QCEMMTIME Report and Get the Emm Time State	
Description	This command report and get the Emm Time State, include T3346、T3448 and T3412/extend T3412.
Test Command AT+QCEMMTIME=?	Response +QCEMMTIME: (range of supported<bitmap>s) OK
Read Command AT+QCEMMTIME?	Response +QCEMMTIME:0,<timeState>[,<remainTimeValue>] +QCEMMTIME:1,<timeState>[,<remainTimeValue>] +QCEMMTIME:2,<timeState>[,<remainTimeValue>] OK
Write Command AT+QCEMMTIME=<bit map>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<bitmap>	bit 0: enable/disable unsolicited result code T3346 bit 1: enable/disable unsolicited result code T3448 bit 2: enable/disable unsolicited result code T3412/ext T3412
<timeId>	0: Emm Timer: T3346 1: Emm Timer: T3448 2: Emm Timer: T412/ext T3412
<timeState>	0: Start 1: Stop 2: Expiry
<remainTimeValue>	Time remain value in seconds, Only include when <timeState> is 0.
<timeValue>	Time value in seconds, Only include when <timeState> is 0.

4.2.24 AT+QCPCFG Set Plat Configure

AT+QCPCFG Set Plat Config	
Description	Set command is used to set plat config, if UE is not out of service, +CME ERROR: <err> is returned. Read command returns the current plat config setting.
Test Command AT+QCPCFG=?	Response +QCPCFG:<option>,<setting>
Read Command AT+QCPCFG?	Response +QCPCFG: < option>,< setting>,< option>,< setting>,...
Write Command AT+QCPCFG=<option> ,<setting>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<option>	faultAction Set the hardfault action mode dumpToATPort Set show assert dump in AT port or not startWDT Set watch dog mode logCtrl Set log control mode logLevel Set log print level logBaudrate Set log print baud rate slpWaitTime Set sleep wait time
<setting>	For faultAction, the values range is from 0 to 4 0: dump full exception info to flash and EPAT tool then trapped in endless loop 1: print necessary exception info then reset 2: dump full exception info to flash then reset 3: dump full exception info to flash and EPAT tool then reset 4: reset directly. Suggest set to this value when mass production stage. For dumpToATPort, the values range is from 0 to 1 0: not dump to AT port 1: dump to AT port For startWDT, the values range is from 0 to 1 0: stop WDT

1: start WDT. Suggest set to this value when mass production stage.

For logCtrl, the values range is from 0 to 2

0: unilog is disabled

1: only sw log is enabled

2: All log is enabled

For logLevel, the values range is from 0 to 5

0: debug log level

1: info log level

2: value log level

3: signal log level

4: warning log level

5: error log level

For logBaudrate, the values range is from 921600 to 6000000.

Default value is 3000000.

For slpWaitTime, the values range is from 0 to 0xffff

Default value is 0.

4.2.25 AT+QCSLEEP Power Consumption Test

AT+QCSLEEP Power Consumption Test

Description	This command is used for power consumption test. After executing this command, UE will enter related low power state. And UE could be wake up by wakeup PAD, after wake up, UE will reboot.
Test Command AT+QCSLEEP=?	Response +QCSLEEP: <state>
Write Command AT+QCSLEEP=<state>	Response +QCSLEEP: <mode> OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<state>	0 HIB2 1 HIB1 2 SLEEP2
---------	------------------------------

	3 SLEEP1
<mode>	HIB2 Hibernate2 status HIB1 Hibernate1 status SLEEP2 Sleep2 status SLEEP1 Sleep1 status

4.2.26 AT+QCSIMSLEEP Set UE to Allow SIM Card Sleep for Power Consumption

AT+QCSIMSLEEP Set UE to Allow SIM Card Sleep for Power Consumption	
Description	The command set UE to allow SIM card sleep for power consumption. The read command return current setting of each parameters. The test command returns values supported as a compound value.
Test Command AT+QCSIMSLEEP=?	Response +QCSIMSLEEP: < list of support mode>
Read Command AT+ QCSIMSLEEP?	OK Response +QCSIMSLEEP: <mode> OK or +CME ERROR: <err>
Write Command AT+QCSIMSLEEP=<m ode>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Not allowed SIM sleep 1 Allowed SIM sleep
--------	--

4.2.27 AT+QCCGSNLOCK Set Lock Flag for IMEI and SN

AT+QCCGSNLOCK Set Lock Flag for IMEI and SN	
---	--

Description	This command is used to set lock flag for IMEI and SN. If locked, IMEI and SN could not be write via AT+QCCGSN command. The lock feature maybe required in production stage, to prevent customer's miss operation. If lock is set, it could not be cleared via AT command, the only way to clear it is via flash tool (erase related region).
Test Command AT+QCCGSNLOCK=?	Response +QCCGSNLOCK: <list of support para> OK
Read Command AT+QCCGSNLOCK?	Response +QCCGSNLOCK: <imeistatus,snstatus> OK or +CME ERROR: <err>
Write Command AT+QCCGSNLOCK=<para>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<para>	"IMEI" "SN"
<imeistatus>	"IMEI LOCKED" "IMEI NOT LOCKED "
<snstatus>	"SN LOCKED" "SN NOT LOCKED "

4.2.28 AT+QCSAVEFAC Saves Related Regions to Default Reliable Region

AT+QCSAVEFAC Saves Related Regions to Default Reliable Region

Description	This command is used in production line, which saves related regions to default reliable region.e.g. after IMEI/SN was written or RF calibration was done. Default reliable regions is used to restore factory setting.
-------------	--

Test Command AT+QCSAVEFAC=?	Response +QCSAVEFAC: <mode> OK
Write Command AT+QCSAVEFAC=<mode>	Response +QCSAVEFAC:OK OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	"all" All regions "rfregion" Only RF regions "other" Regions except RF, currently IMEI/SN region
---------------------	--

4.2.29 AT+QCTASKINFO Returns All the Task's Information

AT+QCTASKINFO Returns All the Task's Information	
Description	The execution command returns all the task's name, id, status, priority and stack information. This command is only for debug purpose.
Execution Command AT+QCTASKINFO	Response <task information> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

4.2.30 AT+QCSHOWMEM Shows Current Heap Memory Usage

AT+QCSHOWMEM Shows Current Heap Memory Usage	
Description	The execution command shows current heap memory usage. This command is only for debug purpose.
Execution Command	Response

AT+QCSHOWMEM	curr_free_heap:<curr_free_heap>, min_free_heap:<min_free_heap> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<curr_free_heap>	0—heap size current remained free memory size in heap
<min_free_heap>	0---heap size minimum heap memory size ever remaining in heap

4.2.31 AT+QCSYSTEST Triggers a Test Feature

AT+QCSYSTEST Triggers a Test Feature	
Description	This command is only for debug purpose. The test command returns option supported as a compound value. The set command triggers a test feature..
Test Command AT+QCSYSTEST=?	Response +QCSYSTEST: <option> OK
Write Command AT+QCSYSTEST=<option>	Response OK or When <test>="assert" or "fsassert" system assert +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<option>	handshake Perform handshake with UE
	assert Trigger a test assert
	testwdt Trigger watch dog test
	fsassert Trigger file system assert for test
	hardfault Trigger a hardfault for test

4.2.32 AT+QCVOTECHK Analyze the Reason of Sleep Failure

AT+QCVOTECHK Analyze the Reason of Sleep Failure

Description	This command shows current vote state, which can help to analyze the reason of sleep failure. This command is only for debug purpose.
Write Command AT+QCVOTECHK	Response Sleep Vote Info: <vote info detail> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

NOTE

- Vote info detail shows comprehensive information which will affect sleep process in QCX212.
 - Part1: user set sleep depth limitation.
 - Part2: QCX212 internal sleep vote result.
 - Part3: application vote result.
 - Part4: user registered sleep depth callback.
 - Part5: driver vote result.
- For more detail information, please refer to slpman_qcx212.h in SDK and QCX212 low power development manual.

4.2.33 AT+QCURC Close/Open URC Report

AT+QCURC Close/Open URC Report

Description	The command close/open URC (unsolicited result code) report.
Test Command AT+QCURC=?	Response +QCURC: "ALL":(0-1), "CREG":(0-1), "CEREG":(0-1), "CEDRXP":(0-1), "CCIOTOPTI":(0-1), "CSCON":(0-1), "CTZEU":(0-1), "QCCESQ":(0-1), "CGEV":(0-1), "QCPSMR":(0-1), "QCPTWEDRXP":(0-1), "QCPIN":(0-1), "QCPADDR":(0-1), "QCPCFUN":(0-1) OK
Read Command AT+QCURC?	Response +QCURC: "CREG":<value>,"CEREG":<value>,"CEDRXP":<value>,"CCIOTOPTI":

	<code><value>,"CSCON":<value>,"CTZEU":<value>,"QCCESQ":<value>,"CGEV":<value>,"QCPSMR":<value>,"QCPTWEDRXP":<value>,"QCPIN":<value>,"QCPADDR":<value>,"QCPCFUN":<value></code>
	OK or +CME ERROR: <err>
Write Command AT+QCURC=<option>,<value>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<option>	"ALL" All unsolicited result codes included as below "CREG" unsolicited result code +CREG "CEREG" unsolicited result code +CEREG "CEDRXP" unsolicited result code +CEDRXP "CCIOTOPTI" unsolicited result code +CCIOTOPTI "CSCON" unsolicited result code +CSCON "CTZEU" unsolicited result code +CTZEU "QCCESQ" unsolicited result code +QCCESQ "CGEV" unsolicited result code +CGEV "QCPSMR" unsolicited result code +QCPSMR "QCPTWEDRXP" unsolicited result code +QCPTWEDRXP "QCPIN" unsolicited result code +QCPIN "QCPADDR" unsolicited result code +QCPADDR "QCPCFUN" unsolicited result code +QCPCFUN
<value>	0 disable unsolicited result code report 1 enable unsolicited result code report

AT+QCURC="ALL",1

OK

NOTE

Set of <value> will save to NVM, and the default value is 0.

4.2.34 AT+QCPTWEDRXS Control Whether the UE

AT+QCPTWEDRXS Control Whether the UE	
Description	A special form of the command can be given as AT+QCPTWEDRXS=3. In this form, paging time window and eDRX will be disabled and data for all parameters in AT+QCPTWEDRXS command will be removed.
Test Command AT+QCPTWEDRXS=?	Response +QCPTWEDRXS: (list of supported<mode>s),(list of supported <AcT-type>s),(list of supported<Requested_Paging_time_window>s),(list of supported<Requested_eDRX_value>s)
Read Command AT+QCPTWEDRXS?	Response +QCPTWEDRXS: <AcT-type>,<Requested_Paging_time_window>,<Requested_eDRX_value>[,<NW_provided_eDRX_VALUE>[,<Paging_time_window>]]
Write Command AT+QCPTWEDRXS=[<mode>[,<AcT-type>[,<Requested_Paging_time_window>[,<Requested_eDRX_value>]]]]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Disable the use of requested paging time window and eDRX 1 Enable the use of requested paging time window and eDRX 2 Enable the use of requested paging time window and eDRX and enable the unsolicited result code: +QCPTWEDRXP: <AcT-type>[,<Requested_Paging_time_window>[,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]] 3 Disable the use of paging time window and eDRX and discard all parameters for pagint time window and eDRX.
<AcT-type>	5 NB IOT
<Requested_Paging_time_window>	String type; half a byte in a 4 bit format. The paging time window referes to bit 8 to 5 of octet 3 of the Extended DRX parameters information element.

	(e.g. "0000" equals 2.56 seconds)
<Requested_eDRX_value>	String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. (e.g. "0010" equals 20.48 seconds)
<NW-provided_eDRX_value>	String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. (e.g. "0010" equals 20.48 seconds)
<Paging_time_window>	String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element. (e.g. "0000" equals 2.56 seconds)

4.2.35 AT+QCPIN Indicate SIM PIN State

+QCPIN Indicate SIM PIN State	
Description	This is an unsolicited result code used to indicate SIM PIN state. It's controlled by AT+QCURC. +QCPIN: <code>

Defined Values

<code>	READY MT is not pending for any password SIM PIN MT is waiting SIM PIN to be given SIM PUK MT is waiting SIM PUK to be given SIM PUK BLOCKED The SIM is locked SIM NOT READY The SIM is not ready.
--------	--

4.2.36 AT+QCPCFUN Power on status URC report

+QCPCFUN Power on status URC report	
Description	This is an unsolicited result code used to indicate the setting of <fun> as AT+CFUN when the MT powered on. It's controlled by AT+QCURC. +QCPCFUN: <fun>

Defined Values

<fun>	0 Minimum functionality 1 Full functionality
-------	---

4 Turn off RF.

4.2.37 AT+QCPADDR Print PDP Address

+QCPADDR Print PDP Address

Description	This is an unsolicited result code used to indicate SIM PIN state. It's controlled by AT+QCURC.
	+QCPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]

Defined Values

<cid>	specifies a particular PDP context definition (see the +CGDCONT commands). <cid> values of 1-11 are supported.
<PDP_addr_1> <PDP_addr_2>	<PDP_addr_1> and <PDP_addr_2>: each is a string type that identifies the MT in the address space applicable to the PDP. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none is available. Both <PDP_addr_1> and <PDP_addr_2> are included when both IPv4 and IPv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address. The string is given as dot-separated numeric (0-255) parameter of the form: a1.a2.a3.a4 for IPv4 and colon-separated hexadecimal parameter of the form:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx for IPv6.

4.2.38 AT+QCADC Read ADC

AT+QCADC Read ADC

Description	This command is used to get thermal temperature and VBAT values sampled by ADC.
Test Command AT+QCADC=?	Response +QCADC: <option>
Write Command AT+QCADC=<option>	Response +QCADC: <option>, <value>[,<option> ,<value>]
Read Command AT+QCADC?	Response +QCADC: 1,<value>

	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<option>	Temp Get current thermal temperature in unit of degree centigrade with 1 degree resolution. Vbat Get current VBAT value in unit of mV. All Get current thermal temperature and VBAT value.
<value>	Corresponding value of option

4.2.39 AT+QCSWC Set the UE Operation SIM Counter

AT+QCSWC Set the UE Operation SIM Counter	
Description	The command set UE to enable, disable, query and reset SIM write counter. The counter record the execution of SIM write command, such as update binary and update record
Test Command AT+QCSWC=?	Response +QCSWC: (list of supported <mode>s)
Read Command AT+QCSWC?	Response +QCSWC: <mode>
Write Command AT+QCSWC=<mode>	Response OK or +CME ERROR: <err> When <mode>=2 and command successful: +QCSWC: <filename>,<counter> +QCSWC: <filename>,<counter> ...
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Disable the SIM write counter 1 Enable the SIM write counter 2 Query the SIM write counter 3 Reset all SIM write counter as 0
<filename>	SIM EF name, referred to TS31.102, "null" means no file written.
<counter>	if overflow occurs, restart from 0.

4.2.40 AT+QCIPR Operate the Baud Rate of UE

AT+QCIPR Operate the Baud Rate of UE	
Description	Set command sets the UE baud rate to be used. Read command returns the current baud rate. Test command returns baud rates supported by the UE.
Test Command AT+QCIPR=?	Response +QCIPR: (list of fixed-only<rate> values) OK
Read Command AT+QCIPR?	Response +QCIPR: <rate> OK
Write Command AT+QCIPR=<rate>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<rate>	Baud rate at which the UE will accept commands.
---------------------	---

4.2.41 AT+QCNPICFG Operating NPI

AT+QCNPICFG Operating NPI	
Description	Set command is used to set NPI config Read command returns the current NPI config setting.
Test Command AT+QCNPICFG=?	Response +QCNPICFG: <option>,<setting> OK
Read Command AT+QCNPICFG?	Response +QCNPICFG: "rfCaliDone":<setting>, "rfNSTDone":<setting> OK
Write Command AT+QCNPICFG=<option>,<setting>[,<option>,<setting>]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<option>	rfCaliDone Set RFCALI process status rfNSTDone Set RFNST process status
<setting>	For rfCaliDone , the values range is from 0 to 1 0: RFCALI process is not done 1: RFCALI process is done For rfNSTDone, the values range is from 0 to 1 0: RFNST process is not done 1: RFNST process is done

4.2.42 AT+QCPRMODE Control NPI production mode

AT+QCPRMODE Control NPI production mode	
Description	Set command is used to control entering NPI production mode. Read command returns the current NPI production mode status.

Test Command AT+QCPRMODE=?	Response +QCPRMODE: <status> OK
Read Command AT+QCPRMODE?	Response +QCPRMODE: "prodModeEnable":<value1>,"prodModeEnter":<value2> OK
Write Command AT+QCPRMODE=<setting>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<setting>	prodModeEnable Enable production mode prodModeDisable Disable production mode prodModeEnter Enter production mode prodModeExit Exit production mode
<value1>	0: prodMode is disabled 1: prodMode is enabled
<value2>	0: prodMode isn't entered 1: prodMode is entered
<status>	reflects prodMode status

4.2.43 AT+QCLEDMODE Enable the Netlight Function

AT+QCLEDMODE Enable the Netlight Function	
Description	Set command is used to enable the Netlight function. Read command returns the whether the Netlight function is enable or not.
Test Command AT+QCLEDMODE=?	Response +QCLEDMODE: (0,1) OK
Read Command AT+QCLEDMODE?	Response +QCLEDMODE: <state>

	OK
Write Command AT+QCLEDMODE=<state>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<state>	0 Netlight function disable 1 Netlight function enable
----------------------	---

NOTE

In QCX212 NB-IoT SDK, Netlight is set to PAD 30 using PWM Instance 5. It can be changed by rewrite NetLightInit function (in bsp_custom.c).

- Netlight function may cause extra power consumption
- All sleep is disabled, until NB enter Idle/PSM
- A pull-down resistor is needed to keep Pad low to avoid unwanted flickerl.
- Netlight Indication Note NB Status

HighLevel 64ms(LED ON)/ LowLevel 800ms(LED OFF) Network searching

HighLevel 64ms(LED ON)/ LowLevel 2000ms(LED OFF) Network connected in NB Connect state

Keep Low Level NB Idle/PSM or other

4.2.44 AT+QCPOWERCLASS Sets the Band Power Class

AT+QCPOWERCLASS Sets the Band Power Class

Description	The command sets the band power class. Read command returns the current band and related power class setting. Test command returns the bands and related power class supported by the UE.
Test Command AT+QCPOWERCLASS=?	Response +QCPOWERCLASS: <band1>,(list of supported <power class>s) +QCPOWERCLASS: <band2>,(list of supported <power class>s) ...

	OK
Read Command AT+QCPOWERCLASS?	Response +QCPOWERCLASS: <band1>,<power class> +QCPOWERCLASS: <band2>,<power class> ...
Write Command AT+QCPOWERCLASS=<band>,<powerclass>	Response OK or +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<band>	Band in decimal number.All bands supported by RF. 0 is to set power class of all bands.
<power class>	3 UE maximum output power is 23dBm 5 UE maximum output power is 20dBm 6 UE maximum output power is 14dBm

NOTE

AT+QCPOWERCLASS must be restricted to execute under power off or air plane state.Parameter <power class> can only be set to 6 when "RelVersion" in AT+QCCFG is 14.When set parameter <power class> to 6,parameter <band> must be set to 0.

4.2.45 AT+VIOSET Set the voltage of IO

AT+VIOSET Set the voltage of IO

Description	Set command is used to set the voltage of IO.
Test Command AT+VIOSET=?	Response +VIOSET: (1,2,3) OK
Write Command	Response

AT+VIOSET=<vol>	OK or +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<vol>	1 Set IO voltage 1.8V, IO_1833_SEL should be float 2 Set IO voltage 2.8V, IO_1833_SEL should be float 3 Set IO voltage 3.3V, IO_1833_SEL should be grounded
--------------------	---

4.2.46 AT+RPMPARAM Set RPM test parameters

AT+RPMPARAM Set RPM test parameters	
Description	Set command use to set all RPM parameters. Read command use to display all the RPM parameters.
Read Command AT+RPMPARAM?	Response +RPMPARAM: <rpmFlag>,<N1>,<T1>,<T1_ext>,<F1>,<F2>,<F3>,<F4>,<isOmParamsValid>,<CBR1>,<CR1>,<CPDP1>,<CPDP2>,<CPDP3>,<CPDP4>,<LR1>,<LR2>,<LR3> OK or +CME ERROR: <err>
Write Command AT+RPMPARAM=[<rpmFlag>,<N1>,<T1>,<T1_ext>,<F1>,<F2>,<F3>,<F4>]	Response OK or +CME ERROR: <err>
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<rpmflag>	Boolean type
------------------------	--------------

	0 - Disable 1 - Enable
<N1>	Integer type Max no of SW resets per Hour allowed by RPM following permanent EMM reject
<T1>	Integer type Average time before RPM resets modem following permanent EMM reject
<T1_ext>	Integer type Average time before RPM resets modem following permanent EMM reject if T1 =0xFF
<F1>	Integer type Max number of PDN Connectivity Requests per Hour allowed by RPM following PDP Activation Ignore Scenario
<F2>	Integer type Max number of PDN Connectivity Requests per Hour allowed by RPM following Permanent PDP Activation Reject
<F3>	Integer type Max number of PDN Connectivity Requests per Hour allowed by RPM following Temporary PDP Activation Reject
<F4>	Integer type Max number of PDN Connectivity Activation/ Deactivation Requests per Hour allowed by RPM
<isOmParamsValid>	Boolean type: If RPM params are present on SIM card, If not all RPM OM functionality shall be disabled 0 - Disable 1 - Enable
<CBR1>	Integer type Operational Management Counter related to N1
<CR1>	Integer type Operational Management Counter related to T1
<CPDP1>	Integer type Operational Management Counters related to F1
<CPDP2>	Integer type Operational Management Counters related to F2
<CPDP3>	Integer type Operational Management Counters related to F3
<CPDP4>	Integer type Operational Management Counters related to F4
<LR1>	Integer type Leak rate (in Hours) for C-BR-1
<LR2>	Integer type Leak rate (in Hours) for C-R-1
<LR3>	Integer type Leak rate (in Hours) for CPDP-1 to C-PDP-4

4.2.47 AT+RPMVERSION Query the RPM version

AT+RPMVERSION Query the RPM version	
Description	RPM version is read from sim card. Read command returns the current RPM version as 2.
Read Command AT+RPMVERSION?	Response +RPMVERSION:<rpmversion> OK
Parameter Saving Mode	SAVE
Max Response Time	-
Reference	

Defined Values

<rpmversion>	Integer type: Stores RPM Version
---------------------------	----------------------------------

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5 AT Commands for File System

5.1 Overview of AT Commands for File System

Command	Description
AT+FSLS	List directories/files in current directory
AT+FSDEL	Delete file in current directory
AT+FSRENAME	Rename file in current directory
AT+FSATTRI	Request file attributes
AT+FSMEM	Check the size of available memory
AT+FSCOPY	Copy an appointed file
AT+FSPRESET	Moves the location of a file

5.2 Detailed Description of AT Commands for File System

The file system is used to store files in a hierarchical (tree)structure, and there are some definitions and conventions to use the AT commands.

Local storage space is mapped to "C:" .

NOTE: General rules for naming (both directories and files):

- a) The length of actual fully qualified names of files(C:/)can not exceed 55.
- b) Directory and file names can not include the following characters: \ / : * ? " < > |
- c) Between directory name and file/directory name, use character "/" as list separator, so it can not appear in directory name or file name.
- d) File names on "C:/" drive cannot begin with "." .

5.2.1 AT+FSLS List directories/files in current directory

This command is used to list informations of directories and/or files in current directory. Support "C:".

AT+FSLs List directories/files in current directory

Test Command AT+FSLs=?	Response +FSLs: (list of supported <type>s) OK
Read Command AT+FSLs?	Response +FSLs: SUBDIRECTORIES:<dir_num>,FILES:<file_num> OK
Write Command AT+FSLs=<type>	Response [+FSLs: SUBDIRECTORIES: <list of subdirectories>] [+FSLs: FILES: <list of files>] OK
Execution Command AT+FSLs	Response [+FSLs: SUBDIRECTORIES: <list of subdirectories>] [+FSLs: FILES: <list of files>] OK
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<dir_num>	Integer type, the number of subdirectories in current directory.
<file_num>	Integer type, the number of files in current directory.
<type>	0 list both subdirectories and files 1 list subdirectories only 2 list files only

Examples

AT+FSLs?

+FSLs: SUBDIRECTORIES: 0,FILES: 2

```
OK
AT+FSLs
+FSLS: FILES:
0.txt
1.txt
```

```
OK
AT+FSLs=2
+FSLS: FILES:
0.txt
1.txt
```

```
OK
```

5.2.2 AT+FSDEL Delete file in current directory

This command is used to delete a file in current directory. Support "C:" .

AT+FSDEL Delete file in current directory

Test Command AT+FSDEL=?	Response OK
Write Command AT+FSDEL=<filename>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	String with or without double quotes, file name which is relative and already existing.
------------	---

Examples

```
AT+FSDEL=1.txt
OK
```

NOTE

If <filename> is *.* , it means delete all files in current directory.

5.2.3 AT+FSRENAME Rename file in current directory

This command is used to rename a file in current directory. Support "C:" .

AT+FSRENAME Rename file in current directory

Test Command AT+FSRENAME=?	Response OK
Write Command AT+FSRENAME=<old_name> >,<new_name>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<old_name>	String with or without double quotes, file name which is existed in current directory.
<new_name>	New name of specified file, string with or without double quotes.

Examples

```
AT+FSRENAME=0.txt,1.txt
OK
```

5.2.4 AT+FSATTRI Request file attributes

This command is used to request the attributes of file which exists in current directory. Support "C:" .

AT+FSATTRI Request file attributes

Test Command AT+FSATTRI=?	Response OK
Write Command AT+FSATTRI=<filename>	Response 1)If successfully: +FSATTRI: <file_size> 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	String with or without double quotes, file name which is in current directory.
<file_size>	The size of specified file, and the unit is in Byte.

Examples

AT+FSATTRI=1.txt

+FSATTRI: 10

OK

5.2.5 AT+FSMEM Check the size of available memory

This command is used to check the size of available memory. The response will list total size and used size of local storage space if present and mounted. Support "C:" .

AT+FSMEM Check the size of available memory

Test Command AT+FSMEM=?	Response: OK
Execution Command AT+FSMEM	Response: 1)If successfully, currently C:/: +FSMEM: C:(<total>,<used>)

	OK 2)If failed:
	ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<total>	The total size of local storage space.
<used>	The used size of local storage space.

Examples

AT+FSMEM

+FSMEM: C: (344064, 102400)

OK

NOTE

The unit of storage space size is Byte.

5.2.6 AT+FSCOPY Copy an appointed file

This command is used to copy an appointed file on C:/ to an appointed directory on C:/, the new file name should give in parameter. Support "C:" .

AT+FSCOPY Copy an appointed file

Test Command AT+FSCOPY=?	Response OK
Write Command AT+FSCOPY=<file1>,<file2>[,<sync_mode>]	Response 1)If successfully, synchronous mode: +FSCOPY: <percent> [+FSCOPY: <percent>]

OK
 2)If successfully, asynchronous mode:
 OK

+FSCOPY: <percent>

[+FSCOPY: <percent>]

+FSCOPY: END
 3)If any error:
 FILE IS EXISTING
 FILE NOT EXISTING
 DIRECTORY NOT EXISTED
 EFS HAVE NO ENOUGH MEMORY
 FILE CREATE ERROR
 READ FILE ERROR
 WRITE FILE ERROR
 ERROR

Parameter Saving Mode -

Max Response Time -

Reference

Defined Values

<file1>	The sources file name or the whole path name with sources file name.
<file2>	The destination file name or the whole path name with destination file name.
<percent>	The percent of copy done. The range is 0.0 to 100.0
<sync_mode>	The execution mode of the command. The default value is 0. 0 synchronous mode 1 asynchronous mode

Examples

```
AT+FSCOPY=C:/TESTFILE,COPYFILE //Copy file TESTFILE on C:/ to C:/COPYFILE
+FSCOPY: 0.0

+FSCOPY: 9.7

+FSCOPY: 19.4

...
```

+FSCOPY: 100.0

OK

NOTE

The <file1> and <file2> should give the whole path and name, if only given file name, it will refer to current path and check the file's validity.

If <file2> is a whole path and name, make sure the directory exists, make sure that the file name does not exist or the file name is not the same name as the sub folder name, otherwise return error.

<percent> report refer to the copy file size. The big file maybe report many times, and little file report less.

If <sync_mode> is 1, the command will return OK immediately, and report final result with +FSCOPY: END.

5.2.7 AT+FSPRESET Moves the location of a file

This command is used to move an appointed file on C:/ to C:/simdir/, or from C:/simdir to C:/.

AT+FSPRESET Move the location of a file

Test Command AT+FSPRESET=?	Response OK
Write Command AT+ FSPRESET =<fileName>[,<direction>]	Response 1)If successfully OK 2)If error ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<fileName>	The file name to be moved without the path.
<direction>	The direction in which the file was moved <u>0</u> from root directory to the user directory 1 from user directory to the root directory

Examples

AT+FSPRESET=test.txt,0

//move file from root directory to the user directory

OK

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6 AT Commands for File Transmission

6.1 Overview of AT Commands for File Transmission

Command	Description
AT+CFTRANRX	Transfer a file to EFS
AT+CFTRANTX	Transfer a file from EFS to host

6.2 Detailed Description of AT Commands for File Transmission

6.2.1 AT+CFTRANRX Transfer a file to EFS

This command is used to transfer a file to EFS. Support "C:".

AT+CFTRANRX Transfer a file to EFS	
Test Command AT+CFTRANRX=?	Response +CFTRANRX: [{non-ascii}]"FILEPATH" OK
Write Command AT+CFTRANRX=<filepath>,<len>[,<location>]	Response 1)If successfully: > OK 2)If failed: > ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-

Reference

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the file data to send. Because of the system resources, the length could not set too large. The actual size could not ensure. Usually it is safer to set a smaller size.
<location>	The position offset from the start of the file.

Examples

```
AT+CFTRANRX="c:/t1.txt",10
>
OK
AT+CFTRANRX="c:/t1.txt",10,10
>
OK
```

NOTE

1. The <filepath> must be a full path with the directory path, make sure that the file name does not exist under the path.
2. If sending file fails, increase the delay time between each 256 byte reach to 50ms, and then try to send file again.
3. SIM7028 does not support Non-ASCII characters in file path.

6.2.2 AT+CFTRANTX Transfer a file from EFS to host

This command is used to transfer a file from EFS to host.

AT+CFTRANTX Transfer a file from EFS to host

Test Command AT+CFTRANTX=?	Response +CFTRANTX: [{non-ascii}]"FILEPATH" OK
--------------------------------------	--

Write Command AT+CFTRANTX=<filepath>[,<location>][, <size>]	Response 1)If successfully: [+CFTRANTX: DATA,<len> ... +CFTRANTX: DATA,<len>] +CFTRANTX: 0 OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the following file data to output.
<location>	The beginning of the file data to output.
<size>	The length of the file data to output.

Examples

```
AT+CFTRANTX="c:/t1.txt"
+CFTRANTX: DATA, 11
Testcontent
+CFTRANTX: 0

OK
```

NOTE

The <filepath> must be a full path with the directory path.
If not set the size, it means the range from location to the end of the file.
If the (size + location) is larger than the file size, it means the range from location to the end of the file.

7 AT Commands for TCP/IP

7.1 Overview of AT Commands for TCP/IP

Command	Description
AT+NETOPEN	Start Socket Service
AT+NETCLOSE	Stop Socket Service
AT+CIOPEN	Establish Connection in Multi-Socket Mode
AT+CIPSEND	Send data through TCP or UDP Connection
AT+CIPRXGET	Set the Mode to Retrieve Data
AT+CIPCLOSE	Close TCP or UDP Socket
AT+IPADDR	Inquire Socket PDP address
AT+CIPHEAD	Add an IP Header When Receiving Data
AT+CIPSRIP	Show Remote IP Address and Port
AT+CIPMODE	Set TCP/IP Application Mode
AT+CIPCCFG	Configure Parameters of Socket
AT+SERVERSTART	Startup TCP Sever
AT+SERVERSTOP	Stop TCP Sever
AT+CIPACK	Query TCP Connection Data Transmitting Status
AT+CDNSGIP	Query the IP Address of Given Domain Name
AT+CSOCKSETPN	Set active PDP context's profile

7.2 Detailed Description of AT Commands for TCP/IP

7.2.1 AT+NETOPEN Start Socket Service

AT+NETOPEN is used to start service by activating PDP context. You must execute AT+NETOPEN before any other TCP/UDP related operations.

AT+NETOPEN Start Socket Service

Read Command AT+NETOPEN?	Response +NETOPEN: <net_state> OK
Execute Command AT+NETOPEN	Response 1)If the PDP context has not been activated or the network closed abnormally, response: OK +NETOPEN: <err> 2)When the PDP context has been activated successfully, if you execute AT+NETOPEN again, response: +IP ERROR: Network is already opened ERROR 3)other: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms
Reference	3GPP TS 27.005

Defined Values

<net_state>	Integer type, indicates the state of PDP context activation. 0 network close (deactivated) 1 network open(activated)
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.

Examples

AT+NETOPEN?

+NETOPEN: 1

OK

AT+NETOPEN

OK

+NETOPEN: 0

7.2.2 AT+NETCLOSE Stop Socket Service

AT+NETCLOSE is used to stop service by deactivating PDP context. It can also close all the opened socket connections when you didn't close these connections by AT+CIPCLOSE.

AT+NETCLOSE Stop Socket Service	
Test Command AT+NETCLOSE=?	Response OK
Execute Command AT+NETCLOSE	Response 1)If the PDP context has been activated, response: OK +NETCLOSE: <err> 2)If the PDP context has been activated and one connection is in non-transparent mode and transparent mode, response: OK CLOSED +CIPCLOSE: <link_num>,<err> +NETCLOSE: <err> 3)If the PDP context has not been activated, response: +NETCLOSE: <err> ERROR 4)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms
Reference	

Defined Values

<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.
--------------------	--

Examples

AT+NETCLOSE

OK

+NETCLOSE: 0

7.2.3 AT+CIOPEN Establish Connection in Multi-Socket Mode

You can use AT+CIOPEN to establish a connection with TCP server and UDP server, the maximum of the connections is 2.

AT+CIOPEN Establish Connection in Multi-Socket Mode

<p>Test Command AT+CIOPEN=?</p>	<p>Response +CIOPEN: (0-1),("TCP","UDP")</p> <p>OK</p>
<p>Read Command AT+CIOPEN?</p>	<p>Response +CIOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>] +CIOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>] [...]</p> <p>OK</p> <p>If a connection identified by <link_num> has not been established successfully, only +CIOPEN: <link_num> will be returned.</p>
<p>Write Command TCP connection AT+CIOPEN=<link_num>,"TCP",<serverIP>,<serverPort>[,<localPort>]</p>	<p>Response</p> <p>1)if PDP context has been activated successfully, response: OK</p> <p>+CIOPEN: <link_num>,<err></p> <p>2)when the <link_num> is greater than 2, response: +IP ERROR: Invalid parameter</p> <p>ERROR</p> <p>3)If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or when AT+CIPMODE=1 is set, the <link_num> is greater than 0, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR</p>

	<p>4)Transparent mode for TCP connection: When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. if success CONNECT [<text>] if failure CONNECT FAIL</p> <p>5)Others: ERROR</p>
<p>Write Command UDP Connection AT+CIOPEN=<link_num>,"UDP",,,<localPort></p>	<p>1)If PDP context has been activated successfully, response: +CIOPEN: <link_num>,0</p> <p>OK</p> <p>2)When the <link_num> is greater than 2, response: +IP ERROR: Invalid parameter</p> <p>ERROR If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR</p> <p>3)Others: ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>Range: 3000ms-120000ms default: 120000ms</p>
<p>Reference</p>	

Defined Values

<p><link_num></p>	<p>Integer type, identifies a connection. Range is 0-1. If AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0.</p>
<p><type></p>	<p>String type, identifies the type of transmission protocol. TCP Transmission Control Protocol UDP User Datagram Protocol</p>
<p><serverIP></p>	<p>String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here.</p>
<p><serverPort></p>	<p>Integer type, identifies the port of TCP server, range is 0-65535. NOTE: When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port.</p>

<localPort>	Integer type, identifies the port of local socket, range is 0-65535.
<index>	Integer type, indicates whether the module is used as a client or server. When used as server, the range is 0-3,<index> is the server index to which the client is linked. -1 TCP client 0-3 TCP server index
<text>	String type, indicates CONNECT result code.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.

Examples

AT+CIOPEN=?

+CIOPEN: (0-1),("TCP","UDP")

OK

AT+CIOPEN?

+CIOPEN: 0

+CIOPEN: 1,"TCP","183.230.174.137",6031,-1

OK

AT+CIOPEN=0,"TCP","183.230.174.137",6031

OK

//TCP connection

+CIOPEN: 0,0

AT+CIOPEN=1,"UDP",,,6031

+CIOPEN: 1,0

// UDP Connection

OK

7.2.4 AT+CIPSEND Send data through TCP or UDP Connection

AT+CIPSEND is used to send data to remote side. If service type is TCP, the data is firstly sent to the module's internal TCP/IP stack, and then sent to server by protocol stack. The <length> field may be empty. While it is empty, each <Ctrl+Z> character present in the data should be coded as <ETX><Ctrl+Z>. Each <ESC> character present in the data should be coded as <ETX><ESC>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the input data. Single <ESC> is used to cancel the sending.

<ETX> is 0x03, and <Ctrl+Z> is 0x1A,<ESC> is 0x1B.

AT+CIPSEND Send data through TCP or UDP Connection

Test Command
AT+CIPSEND=?

Response
+CIPSEND: (0-1),(1-1500)

OK

Write Command
If service type is "TCP", send data with changeable length
AT+CIPSEND=<link_num>

Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation

Response
1)If the connection identified by <link_num> has been established successfully, response:

>
<input data>

CTRL+Z

OK

+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>

2)If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.

3)If the connection has not been established, abnormally closed, or parameter is incorrect, response:

+CIPERROR: <err>

ERROR

4)Others:

ERROR

Write Command
If service type is "TCP", send data with fixed length
AT+CIPSEND=<link_num>,<length>

Response
1)If the connection identified by <link_num> has been established successfully, response:

>
<input data with specified length>

OK

+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>

2)If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.

3)If the connection has not been established, abnormally closed, or parameter is incorrect, response:

+CIPERROR: <err>

ERROR

4)Others:

ERROR

Write Command
If service type is "UDP", send data with changeable length

Response
1)If the connection identified by <link_num> has been established successfully, response:

>

<p>AT+CIPSEND=<link_num>,,<serverIP>,<serverPort>,<raiFlag></p> <p>Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation</p>	<p><input data> CTRL+Z OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p>
<p>Write Command If service type is "UDP", send data with fixed length</p> <p>AT+CIPSEND=<link_num>,<length>,<serverIP>,<serverPort>,<raiFlag></p> <p>Response ">", type data until the data length is equal to <length></p>	<p>Response</p> <p>1)If the connection identified by <link_num> has been established successfully, response: > <input data with specified length> OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>Range: 3000ms-120000ms default: 120000ms</p>
<p>Reference</p>	

Defined Values

<p><link_num></p>	<p>Integer type, identifies a connection. Range is 0-1.</p>
<p><length></p>	<p>Integer type, indicates the length of sending data, range is 1-1500.</p>
<p><serverIP></p>	<p>String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here.</p>
<p><serverPort></p>	<p>Integer type, identifies the port of TCP server, range is 0-65535. NOTE: When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port.</p>

	But, for Qualcomm, connecting the port 0 is regarded as an invalid operation.
<raiFlag>	is used by the UE to request the NB-IOT network to quickly release the current RRC connect. 0 No information available 1 UE sends one UL packet and no DL packet is expected, then the NB-IOT network quickly releases the current RRC connect. 2 UE sends one UL packet and DL packet is expected, then the NB-IOT network quickly releases the current RRC connect.
<reqSendLength>	Integer type, the length of the data requested to be sent
<cnfSendLength>	Integer type, the length of the data confirmed to have been sent -1 the connection is disconnected. 0 own send buffer or other side's congestion window are full. Note: If the <cnfSendLength> is not equal to the <reqSendLength>, the socket then cannot be used further.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.

Examples

AT+CIPSEND=?

+CIPSEND: (0-1),(1-1500)

OK

AT+CIPSEND=1,5

>12345

OK

// If service type is "TCP", send data with fixed length

+CIPSEND: 1,5,5

AT+CIPSEND=1,5,"183.230.174.137",6031

>12345

OK

// If service type is "UDP", send data with fixed length

+CIPSEND: 1,5,5

NOTE

If you use UDP to send more than 1400 bytes of data when the server does not receive data, this may be the reason for the carrier, in this case please send no more than 1400 bytes of data.

If you use TCP to send data, the instruction can be followed by a comma just like "AT+CIPSEND=0," or "AT+CIPSEND=0,10," without an error, but it doesn't make any sense

7.2.5 AT+CIPRXGET Set the Mode to Retrieve Data

If set <mode> to 1, after receiving data, the module will buffer it and report a URC as "+CIPRXGET: 1,<link_num>" to notify the host. Then host can retrieve data by AT+CIPRXGET.

If set <mode> to 0, the received data will be outputted to COM port directly by URC as "RCV FROM:<IP ADDRESS>:<PORT><CR><LF>+IPD(data length)<CR><LF><data>".

The default value of <mode> is 0.

AT+CIPRXGET Set the Mode to Retrieve Data

Test Command AT+CIPRXGET=?	Response +CIPRXGET: (0-4),(0-1),(1-1500) OK
Read Command AT+CIPRXGET?	Response +CIPRXGET: <mode> OK
Write Command AT+CIPRXGET=<mode> In this case,<mode> can only be 0 or 1	Response 1)If the parameter is correct, response: OK 2)If the parameter is incorrect, response: +IP ERROR: <err_info> ERROR 3)Others: ERROR
Write Command AT+CIPRXGET=2,<link_num>[,<len>] Retrieve data in ACSII form	Response 1)If <len> field is empty, the default value to read is 1500. If the buffer is not empty, response: +CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len> <data>ACSII form OK 2)If the buffer is empty, response: +IP ERROR: No data ERROR 3)If the parameter is incorrect, response: +IP ERROR: <err_info>

<p>Write Command AT+CIPRXGET=3,<link_num>[,<len>] Retrieve data in hex form</p>	<p>ERROR 4)Others: ERROR</p> <p>Response 1)If <length> field is empty, the default value to read is 750. If the buffer is not empty, response: +CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len> <data> hex form</p> <p>OK 2)If the buffer is empty, response: +IP ERROR: No data</p> <p>ERROR 3)If the parameter is incorrect, response: +IP ERROR: <err_info></p> <p>ERROR 4)Others:</p>
<p>Write Command AT+CIPRXGET=4,<link_num></p>	<p>Response 1)If the parameter is correct, response: +CIPRXGET: 4,<link_num>,<rest_len></p> <p>OK 2)If the parameter is incorrect, response: +IP ERROR: <err_info></p> <p>ERROR 3)Others</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>8s</p>
<p>Reference</p>	

Defined Values

<p><mode></p>	<p>Integer type, sets the mode to retrieve data</p> <ul style="list-style-type: none"> <u>0</u> set the way to get the network data automatically 1 set the way to get the network data manually 2 read data, the max read length is 1500
----------------------------	--

	3 read data in HEX form, the max read length is 750 4 get the rest data length
<link_num>	Integer type, identifies a connection. Range is 0-1.
<len>	Integer type, the data length to be read. Not required, the default value is 1500 when <mode>=2, and 750 when <mode>=3.
<read_len>	Integer type, the length of data that has been read.
<rest_len>	Integer type, the length of data which has not been read in the buffer.
<err_info>	String type, displays the cause of occurring error, please refer to the end of this chapter for details.

Examples

AT+CIPRXGET=?

+CIPRXGET: (0-4),(0-1),(1-1500)

OK

AT+CIPRXGET?

+CIPRXGET: 1

OK

AT+CIPRXGET=1

OK

AT+CIPRXGET=2,0

+CIPRXGET: 2,0,6,0

123456

OK

AT+CIPRXGET=3,0

+CIPRXGET: 3,0,6,0

313233343536

OK

AT+CIPRXGET=4,0

+CIPRXGET: 4,0,18

OK

NOTE

When data is received and reported, the maximum length of <data length> is 1500 each time.

7.2.6 AT+CIPCLOSE Close TCP or UDP Socket

AT+CIPCLOSE is used to close a TCP or UDP Socket

AT+CIPCLOSE Close TCP or UDP Socket	
Test Command AT+CIPCLOSE=?	Response +CIPCLOSE: (0-1) OK
Read Command AT+CIPCLOSE?	Response +CIPCLOSE: <link0_state>,<link1_state> OK
Write Command AT+CIPCLOSE=<link_num>	Response 1)If service type is TCP and the connection identified by <link_num> has been established, response OK +CIPCLOSE: <link_num>,<err> 2)If service type is TCP and the access mode is transparent mode, response: OK CLOSED +CIPCLOSE: <link_num>,<err> 3)If service type is UDP and the connection identified by <link_num> has been established and closed successfully, response: +CIPCLOSE: <link_num>,0 OK 4)If service type is UDP and access mode is transparent mode, response: CLOSED +CIPCLOSE: <link_num>,<err> OK 5)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPCLOSE: <link_num>,<err>

	ERROR 6)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms
Reference	

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-1.
<linkX_state>	Integer type, indicates state of connection identified by <link_num>. Range is 0-1. 0 disconnected 1 connected
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.

Examples

```
AT+CIPCLOSE=?
+CIPCLOSE: (0-1)
```

```
OK
AT+CIPCLOSE?
+CIPCLOSE: 0,0
```

```
OK
AT+CIPCLOSE=0
OK
+CIPCLOSE: 0,0
```

7.2.7 AT+IPADDR Inquire Socket PDP address

AT+IPADDR is used to get active PDP address.

AT+IPADDR Inquire Socket PDP Address

Test Command AT+IPADDR=?	Response OK
Execute Command AT+IPADDR	Response 1)If PDP context has been activated successfully, response +IPADDR: <ip_address> 2) +IP ERROR: Network not opened ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<ip_address> String type, identifies the IP address of current active socket PDP.

Examples

```
AT+IPADDR
+IPADDR: 10.84.17.161
```

```
OK
```

7.2.8 AT+CIPHEAD Add an IP Header When Receiving Data

AT+CIPHEAD is used to add an IP header when receiving data.

AT+CIPHEAD Add an IP Header When Receiving Data

Test Command AT+CIPHEAD=?	Response +CIPHEAD: (0-1) OK
Read Command AT+CIPHEAD?	Response +CIPHEAD: <mode> OK

Write Command AT+CIPHEAD=<mode>	Response 1)If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPHEAD	Response Set default value:(<mode>=1) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, indicates whether adding an IP header or not when receiving data 0 not add IP header <u>1</u> add IP header, the format is "+IPD(data length)"
--------	--

Examples

```
AT+CIPHEAD=?
+CIPHEAD: (0-1)
```

```
OK
AT+CIPHEAD?
+CIPHEAD: 1
```

```
OK
AT+CIPHEAD=1
OK
AT+CIPHEAD
OK
```

7.2.9 AT+CIPSRIP Show Remote IP Address and Port

AT+CIPSRIP is used to set whether to display IP address and port of server when receiving data.

AT+CIPSRIP Show Remote IP Address and Port

Test Command	Response
--------------	----------

AT+CIPSRIP=?	+CIPSRIP: (0-1)
	OK
Read Command AT+CIPSRIP?	Response +CIPSRIP: <mode>
	OK
Write Command AT+CIPSRIP=<mode>	Response 1)If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPSRIP	Response Set default value:(<mode>=1) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, indicates whether to show IP address and port of server or not when receiving data. 0 not show <u>1</u> show, the format is as follows: "RCV FROM:<IP ADDRESS>:<PORT>"
---------------------	---

Examples

AT+CIPSRIP=?
+CIPSRIP: (0-1)

OK
AT+CIPSRIP?
+CIPSRIP: 1

OK
AT+CIPSRIP=0
OK
AT+CIPSRIP
OK

7.2.10 AT+CIPMODE Set TCP/IP Application Mode

AT+CIPMODE is used to select transparent mode(data mode) or non-transparent mode(command mode).The default mode is non-transparent mode.

AT+CIPMODE Set TCP/IP Application Mode	
Test Command AT+CIPMODE=?	Response +CIPMODE: (0-1) OK
Read Command AT+CIPMODE?	Response +CIPMODE: <mode> OK
Write Command AT+CIPMODE=<mode>	Response 1)If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPMODE	Response Set default value:(<mode>=0) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, sets TCP/IP application mode <u>0</u> Non transparent mode 1 Transparent mode
--------	---

Examples

```
AT+CIPMODE=?
+CIPMODE: (0-1)

OK
AT+CIPMODE?
+CIPMODE: 0

OK
```

AT+CIPMODE=1

OK

AT+CIPMODE

OK

NOTE

When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN.

7.2.11 AT+CIPCCFG Configure Parameters of Socket

AT+CIPCCFG is used to configure parameters of socket.

AT+CIPCCFG Configure Parameters of Socket

Test Command AT+CIPCCFG=?	Response +CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000)
	OK
Read Command AT+CIPCCFG?	Response +CIPCCFG: <NmRetry>,<DelayTm>,<Ack>,<errMode>,<Header-Type>,<AsyncMode>,<TimeoutVal>
	OK
Write Command AT+CIPCCFG=[<NmRetry>][,<DelayTm>][,<Ack>][,<errMode>][,<HeaderType>][,<AsyncMode>][,<TimeoutVal>]]]]]]]]	Response 1)If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPCCFG	Response Set default value: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<NmRetry>	Integer type, number of retransmission to be made for an IP packet. Range is 0-10. The default value is 10.
<DelayTm>	Integer type, number of milliseconds to delay to output data of Receiving. Range is 0-1000. The default value is 0.
<Ack>	Integer type, it can only be set to 0. It's used to be compatible with old TCP/IP command set.
<errMode>	Integer type, sets mode of reporting <err_info>, default value is 1. 0 error result code with numeric values 1 error result code with string values
<HeaderType>	Integer type, select which data header is used when receiving data, it only takes effect in multi-client mode. Default value is 0. 0 add data header, the format is "+IPD<data length>" 1 add data header, the format is "+RECEIVE,<link num>,<data length>"
<AsyncMode>	Integer type, range is 0-1. Default value is 0. It's used to be compatible with old TCP/IP command set.
<TimeoutVal>	Integer type, set the minimum retransmission timeout value for TCP connection. Range is 500ms-120000ms. Default is 500ms.

Examples

```

AT+CIPCCFG=?
+CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000)

OK
AT+CIPCCFG?
+CIPCCFG: 10,0,0,1,0,0,500

OK
AT+CIPCCFG=2
OK
AT+CIPCCFG
OK
  
```

7.2.12 AT+SERVERSTART Startup TCP Sever

AT+SERVERSTART is used to startup a TCP server, and the server can receive the request of TCP client. After the command executes successfully, an unsolicited result code is returned when a client tries to connect with module and module accepts request. The unsolicited result code is+CLIENT:
<link_num>,<server_index>,<client_IP>:<port>.

AT+SERVERSTART Startup TCP Sever

Test Command AT+SERVERSTART=?	Response +SERVERSTART: (1-65535),(0-1) OK
Read Command AT+SERVERSTART?	Response 1)If the PDP context has not been activated successfully, response: +CIPERROR: <err> ERROR 2)If there exists opened server, response: [+SERVERSTART: <server_index>,<port> ...] OK 3)Others: ERROR
Write Command AT+SERVERSTART=<port>,<server_index>[,<backlog>]	Response 1)If there is no error, response: OK 2)If the PDP context has not been activated, or the server identified by <server_index> has been opened, or the parameter is not correct, or other errors, response: +CIPERROR: <err> ERROR 3)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<port>	Integer type, identifies the listening port of module when used as a TCP server. Range is 1-65535.
<server_index>	Integer type, the TCP server index, range is 0-1.
<backlog>	Integer type, the maximum connections can be queued in listening queue. Range is 1-3. Default is 3.

Examples

AT+SERVERSTART=?

+SERVERSTART: (1-65535),(0-1)

OK

AT+SERVERSTART?

OK

AT+SERVERSTART=8080,0

OK

7.2.13 AT+SERVERSTOP Stop TCP Sever

AT+SERVERSTOP is used to stop TCP server. Before stopping a TCP server, all sockets <server_index> of which equals to the closing TCP server index must be closed first.

AT+SERVERSTOP Stop TCP Sever

Write Command

AT+SERVERSTOP=<server_index>

Response

1)If there exists open connection with the server identified by <server_index>, or the server identified by <server_index> has not been opened, or the parameter is incorrect, response:

+SERVERSTOP: <server_index>,<err>

ERROR

2)If the server socket is closed immediately, response:

+SERVERSTOP: <server_index>,0

OK

(In general, the result is shown as below.)

3)If the server socket starts to close, response:

OK

+SERVERSTOP: <server_index>,<err>

4)Others:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

<server_index>

Integer type, the TCP server index, range is 0-1.

<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to the end of this chapter for details.
--------------------	--

Examples

AT+SERVERSTOP=0

OK

+SERVERSTOP: 0,0

7.2.14 AT+CIPACK Query TCP Connection Data Transmitting Status

AT+CIPACK is used to query TCP connection data transmitting status.

AT+CIPACK Query Connection Data Transmitting State

Test Command AT+CIPACK=?	Response +CIPACK: (range of supported <link_num>s) OK
Write Command AT+CIPACK=<link_num>	Response 1)If the PDP context has not been activated, or the connection identified by <link_num> has not been established, abnormally closed, or the parameter is incorrect, or other errors, response: +IP ERROR: <err_info> ERROR 2)If the connection has been established, and the service type is "TCP", response: +CIPACK: <sent_data_size>,<ack_data_size>,<recv_data_size> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-1.
<sent_data_size>	Integer type, the total length of sent data

<ack_data_size>	Reserve. SIM7028 does not support querying ACK data. The ack field is reserved as 0
<recv_data_size>	Integer type, the total length of received data
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 5.3.2 for details
<err_info>	String type, displays the cause of occurring error, please refer to the end of this chapter for details.

Examples

AT+CIPACK=?

+CIPACK: (0-1)

OK

AT+CIPACK=0

+CIPACK: 10,0,5

OK

7.2.15 AT+CDNSGIP Query the IP Address of Given Domain Name

AT+CDNSGIP is used to query the IP address of given domain name.

AT+CDNSGIP Query the IP Address of Given Domain Name

Test Command	Response
AT+CDNSGIP=?	OK
Write Command AT+CDNSGIP=<domain name>	Response 1)If the given domain name has related IP, response: +CDNSGIP: 1,<domain name>,<IP address> OK 2)If the given name has no related IP, response: +CDNSGIP: 0,<dns error code> ERROR 3)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	60000ms
Reference	-

Defined Values

<domain name>	String type (string should be included in quotation marks), indicates the domain name. The maximum length of domain name is 254. Valid characters allowed in the domain name area include a-z, A-Z, 0-9, "-" (hyphen) and ".". A domain name is made up of one label name or more label names separated by "." (eg: AT+CDNSGIP="aa.bb.cc"). For label names separated by ".", length of each label must be no more than 63 characters. The beginning character of the domain name and of labels should be an alphanumeric character.
<IP address>	String type, indicates the IP address corresponding to the domain name.
<dns error code>	Integer type, indicates the error code. 10 DNS GENERAL ERROR

Examples

```

AT+CDNSGIP=?
OK
AT+CDNSGIP="www.baidu.com"
+CDNSGIP: 1,"www.baidu.com","61.135.169.121"
OK

```

7.2.16 AT+CTCPKA Conigure TCP heartbeat

This command is used to set TCP heartbeat parameters. Set this up after we activate PDP by using AT+NETOPEN command.

AT+CTCPKA Conigure TCP heartbeat

Test Command AT+CTCPKA=?	Response OK
Read Command AT+CTCPKA?	Response +CTCPKA: <keepalive>,<keepidle>,<keepcount>,<keepinterval> OK
Write Command AT+CTCPKA=<keepalive>,<keepidle>,<keepcount>,<keepinterval>	Response 1)If successfully: OK 2)If failed:

	ERROR
Parameter Saving Mode	NO_SAVE
Maximum Response Time	default: 9000ms
Reference	-

Defined Values

<keepalive >	Set TCP keepalive option. Default is 0. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism
<keepidle>	The unit is minute. If there is no data interaction within this period, the probe is performed. (1-120) Default is 120.
<keepcount>	Number of probe retries. If all times out, the connection is considered Invalid.(1-10) Default is 10.
<keepinterval>	The unit is minute. Interval for sending probe packets during probe. Default is 1.

Examples

```
AT+CTCPKA=1,2,5,1
```

```
OK
```

```
AT+CTCPKA?
```

```
+CTCPKA: 1,2,5,1
```

```
OK
```

7.2.17 AT+CDNSCFG Configure Domain Name Server

This command is used to configure Domain Name Server.

AT+CDNSCFG Configure Domain Name Server

Test Command AT+CDNSCFG =?	Response +CDNSCFG: ("Primary DNS"),("Secondary DNS"),type
	OK
Read Command AT+CDNSCFG?	Response Primary IPv4 DNS: <pri_dns>,Secondary IPv4 DNS: <pri_dns> Primary IPv6 DNS: <pri_dns>,Secondary IPv6 DNS: <pri_dns>
Write Command	OK Response

AT+CDNSCFG=<pri_dns>[,<sec_dns>][,<type>]	1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Maximum Response Time	default: 9000ms
Reference	-

Defined Values

<pri_dns>	A string parameter which indicates the IP address of the primary domain name server.
<sec_dns>	A string parameter which indicates the IP address of the secondary domain name server.
<type>	0 Set the server for the ipv4 network 1 Set the server for the ipv6 network

Examples

AT+CDNSCFG?

Primary IPv4 DNS: 183.230.126.224,Secondary IPv4 DNS: 183.230.126.225

Primary IPv6 DNS: 2409:8060:20EA:101::1,Secondary IPv6 DNS: 2409:8060:20EA:201::1

OK

AT+CDNSCFG=183.230.126.224,183.230.126.225,0

OK

7.3 Command Result Codes

7.3.1 Description of <err_info>

The fourth parameter <errMode> of AT+CIPCCFG (TODO)is used to determine how <err_info> is displayed.

If <errMode> is set to 0, the <err_info> is displayed with numeric value.

If <errMode>is set to 1, the <err_info> is displayed with string value.

The default is displayed with string value.

Numeric Value	String Value
0	Connection time out
1	Bind port failed
2	Port overflow
3	Create socket failed
4	Network is already opened
5	Network is already closed
6	No clients connected
7	No active client
8	Network not opened
9	Client index overflow
10	Connection is already created
11	Connection is not created
12	Invalid parameter
13	Operation not supported
14	DNS query failed
15	TCP busy
16	Net close failed for socket opened
17	Sending time out
18	Sending failure for network error
19	Open failure for network error
20	Server is already listening
21	Operation failed
22	No data

7.3.2 Description of <err>

<err>	Description of <err>
0	operation succeeded
1	Network failure
2	Network not opened
3	Wrong parameter
4	Operation not supported
5	Failed to create socket
6	Failed to bind socket
7	TCP server is already listening
8	Busy

9	Sockets opened
10	Timeout
11	DNS parse failed for AT+CIOPEN
12	Unknown error

7.4 Unsolicited Result Codes

URC	Description
+CIPEVENT: NETWORK CLOSED UNEXPECTEDLY	Network is closed for network error(Out of service, etc). When this event happens, user's application needs to check and close all opened sockets, and then uses AT+NETCLOSE to release the network library if AT+NETOPEN? shows the network library is still opened.
+IPCLOSE: <client_index>,<close_reason>	Socket is closed passively. <client_index> is the link number. <close_reason>: 0 Closed by local, active 1 Closed by remote, passive 2 Closed for sending timeout or DTR off
+CLIENT: <link_num>,<server_index>,<client_IP>:<port>	TCP server accepted a new socket client, the index is<link_num>, the TCP server index is <server_index>. The peer IP address is <client_IP>, the peer port is <port>.

8 AT Commands for NTP

8.1 Overview of AT Commands for NTP

Command	Description
AT+CNTP	Update system time via the NTP(Network Time Protocol)

8.2 Detailed Description of AT Commands for NTP

8.2.1 AT+CNTP Update system time via the NTP(Network Time Protocol)

AT+CNTP Update system time via the NTP(Network Time Protocol)	
Test Command AT+CNTP=?	Response +CNTP: "HOST",(-96~96) OK
Read Command AT+CNTP?	Response +CNTP: <host>,<timezone> OK
Write Command AT+CNTP=<host>[,<timezone>]	Response 1) If the parameters is correct: OK 2) Else ERROR
Execute Command AT+CNTP	Response 1) If update the time successfully: OK +CNTP: 0

	2) If update the time failed: OK
	+CNTP: <err_code>
	3) Other errors occur: ERROR
Parameter Saving Mode	None
Max Response Time	5000ms
Reference	-

Defined Values

<host>	NTP server address, length is 0-255.
<timezone>	Local time zone,the range is (-96 to 96), default value is 32.

Examples

```

AT+CNTP="120.25.115.20",32 // set the NTP server and local time zone
OK
AT+CNTP // execute the update operation
OK
+CNTP: 0

```

8.3 Command Result Codes

8.3.1 Description of <err> of NTP

<err>	Description
0	Operation succeeded
1	Unknown error
2	Wrong parameter
3	Wrong date and time calculated
4	Network error
5	Time zone error
6	Time out error

9 AT Commands for SSL

9.1 Overview of AT Commands for SSL

Command	Description
AT+CSSLCFG	Configure the SSL Context
AT+CCERTDOWN	Download certificate into the module
AT+CCERTLIST	List certificates
AT+CCERTDELE	Delete certificates
AT+CCHSET	Configure the report mode of sending and receiving data
AT+CCHSTART	Start SSL service
AT+CCHSTOP	Stop SSL service
AT+CCHCFG	Configure the context
AT+CCHOPEN	Connect to the special server
AT+CCHCLOSE	Disconnect from the special server
AT+CCHSEND	Send data to the special server
AT+CCHRECV	Read the cached data that received from the server

9.2 Detailed Description of AT Commands for SSL

9.2.1 AT+CSSLCFG Configure the SSL Context

AT+CSSLCFG Configure the SSL Context	
Response	
Test Command	+CSSLCFG: "sslversion",(0-1),(0-4)
AT+CSSLCFG=?	+CSSLCFG: "authmode",(0-1),(0-3)
	+CSSLCFG: "ignorelocaltime",(0-1),(0,1)
	+CSSLCFG: "negotiatetime",(0-1),(10-300)
	+CSSLCFG: "cacert",(0-1),(1-53)

	<p>+CSSLCFG: "clientcert",(0-1),(1-53) +CSSLCFG: "clientkey",(0-1),(1-53) +CSSLCFG: "enableSNI",(0-1),(0,1) +CSSLCFG: "ciphersuites",(0-1),(0x002F,0Xffff)</p> <p>OK</p>
<p>Read Command AT+CSSLCFG?</p>	<p>Response</p> <p>+CSSLCFG: 0,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<enableSNI>,<ciphersuites> +CSSLCFG: 1,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<enableSNI>,<ciphersuites></p> <p>OK</p>
<p>Write Command /*Configure the version of the specified SSL context*/ AT+CSSLCFG="sslversion",<ssl_ctx_index>,<sslversion></p>	<p>Response</p> <p>1)If successfully: OK 2)If failed: ERROR</p>
<p>Write Command /*Configure the authentication mode of the specified SSL context*/ AT+CSSLCFG="authmode",<ssl_ctx_index>,<authmode></p>	<p>Response</p> <p>1)If successfully: OK 2)If failed: ERROR</p>
<p>Write Command /*Configure the ignore local time flag of the specified SSL context*/ AT+CSSLCFG="ignorelocaltime",<ssl_ctx_index>,<ignoreltime></p>	<p>Response</p> <p>1)If successfully: OK 2)If failed: ERROR</p>
<p>Write Command /*Configure the negotiate timeout value of the specified SSL context*/ AT+CSSLCFG="negotiatetime",<ssl_ctx_index>,<negotiatetime></p>	<p>Response</p> <p>1)If successfully: OK 2)If failed: ERROR</p>
<p>Write Command /*Configure the server root CA of the specified SSL context*/</p>	<p>Response</p> <p>1)If successfully: OK</p>

AT+CSSLCFG="cacert",<ssl_ctx_index>,<ca_file>	2)If failed: ERROR
Write Command /*Configure the client certificate of the specified SSL context*/ AT+CSSLCFG="clientcert",<ssl_ctx_index>,<clientcert_file>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the client key of the specified SSL context*/ AT+CSSLCFG="clientkey",<ssl_ctx_index>,<clientkey_file>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the enableSNI flag of the specified SSL context */ AT+CSSLCFG="enableSNI",<ssl_ctx_index>,<enableSNI_flag>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the ciphersuite of the specified SSL context*/ AT+CSSLCFG="ciphersuites",<ssl_ctx_index>,<ciphersuites>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<ssl_ctx_index>	The SSL context ID. The range is 0-1.
<sslversion>	The SSL version, the default value is 4. 0 SSL3.0 1 TLS1.0 2 TLS1.1 3 TLS1.2 4 All The configured version should be support by server.
<authmode>	The authentication mode, the default value is 0. 0 no authentication. 1 server authentication. It needs the root CA of the server.

	<p>2 server and client authentication. It needs the root CA of the server, the cert and key of the client.</p> <p>3 reserve</p>
<ignoreltime>	<p>The flag to indicate how to deal with expired certificate, the default value is 1.</p> <p>0 care about time check for certification.</p> <p>1 ignore time check for certification.</p>
<negotiatetime>	<p>The timeout value used in SSL negotiate stage. The range is 10-300 seconds. The default value is 300.</p>
<ca_file>	<p>The root CA file name of SSL context. The length of filename is from 1 to 53 bytes.</p>
<clientcert_file>	<p>The client cert file name of SSL context. The length of filename is from 1 to 53 bytes.</p>
<clientkey_file>	<p>The client key file name of SSL context. The length of filename is from 1 to 53 bytes.</p>
<enableSNI_flag>	<p>The flag to indicate that enable the SNI extension or not, the default value is 1.</p> <p>0 not enable.</p> <p>1 enable.</p>
<ciphersuites>	<p>Numeric type, SSL ciphersuites</p> <p>0X002F TLS_RSA_WITH_AES_128_CBC_SHA</p> <p>0XFFFF Support all</p>

Examples

AT+CSSLCFG=?

```
+CSSLCFG: "sslversion",(0-1),(0-4)
+CSSLCFG: "authmode",(0-1),(0-3)
+CSSLCFG: "ignorelocaltime",(0-1),(0,1)
+CSSLCFG: "negotiatetime",(0-1),(10-300)
+CSSLCFG: "cacert",(0-1),(1-53)
+CSSLCFG: "clientcert",(0-1),(1-53)
+CSSLCFG: "clientkey",(0-1),(1-53)
+CSSLCFG: "enableSNI",(0-1),(0,1)
```

OK

AT+CSSLCFG?

```
+CSSLCFG: 0,4,0,1,300,"", "", "", 1
+CSSLCFG: 1,4,0,1,300,"", "", "", 1
```

OK

AT+CSSLCFG="authmode",0,0

OK

9.2.2 AT+CCERTDOWN Download certificate into the module

AT+CCERTDOWN Download certificate into the module

Test Command AT+CCERTDOWN=?	Response +CCERTDOWN: (1-53),(1-10240)
Write Command AT+CCERTDOWN=<filename>,<len>	<p>Response</p> <p>1)If parameter is ok and receive enough data within max response time: ><input data></p> <p>OK</p> <p>2)If parameter is ok and do not receive enough data within max response time: ><input data></p> <p>ERROR</p> <p>2) If parameter is error: ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The name of the cacert/clientcert/clientkey file. The length of filename is from 1 to 53 bytes.
<len>	The length of the file data to send. The range is from 1 to 10240 bytes.

Examples

```

AT+CCERTDOWN=?
+CCERTDOWN: (1-53),(1-10240)

OK
AT+CCERTDOWN="baidu.der",889
><input data>

```


OK

9.2.3 AT+CCERTLIST List certificates

AT+CCERTLIST List certificates

Test Command AT+CCERTLIST=?	Response OK
Execute Command AT+CCERTLIST	Response +CCERTLIST: <filename> ... +CCERTLIST: <filename> OK
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<filename>	The name of the cacert/clientcert/clientkey file. The length of filename is from 1 to 53 bytes.
-------------------------	---

Examples

AT+CCERTLIST

+CCERTLIST: "baidu.der"

OK

9.2.4 AT+CCERTDELE Delete certificates

AT+CCERTDELE Delete certificates

Test Command AT+CCERTDELE=?	Response OK
Write Command AT+CCERTDELE=<filename>	Response 1) If remove the file successfully:

	OK 2) Else ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<filename>	The name of the cacert/clientcert/clientkey file. The length of filename is from 1 to 53 bytes.
------------	---

Examples

AT+CCERTLIST

```
+CCERTLIST: "baidu.der"
```

OK

```
AT+CCERTDELETE="baidu.der "
```

OK

```
AT+CCERTLIST
```

OK

9.2.5 AT+CCHSET Configure the report mode of sending and receiving data

AT+CCHSET is used to configure the mode of sending and receiving data. It must be called before AT+CCHSTART.

AT+CCHSET Configure the report mode of sending and receiving data

Test Command AT+CCHSET=?	Response +CCHSET: (0-1),(0-1)
Read Command AT+CCHSET?	OK Response +CCHSET: <report_send_result>,<recv_mode>
Write Command AT+CCHSET=<report_send_res	OK Response 1) If successfully:

<code>ult>[,<recv_mode>]</code>	<p>OK</p> <p>2) If failed:</p> <p>ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<code><report_send_result></code>	<p>Whether to report result of CCHSEND, the default value is 0:</p> <p>0 No.</p> <p>1 Yes. Module will report +CCHSEND: <session_id>,<err> to MCU when complete sending data.</p>
<code><recv_mode></code>	<p>The receiving mode, the default value is 0:</p> <p>0 Output the data to MCU whenever received data.</p> <p>1 Module caches the received data and notifies MCU with +CCHEVENT: <session_id>, RECV EVENT.</p> <p>MCU can use AT+CCHRECV to receive the cached data (only in manual receiving mode).</p>

Examples

AT+CCHSET=?

+CCHSET: (0,1),(0,1)

OK

AT+CCHSET?

+CCHSET: 0,0

OK

AT+CCHSET=1,1

OK

9.2.6 AT+CCHSTART Start SSL service

AT+CCHSTART is used to start SSL service. You must execute AT+CCHSTART before any other SSL related operations.

AT+CCHSTART Start SSL service

Test Command	Response
AT+CCHSTART=?	OK

Execute Command AT+CCHSTART	Response 1)If start SSL service successfully: OK +CCHSTART: 0 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Examples

AT+CCHSTART

OK

+CCHSTART: 0

9.2.7 AT+CCHSTOP Stop SSL service

AT+CCHSTOP Stop SSL service

Test Command AT+CCHSTOP=?	Response OK
Execute Command AT+CCHSTOP	Response 1)If stop SSL service successfully: OK +CCHSTOP: 0 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Examples

AT+CCHSTOP

OK

+CCHSTOP: 0

9.2.8 AT+CCHCFG Configure the Context

AT+CCHCFG Configure the Context

Test Command AT+CCHCFG=?	Response +CCHCFG: "sendtimeout",(0-1),(60-150) +CCHCFG: "sslctx",(0-1),(0-1)
Read Command AT+CCHCFG?	Response +CCHCFG: 0,<sendtimeout_val>,<sslctx_index> +CCHCFG: 1,<sendtimeout_val>,<sslctx_index>
Write Command /*Configure the timeout value of the specified client when sending data*/ AT+CCHCFG="sendtimeout",<session_id>,<sendtimeout_val>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the SSL context index, it's as same as AT+CCHSSLCFG*/ AT+CCHCFG="sslctx",<session_id>,<sslctx_index>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<sendtimeout_val>	The timeout value used in sending data stage. The range is 60-150 seconds. The default value is 150.
<sslctx_index>	The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG.

Examples

AT+CCHCFG=?

+CCHCFG: "sendtimeout",(0-1),(60-150)

+CCHCFG: "sslctx",(0-1),(0-1)

OK

AT+CCHCFG?

+CCHCFG: 0,150,0

+CCHCFG: 1,150,0

OK

AT+CCHCFG="sendtimeout",0,120

OK

AT+CCHCFG="sslctx",0,0

OK

9.2.9 AT+CCHOPEN Connect to the special server

AT+CCHOPEN Connect to the special server

Test Command

AT+CCHOPEN=?

Response

+CCHOPEN: (0-1),"ADDRESS",(1-65535)[,(1-2)[,(1-65535)]]

OK

Read Command

AT+CCHOPEN?

Response

If connect to a server, it will show the connected information. Otherwise, the connected information is empty.

+CCHOPEN: 0,<host>,<port>,<client_type>,<bind_port>

+CCHOPEN: 1,<host>,<port>,<client_type>,<bind_port>

OK

Write Command

AT+CCHOPEN=<session_id>,<host>,<port>[,<client_type>[,<bind_port>]]

Response

1)If connect successfully:

OK

+CCHOPEN: <session_id>,0

3)If failed:

OK

+CCHOPEN: <session_id>,<err>

4)If failed:

ERROR

Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<session_id>	The session index to operate. It's from 0 to 1.
<host>	The server address, maximum length is 256 bytes.
<port>	The server port which to be connected, the range is from 1 to 65535.
<client_type>	The type of client, default value is 2: 1 TCP client. 2 SSL/TLS client.
<bind_port>	The local port for channel, the range is from 1 to 65535.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

```
AT+CCHOPEN=?
+CCHOPEN: (0-1),"ADDRESS",(1-65535)[,(1-2)[,(1-65535)]]
```

OK

```
AT+CCHOPEN=0,"183.230.174.137",6043,1
```

OK

```
+CCHOPEN: 0,0
```

```
AT+CCHOPEN?
```

```
+CCHOPEN: 0,"183.230.174.137",6043,1,
```

```
+CCHOPEN: 1,"",,,
```

OK

9.2.10 AT+CCHCLOSE Disconnect from the special server

AT+CCHCLOSE Disconnect from the special server

Test Command	Response
AT+CCHCLOSE=?	OK
Write Command	Response

AT+CCHCLOSE=<session_id>	<p>1)If successfully: OK</p> <p>+CCHCLOSE: <session_id>,0</p> <p>2)If failed: OK</p> <p>+CCHCLOSE: <session_id>,<err></p> <p>3)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session index to operate. It's from 0 to 1.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

AT+CCHCLOSE=0

OK

+CCHCLOSE: 0,0

9.2.11 AT+CCHSEND Send data to the special server

AT+CCHSEND Send data to the special server

Test Command AT+CCHSEND=?	<p>Response +CCHSEND: (0-1),(1-2048)</p> <p>OK</p>
Write Command AT+CCHSEND=<session_id>,<len>	<p>Response</p> <p>1)if parameter is right: > <input data here></p> <p>When the total size of the inputted data reaches <len>, TA will</p>

	report the following code. Otherwise, the serial port will be blocked. OK +CCHSEND: <session_id>,<err> 2)other errors occur: ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<len>	The length of data to send. Its range is from 1 to 2048 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

AT+CCHSEND=?

+CCHSEND: (0-1),(1-2048)

OK

AT+CCHSEND=0,121

> GET / HTTP/1.1

Host: www.baidu.com

User-Agent: MAUI htp User Agent

Proxy-Connection: keep-alive

Content-Length: 0

OK

+CCHSEND: 0,0

9.2.12 AT+CCHRECV Read the cached data that received from the server

AT+CCHRECV Read the cached data that received from the server

Test Command AT+CCHRECV=?	Response +CCHRECV : (0-1),(0-1) OK
Read Command AT+CCHRECV?	Response +CCHRECV: LEN,<cache_len_0>,<cache_len_1> OK
Write Command AT+CCHRECV=<session_id>[,<max_rcv_len>]	Response 1)if parameter is right and there are cached data: OK [+CCHRECV: DATA,<session_id>,<len> ... +CCHRECV: DATA,<session_id>,<len> ...] +CCHRECV: <session_id>,<err> 2)if parameter is not right or any other error occurs: +CCHRECV: <session_id>,<err> ERROR 3)other: ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<max_rcv_len>	Maximum bytes of data to receive in the current AT+CCHRECV calling. The value ranges from 0 to 2048. 0 means it will receive all data from the current cache. The default value is 0 and it will receive all of RX data cached for session <session_id>.
<cache_len_0>	The length of RX data cached for connection 0.
<cache_len_1>	The length of RX data cached for connection 1.
<len>	The length of data followed.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 19.3

Examples

AT+CCHRECV=?

+CCHRECV : (0-1),(0-1)

OK

AT+CCHRECV?

+CCHRECV: LEN,3072,0

OK

AT+CCHRECV=0

OK

+CCHRECV: DATA,0,1024

HTTP/1.1 200 OK

Bdpagetype: 1

Bdqid: 0x9821f6dd000060aa

Cache-Control: private

Connection: keep-alive

Content-Type: text/html;charset=utf-8

Date: Tue, 24 Mar 2020 02:27:10 GMT

Expires: Tue, 24 Mar 2020 02:26:31 GMT

P3p: CP=" OTI DSP COR IVA OUR IND COM "

P3p: CP=" OTI DSP COR IVA OUR IND COM "

Server: BWS/1.1

Set-Cookie:

BAIDUID=F0CD980BA0927350B147AB1064A3423D:FG=1;

expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647;

path=/; domain=.baidu.com

Set-Cookie:

BIDUPSID=F0CD980BA0927350B147AB1064A3423D;

expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647;

path=/; domain=.baidu.com

Set-Cookie: PSTM=1585016830; expires=Thu, 31-Dec-37

23:55:55 GMT; max-age=2147483647; path=/;

domain=.baidu.com

Set-Cookie:

BAIDUID=F0CD980BA0927350739AA64356C3CB13:FG=1;

max-age=31536000; expires=Wed, 24-Mar-21 02:27:10 GMT;

domain=.baidu.com; path=/; version=1; comment=bd

Set-Cookie: BDSVRTM=0; path=/

Set-Cookie: BD_HOME=1; path=/

Set-Cookie: H_PS_PSSID=30972_1467_21116_30823; path=/;

domain=.baidu.com

Traceid

```
+CCHRECV: DATA,0,1024
: 1585016830040414772210962314397044727978
Vary: Accept-Encoding
Vary: Accept-Encoding
X-Ua-Compatible: IE=Edge,chrome=1
Transfer-Encoding: chunked
```

b5e

```
<!DOCTYPE html><!--STATUS OK--><html><head><meta
http-equiv="Content-Type"
content="text/html; charset=utf-8"><meta
http-equiv="X-UA-Compatible"
content="IE=edge,chrome=1"><meta content="always"
name="referrer"><meta name="theme-color"
content="#2932e1"><link rel="shortcut icon"
href="/favicon.ico" type="image/x-icon" /><link rel="search"
type="application/opensearchdescription+xml"
href="/content-search.xml" title="網惧害罅滅儲" /><link
rel="icon" sizes="any" mask
href="//www.baidu.com/img/baidu_85beaf5496f291521eb75ba3
8eacbd87.svg"><link rel="dns-prefetch"
href="//dss0.bdstatic.com"/><link rel="dns-prefetch"
href="//dss1.bdstatic.com"/><link rel="dns-prefetch"
href="//ss1.bdstatic.com"/><link rel="dns-prefetch"
href="//sp0.baidu.com"/><link rel="dns-prefetch"
href="//sp1.baidu.com"/><link rel="dns-prefetch"
href="//sp2.baidu.com"/><title>網惧害涓€涓?
+CCHRECV: DATA,0,1024
```

```
絳浣犳氨鑼ラ厶</title><style type="text/css" id="css_index"
index="index">body,html{height:100%}html{overflow-y:auto}b
ody{font:12px
arial;background:#fff}body,form,li,p,ul{margin:0;padding:0;list-
style:none}#fm,body,form{position:relative}td{text-align:left}im
g{border:0}a{text-decoration:none}a:active{color:#f60}input{bo
rder:0;padding:0}.clearfix:after{content:\20';display:block;heig
ht:0;clear:both}.clearfix{zoom:1}#wrapper{position:relative;min-
height:100%}#head{padding-bottom:100px;text-align:center;*z-
-index:1}#ftCon{height:50px;position:absolute;text-align:left;wi
dth:100%;margin:0
auto;z-index:0;overflow:hidden}#ftConw{display:inline-block;te
xt-align:left;margin-left:33px;line-height:22px;position:relative;
top:-2px;*float:right;*margin-left:0;*position:static}#ftConw,#ft
Conw
a{color:#999}#ftConw{text-align:center;margin-left:0}.bg{backg
round-image:url(http://ss.bdimg.com/static/superman/img/icon
```

```
s-5859e577e2.png);background-repeat:no-repeat;_background-
image:url(http://ss.bdimimg.com/static/superman/img/icon
+CCHRECV: 0,0

+CCHEVENT: 0,RCV EVENT
```

NOTE

If connection is closed by server, the cached data will not be cleaned.

9.3 Command Result Codes

9.3.1 Description of <err>

Result codes	Description
0	Operation succeeded
1	Alerting state(reserved)
2	Unknown error
3	Busy
4	Peer closed
5	Operation timeout
6	Transfer failed
7	Memory error
8	Invalid parameter
9	Network error
10	Open session error
11	State error
12	Create socket error
13	Get DNS error
14	Connect socket error
15	Handshake error
16	Close socket error
17	Nonet
18	Send data timeout

9.3.2 Unsolicited Result Codes

URC	Description
+CCHRECV: DATA,<session_id>,<len> <data>	It will be reported in receiving data. <session_id>: the SSL session id. <len>: the length of receiving data. The range is 1-1024. <data>: the receiving data.
+CCH_RECV_CLOSED: <session_id>,<err>	The connection is closed because any error occurred in receiving data. <session_id>: the SSL session id. <err>: Please refer to the end of this chapter for details.
+CCH_PEER_CLOSED: <session_id>	The connection is closed by the peer. <session_id>: the SSL session id.

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10 AT Commands for MQTT(S)

10.1 Overview

Command	Description
AT+CMQTTSTART	Start MQTT service
AT+CMQTTSTOP	Stop MQTT service
AT+CMQTTACCQ	Acquire a client
AT+CMQTTREL	Release a client
AT+CMQTTSSLCFG	Set the SSL context (only for SSL/TLS MQTT)
AT+CMQTTWILLTOPIC	Input the topic of will message
AT+CMQTTWILLMSG	Input the will message
AT+CMQTTCONNECT	Connect to MQTT server
AT+CMQTTDISC	Disconnect from server
AT+CMQTTTOPIC	Input the topic of publish message
AT+CMQTTPAYLOAD	Input the publish message
AT+CMQTTPUB	Publish a message to server
AT+CMQTTSUB	Subscribe a message to server
AT+CMQTTUNSUB	Unsubscribe a message to server
AT+CMQTTCFG	Configure the MQTT Context

10.2 Detailed Description of Commands

10.2.1 AT+CMQTTSTART Start MQTT service

AT+CMQTTSTART is used to start MQTT service by activating PDP context. You must execute this command before any other MQTT related operations.

AT+CMQTTSTART Start MQTT service

Test Command	Response
AT+CMQTTSTART=?	OK

Execute Command AT+CMQTTSTART	Response
	1)If start MQTT service successfully: OK
	+CMQTTSTART: 0
	2)If failed: OK
	+CMQTTSTART: <err>
	3)If MQTT service have started successfully and you executed AT+CMQTTSTART again: ERROR
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<err>	The result code, please refer to the end of this chapter for details.
-------	---

Examples

AT+CMQTTSTART

OK

+CMQTTSTART: 0

NOTE

AT+CMQTTSTART is used to start MQTT service. You must execute this command before any other MQTT related operations.

If you don't execute AT+CMQTTSTART, the Write/Read Command of any other MQTT will return ERROR immediately.

10.2.2 AT+CMQTTSTOP Stop MQTT service

AT+CMQTTSTOP is used to stop MQTT service.

AT+CMQTTSTOP Stop MQTT service

Test Command	Response
AT+CMQTTSTOP=?	OK
Execute Command	Response
AT+CMQTTSTOP	1)If stop MQTT service successfully: OK
	+CMQTTSTOP: 0
	2)If failed: +CMQTTSTOP: <err>
	ERROR
	3)If MQTT service have stopped successfully and you executed AT+CMQTTSTOP again: ERROR
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<err>	The result code, please refer to the end of this chapter for details.
--------------------	---

Examples

AT+CMQTTSTOP

OK

+CMQTTSTOP: 0

NOTE

AT+CMQTTSTOP is used to stop MQTT service. You can execute this command after AT+CMQTTDISC and AT+CMQTTREL.

10.2.3 AT+CMQTTACCQ Acquire a client

AT+CMQTTACCQ is used to acquire a MQTT client. It must be called before all commands about MQTT connect and after AT+CMQTTSTART.

AT+CMQTTACCQ Acquire a client

Test Command AT+CMQTTACCQ=?	Response +CMQTTACCQ: (0-0),(1-256)[,(0-1)] OK
Read Command AT+CMQTTACCQ?	Response [+CMQTTACCQ: <client_index>,<clientID>,<server_type> [.....]] OK
Write Command AT+CMQTTACCQ=<client_index>,<clientID>[<server_type>]	Response 1)If successfully: OK 2)If failed: +CMQTTACCQ: <client_index>,<err> ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<clientID>	The UTF-encoded string. It specifies a unique identifier for the client. The string length is from 1 to 256 bytes.
<server_type>	A numeric parameter that identifies the server type. The default value is 0. 0 MQTT server with TCP 1 MQTT server with SSL/TLS
<err>	The result code, please refer to the end of this chapter for details.

Examples

```
AT+CMQTTACCQ=0,"a12mmmm",0
OK
```

AT+CMQTTACCQ?

+CMQTTACCQ: 0,"a12mmmm",0

OK

AT+CMQTTACCQ=?

+CMQTTACCQ: (0-0),(1-256)[,(0-1)]

OK

10.2.4 AT+CMQTTREL Release a client

AT+CMQTTREL is used to release a MQTT client. It must be called after AT+CMQTTDISC and before AT+CMQTTSTOP.

AT+CMQTTREL Release a client

Test Command AT+CMQTTREL=?	Response +CMQTTREL: (0-0) OK
Read Command AT+CMQTTREL?	Response 1)If successfully: OK 2)if MQTT not start ERROR
Write Command AT+CMQTTREL=<client_index>	Response 1)If successfully: OK 2)If failed: +CMQTTREL: <client_index>,<err> ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<err>	The result code, please refer to the end of this chapter for details.

Examples

```
AT+CMQTTREL=?
+CMQTTREL: (0-0)
```

```
OK
AT+CMQTTREL=0
OK
AT+CMQTTREL?
OK
```

10.2.5 AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)

AT+CMQTTSSLCFG is used to set the SSL context which to be used in the SSL connection when it will connect to a SSL/TLS MQTT server. It must be called before AT+CMQTTCONNECT and after AT+CMQTTSTART. The setting will be cleared after AT+CMQTTCONNECT failed or AT+CMQTTDISC.

AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)

Test Command AT+CMQTTSSLCFG=?	Response +CMQTTSSLCFG: (0,0),(0-1) OK
Read Command AT+CMQTTSSLCFG?	Response [+CMQTTSSLCFG: <session_id>,<ssl_ctx_index>] [.....] OK
Write Command AT+CMQTTSSLCFG=<session_id>,<ssl_ctx_index>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-

Max Response Time	-
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 0.
<ssl_ctx_index>	The SSL context ID which will be used in the SSL connection. It's from 0 to 1.

Examples

```

AT+CMQTTSSLCFG?
+CMQTTSSLCFG: 0,0

OK
AT+CMQTTSSLCFG=?
+CMQTTSSLCFG: (0,0),(0-1)

OK
AT+CMQTTSSLCFG=0,1

OK

```

10.2.6 AT+CMQTTWILLTOPIC Input the topic of will message

AT+CMQTTWILLTOPIC is used to input the topic of will message.

AT+CMQTTWILLTOPIC Input the topic of will message

Test Command AT+CMQTTWILLTOPIC=?	Response +CMQTTWILLTOPIC: (0-0),(1-1024) OK
Write Command AT+CMQTTWILLTOPIC=<client_index>,<req_length>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTWILLTOPIC: <client_index>,<err>

	ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<req_length>	The length of input topic. The will topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code, please refer to the end of this chapter for details.

Examples

```
AT+CMQTTWILLTOPIC=0,10
```

```
>
```

```
OK
```

10.2.7 AT+CMQTTWILLMSG Input the will message

AT+CMQTTWILLMSG is used to input the message body of will message.

AT+CMQTTWILLMSG Input the will message

Test Command AT+CMQTTWILLMSG=?	Response +CMQTTWILLMSG: (0-0),(1-1024),(0-2)
	OK
Write Command AT+CMQTTWILLMSG=<client_index>,<req_length>,<qos>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTWILLMSG: <client_index>,<err>
	ERROR

	3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<req_length>	The length of input data. The will message should be UTF-encoded string. The range is from 1 to 1024 bytes.
<qos>	The qos value of the will message. The range is from 0 to 2.

Examples

```
AT+CMQTTWILLMSG=0,6,1
```

```
>  
OK
```

10.2.8 AT+CMQTTCONNECT Connect to MQTT server

AT+CMQTTCONNECT is used to connect to a MQTT server.

AT+CMQTTCONNECT Connect to MQTT server

Test Command AT+CMQTTCONNECT=?	Response +CMQTTCONNECT: (0-0),(9-128),(1-64800),(0-1)[,<user_name>,<pass_word>] OK
Read Command AT+CMQTTCONNECT?	Response +CMQTTCONNECT: [<client_index>,[,<server_addr>,<keepalive_time>,<clean_session>] >[,<user_name>[,<pass_word>]]] [.....]] OK
Write Command AT+CMQTTCONNECT=<client_index>,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>,<pass_word>]	Response 1)If successfully: OK

```
palive_time>,<clean_session
>,<user_name>,<pass_word
>]]
```

+CMQTTCONNECT: <client_index>,0

2)If failed:

OK

+CMQTTCONNECT: <client_index>,<err>

3)If failed:

ERROR

+CMQTTCONNECT: <client_index>,<err>

3)If failed:

ERROR

+CMQTTCONNECT: <client_index>,<err>

4) If failed:

+CMQTTCONNECT: <client_index>,<err>

ERROR

5)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<client_index>

A numeric parameter that identifies a client. The range of permitted values is 0 to 0.

<server_addr>

The string that described the server address and port. The range of the string length is 9 to 128 bytes. The string should be like this "tcp://116.247.119.165:5141", must begin with "tcp://". If the <server_addr> not include the port, the default port is 1883.

<keepalive_time>

The time interval between two messages received from a client. The client will send a keep-alive packet when there is no message sent to server after song long time. The range is from 1s to 64800s (18 hours).

<clean_session>

The clean session flag. The value range is from 0 to 1, and default value is 0.

0 the server must store the subscriptions of the client after it disconnected. This includes continuing to store QoS 1 and QoS 2 messages for the subscribed topics so that they can be delivered when the client reconnects. The server must also maintain the state of in-flight messages being delivered at the point the connection is lost. This information must be kept until

	<p>the client reconnects.</p> <p>1 the server must discard any previously maintained information about the client and treat the connection as "clean". The server must also discard any state when the client disconnects.</p>
<user_name>	The user name identifies the name of the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes.
<pass_word>	The password corresponding to the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

```
AT+CMQTTCONNECT=0,"tcp://120.27.2.154:1883",20,1
```

```
OK
```

```
+CMQTTCONNECT: 0,0
```

```
AT+CMQTTCONNECT?
```

```
+CMQTTCONNECT: 0,"tcp://120.27.2.154:1883",20,1
```

```
OK
```

NOTE

AT+CMQTTCONNECT is used to connect to a MQTT server.

If you don't set the SSL context by AT+CMQTTSSLCFG before connecting a SSL/TLS MQTT server by AT+CMQTTCONNECT, it will use the <client_index> (the 1st parameter of AT+CMQTTCONNECT) SSL context when connecting to the server.

10.2.9 AT+CMQTTDISC Disconnect from server

AT+CMQTTDISC is used to disconnect from the server.

AT+CMQTTDISC Disconnect from server

Test Command

```
AT+CMQTTDISC=?
```

Response:

```
+CMQTTDISC: (0-0),(0, 60-180)
```

<p>Read Command AT+CMQTTDISC?</p>	<p>OK</p> <p>Response: [+CMQTTDISC: 0,<disc_state> [.....]]</p>
<p>Write Command AT+CMQTTDISC=<client_in dex>,<timeout></p>	<p>OK</p> <p>Response</p> <p>1)If disconnect successfully: +CMQTTDISC: <client_index>,0</p> <p>OK</p> <p>2)If disconnect successfully: OK</p> <p>+CMQTTDISC: <client_index>,0</p> <p>3)If failed: OK</p> <p>+CMQTTDISC: <client_index>,<err></p> <p>4)If failed: ERROR</p> <p>5)If failed: +CMQTTDISC: <client_index>,<err></p> <p>ERROR</p>
<p>Parameter Saving Mode</p>	<p>-</p>
<p>Max Response Time</p>	<p>-</p>
<p>Reference</p>	<p></p>

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<timeout>	The timeout value for disconnection. The unit is second. The range is 60s to 180s. The default value is 0s (not set the timeout value).
<disc_state>	1 disconnection 0 connection
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

AT+CMQTTDISC=0,120

OK

+CMQTTDISC: 0,0

10.2.10 AT+CMQTTTOPIC Input the topic of publish message

AT+CMQTTTOPIC is used to input the topic of a publish message.

AT+CMQTTTOPIC Input the topic of publish message

Test Command AT+CMQTTTOPIC=?	Response +CMQTTTOPIC: (0-0),(1-1024)
	OK
Write Command AT+CMQTTTOPIC=<client_index>,<req_length>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTTOPIC: <client_index>,<err>
	ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<req_length>	The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

AT+CMQTTTOPIC=0,9

>

OK

10.2.11 AT+CMQTTPAYLOAD Input the publish message

AT+CMQTTPAYLOAD is used to input the message body of a publish message.

AT+CMQTTPAYLOAD Input the publish message

Test Command AT+CMQTTPAYLOAD=?	Response +CMQTTPAYLOAD: (0-0),(1-1024) OK
Write Command AT+CMQTTPAYLOAD=<client_index>,<req_length>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTPAYLOAD: <client_index>,<err> ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<req_length>	The length of input message data. The publish message should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

AT+CMQTTPAYLOAD=0,6

>

OK

10.2.12 AT+CMQTTPUB Publish a message to server

AT+CMQTTPUB is used to publish a message to MQTT server.

AT+CMQTTPUB Publish a message to server

Test Command AT+CMQTTPUB=?	Response +CMQTTPUB: (0-0),(0-2),(60-180),(0-1),(0-1)
	OK
Write Command AT+CMQTTPUB=<client_index>,<qos>,<pub_timeout>[,<retained>[,<dup>]]	Response 1)If successfully: OK +CMQTTPUB: <client_index>,0 2)If failed: OK +CMQTTPUB: <client_index>,<err> 3)If failed: +CMQTTPUB: <client_index>,<err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<qos>	The publish message's qos. The range is from 0 to 2. 0 at most once 1 at least once 2 exactly once
<pub_timeout>	The publishing timeout interval value. Since the client publish a

	message to server, it will report failed if the client receive no response from server after the timeout value seconds. The range is from 60s to 180s.
<retained>	The retain flag of the publish message. The value is 0 or 1. The default value is 0. When a client sends a PUBLISH to a server, if the retain flag is set to 1, the server should hold on to the message after it has been delivered to the current subscribers.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

```
AT+CMQTTPUB=0,1,60
```

```
OK
```

```
+CMQTTPUB: 0,0
```

10.2.13 AT+CMQTTSUB Subscribe a message to server

AT+CMQTTSUB is used to subscribe a message to MQTT server.

AT+CMQTTSUB Subscribe a message to server

Test Command AT+CMQTTSUB=?	Response +CMQTTSUB: (0-0),(1-1024),(0-2),(0-1) OK
Read Command AT+CMQTTSUB?	Response +CMQTTSUB: [<topic>] OK
Write Command /* subscribe one topic*/ AT+CMQTTSUB=<client_index>,<reqLength>,<qos>[,<dup>]	Response 1)If successfully: > <input data here> OK +CMQTTSUB: <client_index>,0

	<p>2)If failed: OK</p> <p>+CMQTTSUB: <client_index>,<err></p> <p>3)If failed: +CMQTTSUB: <client_index>,<err></p> <p>ERROR</p> <p>4)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
<req_length>	The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<qos>	The publish message's qos. The range is from 0 to 2. 0 at most once 1 at least once 2 exactly once
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.
<topic>	Topics to which you have subscribed

Examples

```
AT+CMQTTSUB=0,9,1
```

```
>
```

```
OK
```

```
+CMQTTSUB: 0,0
```

```
AT+CMQTTSUB=0,1
```

```
OK
```

```
+CMQTTSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

10.2.14 AT+CMQTTUNSUB Unsubscribe a message to server

AT+CMQTTUNSUB is used to unsubscribe a message to MQTT server.

AT+CMQTTUNSUB Unsubscribe a message to server

Test Command AT+CMQTTUNSUB=?	Response +CMQTTUNSUB: (0-0),(1-1024),(0-1)
Write Command /* unsubscribe one topic*/ AT+CMQTTUNSUB=<client_index>,<reqLength>,<dup>	<p>OK</p> <p>Response</p> <p>1)If successfully:</p> <p>></p> <p><input data here></p> <p>OK</p> <p>+CMQTTUNSUB: <client_index>,0</p> <p>2)If failed:</p> <p>OK</p> <p>+CMQTTUNSUB: <client_index>,<err></p> <p>3)If failed:</p> <p>+CMQTTUNSUB: <client_index>,<err></p> <p>ERROR</p> <p>4)If failed:</p> <p>ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
----------------	--

<req_length>	The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter for details.

Examples

```
AT+CMQTTUNSUBTOPIC=0,9
```

```
>
```

```
OK
```

```
AT+CMQTTUNSUB=0,1
```

```
OK
```

```
+CMQTTUNSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

10.2.15 AT+CMQTTCFG Configure the MQTT Context

AT+CMQTTCFG is used to configure the MQTT context. It must be called before AT+CMQTTCONNECT. The setting will be cleared after AT+CMQTTREL.

AT+CMQTTCFG Configure the MQTT Context

Test Command AT+CMQTTCFG=?	Response +CMQTTCFG: "checkUTF8",(0-0),(0-1) +CMQTTCFG: "optimeout",(0-0),(20-120) +CMQTTCFG: "version",(0-0),(3-4)
Read Command AT+CMQTTCFG?	OK Response [+CMQTTCFG: 0,<checkUTF8_flag>,<optimeout_val> [.....]]

Write Command /*Configure the check UTF8 flag of the specified MQTT client context*/ AT+CMQTTCFG="checkUTF8",<index>,<checkUTF8_flag> >	OK Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the max timeout interval of the send or receive data operation */ AT+CMQTTCFG="optimeout",<index>,<optimeout_val>	OK Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<checkUTF8_flag>	Reserve.
<optimeout_val>	The max timeout interval of sending or receiving data operation. The range is from 20 seconds to 120 seconds, the default value is 120 seconds.
+CMQTTCFG: "version",(0-0),(3-4)	(0-0): A numeric parameter that identifies a client. The range of permitted values is 0 to 0. (3-4): Version of MQTT. <u>3</u> : MQTT 3.1. The default value is 3. <u>4</u> : MQTT 3.1.1.

Examples

```
AT+CMQTTCFG?
+CMQTTCFG: 0,1,120
```

```
OK
AT+CMQTTCFG="optimeout",0,24
OK
AT+CMQTTCFG="checkUTF8",0,0
OK
AT+CMQTTCFG?
```

+CMQTTCFG: 0,0,24

OK

NOTE

The setting will be cleared after AT+CMQTTREL.

10.3 Command Result Codes

10.3.1 Description of <err>

<err>	Description
0	operation succeeded
1	failed
2	bad UTF-8 string
3	sock connect fail
4	sock create fail
5	sock close fail
6	message receive fail
7	network open fail
8	network close fail
9	network not opened
10	client index error
11	no connection
12	invalid parameter
13	not supported operation
14	client is busy
15	require connection fail
16	sock sending fail
17	timeout
18	topic is empty
19	client is used
20	client not acquired
21	client not released

22	length out of range
23	network is opened
24	packet fail
25	DNS error
26	socket is closed by server
27	connection refused: unaccepted protocol version
28	connection refused: identifier rejected
29	connection refused: server unavailable
30	connection refused: bad user name or password
31	connection refused: not authorized
32	handshake fail
33	not set certificate
34	Open session failed
35	Disconnect from server failed

10.3.2 Unsolicited Result Codes

URC	Description
+CMQTTCONNLOST: <client_index>,<cause>	When client disconnect passively, URC "+CMQTTCONNLOST" will be reported, then user need to connect MQTT server again.
+CMQTTNONET	When the network is become no network, the module will report this URC. If received this message, you should restart the MQTT service by AT+CMQTTSTART.
+CMQTTTRXSTART: <client_index>,<topic_total_len>,<payload_total_len> +CMQTTTRXTOPIC: <client_index>,<sub_topic_len> <sub_topic> /*for long topic, split to multiple packets to report*/ [<CR><LF>+CMQTTTRXTOPIC: <client_index>,<sub_topic_len> <sub_topic>] +CMQTTTRXPAYLOAD: <client_index>,<sub_payload_len> <sub_payload> /*for long payload, split to multiple packets to report*/ [+CMQTTTRXPAYLOAD: <client_index>,<sub_payload_len> <sub_payload>]	If a client subscribes to one or more topics, any message published to those topics are sent by the server to the client. The following URC is used for transmitting the message published from server to client. 1)+CMQTTTRXSTART: <client_index>,<topic_total_len>,<payload_total_len>\r\n At the beginning of receiving published message, the module will report this to user, and indicate client index with <client_index>, the

+CMQTTRXEND: <client_index>

topic total length with <topic_total_len> and the payload total length with <payload_total_len> after "\r\n".

2)+CMQTTRXTOPIC:
<client_index>,<sub_topic_len>\r\n<sub_topic>

After the command "+CMQTTRXSTART" received, the module will report the second message to user, and indicate client index with <client_index>, the topic packet length with <sub_topic_len> and the topic content with <sub_topic> after "\r\n".

For long topic, it will be split to multiple packets to report and the command "+CMQTTRXTOPIC" will be send more than once with the rest of topic content. The sum of <sub_topic_len> is equal to <topic_total_len>.

3)+CMQTTRXPAYLOAD:
<client_index>,<sub_payload_len>\r\n<sub_payload>

After the command "+CMQTTRXTOPIC" received, the module will send third message to user, and indicate client index with <client_index>, the payload packet length with <sub_payload_len> and the payload content with <sub_payload> after "\r\n".

For long payload, the same as "+CMQTTRXTOPIC".

4)+CMQTTRXEND: <client_index>

At last, the module will send fourth message to user and indicate the topic and payload have been transmitted completely.

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 0.
----------------	--

<cause>	The cause of disconnection. 1 Socket is closed passively. 2 Socket is reset. 3 Network is closed.
<topic_total_len>	The length of message topic received from MQTT server. The range is from 1 to 1024 bytes.
<payload_total_len>	The length of message body received from MQTT server. The range is from 1 to 1024 bytes.
<sub_topic_len>	The sub topic packet length, The sum of <sub_topic_len> is equal to <topic_total_len>.
<sub_topic>	The sub topic content.
<sub_payload_len>	The sub message body packet length, The sum of <sub_payload_len> is equal to <payload_total_len>.
<sub_payload>	The sub message body content.

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11 AT Commands for HTTP(S)

11.1 Overview

Command	Description
AT+HTTPIPINIT	Start HTTP service
AT+HTTPTERM	Stop HTTP Service
AT+HTTPPARA	Set HTTP Parameters value
AT+HTTPACTION	HTTP Method Action
AT+HTTPHEAD	Read the HTTP Header Information of Server Response
AT+HTTPREAD	Read the response information of HTTP Server
AT+HTTPDATA	Input HTTP Data

11.2 Detailed Description of AT Commands for HTTP(S)

11.2.1 AT+HTTPIPINIT Start HTTP Service

AT+HTTPIPINIT is used to start HTTP service by activating PDP context. You must execute AT+HTTPIPINIT before any other HTTP related operations.

AT+HTTPIPINIT Start HTTP Service	
Test Command AT+HTTPIPINIT=?	Response OK
Execute Command AT+HTTPIPINIT	Response 1)If start HTTP service successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-

Max Response Time	120000ms
Reference	-

Examples

AT+HTTPIPINIT
OK

11.2.2 AT+HTTPTERM Stop HTTP Service

AT+HTTPTERM is used to stop HTTP service.

AT+HTTPTERM Stop HTTP Service

Test Command	Response
AT+HTTPTERM=?	OK
Execute Command	Response
AT+HTTPTERM	1)If stop HTTP service successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Examples

AT+HTTPTERM
OK

11.2.3 AT+HTTTPARA Set HTTP Parameters value

AT+HTTTPARA is used to set HTTP parameters value. When you want to access to a HTTP server, you should input <value> like http://'server':'tcpPort'/'path'. In addition, https://'server':'tcpPort'/'path' is used to access to a HTTPS server.

AT+HTTTPARA Set HTTP Parameters value

Test Command	Response
AT+HTTTPARA=?	OK
Write Command AT+HTTTPARA="URL",<url>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="CONNECTTO",<conn_timeout>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="RECVTO",<recv_timeout>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="CONTENT",<content_type>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="ACCEPT",<accept-type>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="SSLCFG",<sslcfg_id>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="USERDATA",<user_data>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="READMODE",<readmode>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur:

	ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<url>	URL of network resource.String,start with "http://" or"https://" a)http://'server':'tcpPort'/'path'. b)https://'server':'tcpPort'/'path' "server" DNS domain name or IP address "path" path to a file or directory of a server "tcpPort" http default value is 80,https default value is 443.(can be omitted)
<conn_timeout>	Timeout for accessing server, Numeric type, range is 20-120s, default is 120s.
<recv_timeout>	Timeout for receiving data from server, Numeric type range is 2s-120s, default is 20s.
<content_type>	This is for HTTP "Content-Type" tag, String type, max length is 256, and default is "text/plain".
<accept-type>	This is for HTTP "Accept-type" tag, String type, max length is 256, and default is "*/*".
<sslcfg_id>	This is setting SSL context id, Numeric type, range is 0-1. Default is 0.
<user_data>	The customized HTTP header information. String type, max length is 256.
<readmode>	For HTTPREAD, Numeric type, it can be set to 0 or 1. If set to 1, you can read the response content data from the same position repeatedly. The limit is that the size of HTTP server response content should be shorter than 1M.Default is 0.

Examples

```
AT+HTTPPARA="URL","http://www.baidu.com"
OK
```

11.2.4 AT+HTTPACTION HTTP Method Action

AT+HTTPACTION is used to perform a HTTP Method. You can use HTTPACTION to send a get/post request to a HTTP/HTTPS server.

AT+HTTPACTION HTTP Method Action

Test Command AT+HTTPACTION=?	Response +HTTPACTION: (0-4) OK
Write Command AT+HTTPACTION=<method>	Response 1)If parameter format is right: OK +HTTPACTION: <method>,<statuscode>,<datalen> 2)If parameter format is right but server connected unsuccessfully: OK +HTTPACTION: <method>,<errcode>,<datalen> 3)If parameter format is not right or other errors occur: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<method>	HTTP method specification: 0 GET 1 POST 2 HEAD 3 DELETE 4 PUT
<statuscode>	Please refer to the end of this chapter
<datalen>	The length of data received

Examples

```
AT+HTTPACTION=?
+HTTPACTION: (0-4)
```

```
OK
```

```
AT+HTTPACTION=0
```

```
OK
```

```
+HTTPACTION: 0,200,104220
```

11.2.5 AT+HTTPHEAD Read the HTTP Header Information of Server Response

AT+HTTPHEAD is used to read the HTTP header information of server response when module receives the response data from server.

AT+HTTPHEAD Read the HTTP Header Information of Server Response

Test Command AT+HTTPHEAD=?	Response OK
Execute Command AT+HTTPHEAD	Response 1)If read the header information successfully: +HTTPHEAD: <data_len> <data> OK 2)If read failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<dat_len>	The length of HTTP header
<data>	The header information of HTTP response

Examples

```
AT+HTTPHEAD
+HTTPHEAD: 653
HTTP/1.1 200 OK
Content-Type: text/html
Connection: keep-alive
X-Cache: MISS from PDcache-04:opinion.people.com.cn
Date: Tue, 24 Mar 2020 03:12:09 GMT
Powered-By-ChinaCache: HIT from CNC-WB-b-D24
Powered-By-ChinaCache: HIT from CNC-WV-b-D1C
Etag: W/"5b7379f5-57e9"
x-cc-via: CNC-WB-b-D24[H,1], CNC-WV-b-D1C[H,62]
d-cc-upstream: CNC-WV-b-D1C
CACHE: TCP_HIT
Vary: Accept-Encoding
Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT
```

```
Expires: Tue, 24 Mar 2020 03:17:09 GMT
x-cc-req-id: f4b9e1793697d1ef2950f530aeec4519
Content-Length: 22505
Age: 0
Accept-Ranges: bytes
Server: nginx
X-Frame-Options: ALLOW-FROM .*
CC_CACHE: TCP_REFRESH_HIT
OK
```

11.2.6 AT+HTTPREAD Read the response information of HTTP Server

After sending HTTP(S)GET/POST requests, you can retrieve HTTP(S)response information from HTTP(S)server via UART/USB port by AT+HTTPREAD. When the <datalen> of "+HTTPACTION: <method>, <statuscode>, <datalen>" is not equal to 0, You can execute AT+HTTPREAD=<start_offset>,<byte_size> to read out data to port. If parameter <byte_size> is set greater than the size of data saved in buffer, all data in cache will output to port.

AT+HTTPREAD Read the response information of HTTP Server

Test Command AT+HTTPREAD=?	Response OK
Read Command AT+HTTPREAD?	Response 1)If check successfully: +HTTPREAD: LEN,<len> OK 2)If failed (no more data other error): ERROR
Write Command AT+HTTPREAD=[<start_offset>,<byte_size>	Response 1)If read the response info successfully: OK +HTTPREAD: <data_len> <data> +HTTPREAD: 0 If <byte_size> is bigger than the data size received, module will only return actual data size. 2)If read failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms

Reference -

Defined Values

<start_offset>	The start position of reading
<byte_size>	The length of data to read
<datalen>	The actual length of read data
<data>	Response content from HTTP server
<len>	Total size of data saved in buffer.

Examples

AT+HTTPREAD?

```
+HTTPREAD: LEN,22505
```

```
OK
```

AT+HTTPREAD=0,500

```
OK
```

```
+HTTPREAD: 500
```

```
\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
```

```
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml">
```

```
<head>
```

```
<meta http-equiv="content-type" content="text/html;charset=GB2312"/>
```

```
<meta http-equiv="Content-Language" content="utf-8" />
```

```
<meta content="all" name="robots" />
```

```
<title>人民日报钟声:牢记历史是为了更好开创未来--观点--人民网 </title>
```

```
<meta name="keywords" content="" />
```

```
<meta name="description" content=" 日方应在正确对待历史?"
```

```
+HTTPREAD: 0
```

NOTE

The response content received from server will be saved in cache, and would not be cleaned up by AT+HTTPREAD.

Due to the max size of protocol stack is 10K bytes, when the total size of the data from server is bigger than that and 'READMODE' is 0, you should read the data quickly, or you will fail to read it.

11.2.7 AT+HTTPDATA Input HTTP Data

You can use AT+HTTPDATA to input data to post when you send a HTTP/HTTPS POST request.

AT+HTTPDATA Input HTTP Data

Test Command AT+HTTPDATA=?	Response OK
Write Command AT+HTTPDATA=<size>,<time>	Response 1)if parameter format is right: DOWNLOAD <input data here> When the total size of the inputted data reaches <size>, TA will report the following code. Otherwise, the serial port will be blocked. OK 2)If parameter format is wrong or other errors occur: ERROR
Parameter Saving Mode	
Max Response Time	
Reference	

Defined Values

<size>	Size in bytes of the data to post. range is 1- 10240 (bytes)
<time>	Maximum time in seconds to input data.range is 10-65535

Examples

```
AT+HTTPDATA=18,1000
DOWNLOAD
Message=helloworld
OK
```

11.3 Command Result Codes

11.3.1 Description of <statuscode>

<statuscode>	Description
100	Continue
101	Switching Protocols
200	OK
201	Created
202	Accepted
203	Non-Authoritative Information
204	No Content
205	Reset Content
206	Partial Content
300	Multiple Choices
301	Moved Permanently
302	Found
303	See Other
304	Not Modified
305	Use Proxy
307	Temporary Redirect
400	Bad Request
401	Unauthorized
402	Payment Required
403	Forbidden
404	Not Found
405	Method Not Allowed
406	Not Acceptable
407	Proxy Authentication Required
408	Request Timeout
409	Conflict
410	Gone
411	Length Required
412	Precondition Failed
413	Request Entity Too Large
414	Request-URI Too Large
415	Unsupported Media Type
416	Requested range not satisfiable
417	Expectation Failed
500	Internal Server Error
501	Not Implemented
502	Bad Gateway

503	Service Unavailable
504	Gateway timeout
505	HTTP Version not supported
600	Not HTTP PDU
601	Network Error
602	No memory
603	DNS Error
604	Stack Busy

11.3.2 Description of <errcode>

<errcode>	Meaning
0	Success
701	Alert state
702	Unknown error
703	Busy
704	Connection closed error
705	Timeout
706	Receive/send socket data failed
707	File not exists or other memory error
708	Invalid parameter
709	Network error
710	start a new ssl session failed
711	Wrong state
712	Failed to create socket
713	Get DNS failed
714	Connect socket failed
715	Handshake failed
716	Close socket failed
717	No network error
718	Send data timeout
719	CA missed

11.4 Unsolicited Result Codes

URC	Description
+HTTP_PEER_CLOSED	It's a notification message. While received, it means the connection has been closed by server.
+HTTP_NONET_EVENT	It's a notification message. While received, it means now the network is unavailable.

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12 AT Commands for FOTA

12.1 Overview

Command	Description
AT+CFOTA	Start FOTA Service
AT+LFOTA	Start Local FOTA Service

12.2 Detailed Description of AT Command for FOTA

12.2.1 AT+CFOTA Start FOTA service

AT+CFOTA Start FOTA Service	
Write Command AT+CFOTA=<channel>,<mode>,<destination_ip/url>[,<username>[,<password>]]	Response 1) OK +CFOTA: <err> 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	-

Defined Values

<channel>	0-5 means the channel number
<mode>	0 FTP way 1 HTTP way
<destination_ip:port/url>	The remote site server's IP address or URL address. IP address should be in the format of the dotted decimal notation:

	<p>XXX.XXX.XXX.XXX.</p> <p>URL address should be ASCII characters, the maximum of the length is 255 bytes.</p> <p>NOTE: If <port> are omitted, the default FTP port is 21 and the default HTTP port is 80.</p>
<username>	The login user name, it should be ASCII characters, and the maximum of the length is 128 bytes.
<password>	The login password, it should be ASCII characters, and the maximum of the length is 128 bytes.

Examples

```
AT+CFOTA=0,0,"183.230.174.137:6047/fbf_dfota.bin",simcom,simcom
```

OK

```
+CFOTA: 100
```

12.2.2 AT+LFOTA Start Local Fota Service

AT+LFOTA Start Local Fota Service

Test Command AT+LFOTA=?	<p>Response</p> <p>+LFOTA: (0-1),<File Size>,(0-1)</p> <p>OK</p>
Write Command AT+LFOTA=<ops>,<File Size>,<erase>	<p>Response</p> <p>1)If successfully:</p> <p>></p> <p>OK</p> <p>2)If failed:</p> <p>></p> <p>ERROR</p> <p>3)If failed:</p> <p>ERROR</p>
Parameter Saving Mode	-
Max Response Time	300000ms
Reference	-

Defined Values

<ops>	0 initial parameters 1 start transfer
<File Size>	The bytes of the file data to send.
<erase>	1 First packet 0 Not the first packet

Examples

Whole packet:

```
AT+LFOTA=0,5358979,1
OK
AT+LFOTA=1,5358979,1
>
OK
```

Multiple packet:

```
AT+LFOTA=0,535902,1
OK
AT+LFOTA=1,178634,1
>
OK
AT+LFOTA=1,178634,0
>
OK
AT+LFOTA=1,178634,0
>
OK
```

NOTE

If UART is used for LFOTA, please make sure that the delay time between each 256 byte reach to at least 50ms.

If sending file crash, restart module and increase the delay time between each 256 byte reach to 50ms, and then try to send file again

//After the module restart, the system will enter upgrade process and print the status of FOTA upgrade as follows URC.

AdupsProcedure 4.0

abup check_delta,Header:0x20, 0x3, 0x17, 0x20

abup check_delta, delta md5 check sucess. //check the firmware package success

adups_IsPartPackge: NO!
adups_IsPackgeFound ret=1

adups_bl_notify_status:200,0
check old bin

check old bin end, is old bin.

patch forward ...

+FOTA: patch ratio: 1

+FOTA: patch ratio: 3

+FOTA: patch ratio: 4

+FOTA: patch ratio: 6

+FOTA: patch ratio: 7

+FOTA: patch ratio: 9

.....
+FOTA: patch ratio: 92

+FOTA: patch ratio: 93

+FOTA: patch ratio: 95

adups_bl_notify_status:201,100

Update done, reboot now ... //update the system success

bootloader try normal boot system start!

LoadVerifyImageHead read(len=272), Time(ms)->0.

test:VerifyImageHead skip

VerifyImageBody sha256 skip

//After the upgrade is completed, the module will restart automatically.

12.3 Unsolicited Result Codes

URC	Description
+CFOTA: 100	FOTA COMPLETE, it will restart in 8s.
+CFOTA: 1001	FOTA URL is invalid, maybe PDP was active.
+CFOTA: 1002	FOTA timeout
+CFOTA: 1003	FOTA URL is unknown
+CFOTA: 1004	FOTA username or password is error
+CFOTA: 1005	FOTA file is not exist
+CFOTA: 1006	The size of FOTA file is invalid
+CFOTA: 1007	Get file failed
+CFOTA: 1008	Check file error
+CFOTA: 1009	FOTA internal error
+CFOTA: 1010	Fota file too large
+CFOTA: 1011	Fota set flag error
+CFOTA: 1012	Fota parameter size error

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13 AT Commands for COAP

13.1 Overview

Command	Description
AT+COAPSTART	Active PDP
AT+COAPSTOP	Deactive PDP
AT+COAPOPEN	Open a COAP server
AT+COAPCLOSE	Close a COAP server
AT+COAPHEAD	Config the head of COAP
AT+COAPOPTION	Config the option of COAP
AT+COAPSEND	Send COAP message to the server
AT+COAPSENDTX	Send COAP message to the server by transparent transmission

13.2 Detailed Description of AT Commands for COAP

13.2.1 AT+COAPSTART Active PDP

AT+COAPSTART is used to active PDP context. You must execute AT+COAPSTART before any other COAP related operations.

AT+COAPSTART Active PDP	
Test Command AT+COAPSTART=?	Response OK
Execution Command AT+COAPSTART	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms

Reference

Examples

AT+COAPSTART

OK

13.2.2 AT+COAPSTOP Deactive PDP

AT+COAPSTOP is used to deactive PDP context When you are no longer using the COAP service, use this command.

AT+COAPSTOP Deactive PDP

Test Command	Response
AT+COAPSTOP=?	OK
Execution Command	Response
AT+COAPSTOP	1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Examples

AT+COAPSTOP

OK

13.2.3 AT+COAPOPEN Open a COAP server

AT+COAPOPEN is used to open a COAP sever, make sure you open a COAP sever before you execute AT+COAPCLOSE command.

AT+COAPOPEN Open a COAP server

Test Command	Response
AT+COAPOPEN=?	OK

Execute Command AT+COAPOPEN=<server>,<serverport>	Response 1) If the registration request is successfully sent, but no successful registration response is received OK 2) If the registration request is successfully sent, and successful registration response is received OK +COAPOPEN:<coap_id> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<server>	The COAP server address URL or ipaddress
<serverport>	The COAP server port,the range is from 0 to 65535.
<coap_id>	The COAP session ID.the range is from 0 to 1.

Examples

```
AT+COAPOPEN=?
OK
AT+COAPOPEN="47.108.134.22",5683
OK
+COAPOPEN:0
```

13.2.4 AT+COAPCLOSE Close a COAP server

This command is used to Deregister to a COAP server.

AT+COAPCLOSE Close a COAP server

Test Command AT+COAPCLOSE=?	Response OK
Write Command AT+COAPCLOSE=<coap_id>	Response 1)

	OK
	2)
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<coap_id>	AT+COAPOPEN return the COAP session ID.the range is from 0 to 1.
-----------	--

Examples

AT+COAPCLOSE=0

OK

13.2.5 AT+COAPHEAD Config the head of COAP

AT+COAPHEAD is used to config the head of COAP

AT+COAPHEAD Config the head of COAP

Test Command	Response
AT+COAPHEAD=?	OK
Write Command	Response
AT+COAPHEAD=<coap_id>,<msgId>,<tkl>,<token>]	1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<coap_id>	AT+COAPOPEN return the COAP session ID.the range is from 0 to 1.
<msgId>	The COAP message ID,the range is 0 to 65535.
<tkl>	The length of token,the range is 1 to 8.

<token>	The token of COAP message.
---------	----------------------------

Examples

```
AT+COAPHEAD=?
OK
AT+COAPHEAD=0,35691,1,"1"
OK
```

13.2.6 AT+COAPOPTION Config the option of COAP

AT+COAPOPTION is used to config the option of COAP.

AT+COAPOPTION Config the option of COAP

Test Command	Response
AT+COAPOPTION=?	OK
Write Command	Response
AT+COAPOPTION=<coap_id>,<opt_count>,<optNum>,<optValue>[,<optNum>,<optValue>.....]	1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<coap_id>	AT+COAPOPEN return the COAP session ID.the range is from 0 to 1.
<opt_count>	The num of option you want to config.the range is 0 to 10.
<optNum>	The type of option. the range is from 0 to 65535.
<optValue>	The value of the option. max length is 256.

Examples

```
AT+COAPOPTION=?
OK
AT+COAPOPTION=0,1,7,"5683"
OK
```

13.2.7 AT+COAPSEND Send COAP message to the server

You can use this command to Send COAP message to the server

AT+COAPSEND Send COAP message to the server

Test Command AT+COAPSEND=?	Response OK
Write Command AT+COAPSEND=<coap_id>,<type>,<method>[,<data_len>,<data>]	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<coap_id>	AT+COAPOPEN return the COAP session ID.the range is from 0 to 1.
<type>	The message type of COAP,it can set "con","non","ack","rst".
<method>	The message method of COAP,it can set "get","post","put","delete","fetch","patch","ipatch".
<data_len>	The data length of COAP message.the range is 1 to 255.
<data>	The data of COAP message

Examples

```
AT+COAPSEND=?
OK
AT+COAPSEND=0,"con","get",5,"12345"
OK
```

13.2.8 AT+COAPSENDTX Send COAP message to the server by transparent transmission

This command is used to Send COAP message to the server by transparent transmission.

AT+COAPSENDTX Send COAP message to the server by transparent transmission

Test Command AT+COAPSENDTX=?	Response OK
Write Command AT+COAPSENDTX=<coap_id>,<type>,<method>,<data_len>	Response 1) > OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<coap_id>	AT+COAPOPEN return the COAP session ID.the range is from 0 to 1.
<type>	The message type of COAP,it can set "con","non","ack","rst".
<method>	The message method of COAP,it can set "get","post","put","delete","fetch","patch","ipatch".
<data_len>	The data length of COAP message.the range is 1 to 2000.

Examples

```
AT+COAPSENDTX=?
OK
AT+COAPSENDTX =0,"con","get",5
>
01234
OK
```

13.2.9 +COAPRECV Receive response message from server

Receive response message from server

+COAPRECV Receive response message from server

	Response 1)
--	----------------

	+COAPRECV: <request or response>,from session <coap_id>,<received code>,<received tid>[,<len>,<data>]
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<request or response>	The message type of COAP server response.
<coap_id>	The COAP server response which coap session
<received code>	The received code of the message
<received tid>	The received tid of the message
<len>	The response data len.
<data>	The response data.

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14 AT Commands for LWM2M

14.1 Overview

Command	Description
AT+LWSTART	Start LWM2M service
AT+LWSTOP	Stop LWM2M Service
AT+LWCNF	Config the LWM2M
AT+LWOPEN	Register to a LWM2M server
AT+LWCLOSE	Deregister to LWM2M server
AT+LWADDOBJ	Add a LWM2M object
AT+LWDELOBJ	Delete a LWM2M object
AT+LWREADRSP	Send read response to LWM2M server
AT+LWWRITERSP	Send write response to LWM2M server
AT+LWEXECUTERSP	Send execute response to LWM2M server

14.2 Detailed Description of AT Commands for LWM2M

14.2.1 AT+LWSTART Start LWM2M service

AT+LWSTART is used to start LWM2M service by activating PDP context. You must execute AT+LWSTART before any other LWM2M related operations.

AT+LWSTART Start LWM2M service	
Test Command AT+LWSTART=?	Response OK
Execution Command AT+LWSTART	Response 1) OK 2)

	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Examples

```
AT+LWSTART
OK
```

14.2.2 AT+LWSTOP Stop LWM2M Service

AT+LWSTOP is used to stop LWM2M service by deactivating PDP context When you are no longer using the LWM2M service, use this command.

AT+LWSTOP Stop LWM2M Service

Test Command	Response
AT+LWSTOP=?	OK
Execution Command	Response
AT+LWSTOP	1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Examples

```
AT+LWSTOP
OK
```

14.2.3 AT+LWCNF Config the LWM2M

AT+LWCNF is used to config the LWM2M.

AT+LWCFN Config the LWM2M

<p>Test Command</p> <p>AT+LWCFN=?</p>	<p>Response</p> <p>+LWCFN: "server",<ipaddress> +LWCFN: "serverport",<serverport> +LWCFN: "endpointname",<endpointname> +LWCFN: "connecttype",(4,6) +LWCFN: "lifetime",<lifetime> +LWCFN: "localport",<localport></p> <p>OK</p>
<p>Write Command</p> <p>AT+LWCFN="server",<ipaddress> AT+LWCFN="serverport",<serverport> AT+LWCFN="endpointname",< endpointname> AT+LWCFN="connectiontype",4 or 6 AT+LWCFN="lifetime",<lifetime> AT+LWCFN="localport",<localport></p>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>9000ms</p>
<p>Reference</p>	

Defined Values

<server>	The LWM2M server address URL or ipaddress.
<serverport>	The LWM2M server port,the range is from 0 to 65535.
<endpointname>	The LWM2M client device name.
<connecttype>	The type of LWM2M server address IPV4 or IPV6.
<lifetime>	The connection life time.the max value is 65535.
<localport>	The LWM2M client device local port. The range is from 0 to 65535.

Examples

AT+LWCFN="server","leshan.eclipseprojects.io"

OK

AT+LWCFN="serverport","5683"

OK

AT+LWCFN="endpointname","simcom"

OK

AT+LWCNF="connectiontype", "4"

OK

AT+LWCNF="lifetime", "800"

OK

AT+LWCNF="localport", "56833"

OK

14.2.4 AT+LWOPEN Register to a LWM2M server

AT+LWOPEN is used to register to a LWM2M sever, make sure you register to a LWM2M sever before you execute AT+LWCLOSE command.

AT+LWOPEN Register to a LWM2M server

Test Command AT+LWOPEN=?	Response OK
Execute Command AT+LWOPEN	Response 1) OK +LMOPEN:<lwm2mld> 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mld>	The LWM2M session ID.the range is from 0 to 1.
-----------	--

Examples

AT+LWOPEN=?

OK

AT+LWOPEN

OK

+LMOPEN:0

14.2.5 AT+LWCLOSE Deregister to a LWM2M server

This command is used to Deregister to a LWM2M server.

AT+LWCLOSE Deregister to a LWM2M server

Test Command AT+LWCLOSE=?	Response +LWCLOSE: <lwm2mId> OK
Write Command AT+LWCLOSE=<lwm2mId>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId> AT+LWOPEN return the LWM2M session ID.the range is from 0 to 1.

Examples

AT+LWCLOSE=0
OK

14.2.6 AT+LWADDOBJ Add a LWM2M object

AT+LWADDOBJ is used to add a LWM2M object.

AT+LWADDOBJ Add a LWM2M object

Test Command AT+LWADDOBJ=?	Response +LWADDOBJ: <lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>[,<resourceId>...] OK
Write Command AT+LWADDOBJ=<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<resourceId>....	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	AT+LWOPEN return the LWM2M session ID.the range is from 0 to 1.
<objectId>	The LWM2M object ID you want to add.the range is from 0 to 65535, But 0-7 has already used.
<instanceId>	The LWM2M object instance ID. The range is from 0 to 65535.
<resourceCnt>	The LWM2M resource count. The range is from 1 to 15.
<resourceId>	The LWM2M resource ID. The range is from 0 to 65535.

Examples

```
AT+LWADDOBJ=?
+LWADDOBJ:
<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>[,<resourceId>...]

OK
AT+LWADDOBJ=0,3303,0,6,5518,5601,5602,5603,5604,5605
OK
```

14.2.7 AT+LWDELOBJ Delete a LWM2M object

AT+LWDELOBJ is used to delete a LWM2M object.

AT+LWDELOBJ Delete a LWM2M object

Test Command AT+LWDELOBJ=?	Response +LWDELOBJ: <lwm2mId>,<objectId> OK
Write Command AT+LWDELOBJ=<lwm2mId>,<objectId>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	AT+LWOPEN return the LWM2M session ID,the range is from 0 to 1.
<objectId>	The LWM2M object ID you want to delete.the range is from 0 to 65535.

Examples

```
AT+LWDELOBJ=?
+LWDELOBJ: <lwm2mId>,<objectId>

OK
AT+LWDELOBJ=0,3303
OK
```

14.2.8 AT+LWREADRSP Send read response to LWM2M server

You can use this command to send read response to LWM2M server.

AT+LWREADRSP Send read response to LWM2M server

Test Command AT+LWREADRSP=?	Response +LWREADRSP: <lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>[,<resourceId>,<valuetype>...]
Write Command AT+LWREADRSP=<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>,<resourceId>,<valuetype>...	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID,according to "+LWREAD" returned.
<objectId>	The LWM2M object ID,according to "+LWREAD" returned.
<instanceId>	The LWM2M object instance ID,according to "+LWREAD" returned.
<resourceCnt>	The LWM2M resource count,according to "+LWREAD" returned.
<resourceId>	The LWM2M resource ID,according to "+LWREAD" returned.
<valuetype>	The type of value of reponse. <ul style="list-style-type: none"> ● I Integer ● F Float ● B Boolean ● D UINT8 array data ● S String
<valuelen>	The length of value.
<value>	The reponse value.

Examples

AT+LWREADRSP=?

+LWREADRSP:

<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>[,<resourceId>,<valuetype>...]

OK

```
+LWREAD:0,3303,0,1,5602
AT+LWREADRSP= 0,3303,0,1,5602,"F",5,"15623"
OK
```

NOTE

Must execute the this command after URC "+LWREAD" returned."+LWREAD" see 14.2.11

14.2.9 AT+LWWRITERSP Send write response to LWM2M server

This command is used to send a response to LWM2M server.

AT+LWWRITERSP Send reponse to a LWM2M server

Test Command AT+LWWRITERSP=?	Response +LWWRITERSP: <lwm2mId>,<result> OK
Execute Command AT+LWWRITERSP=<lwm2mId>,<result>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID,according to "+LWWRITE" returned.
<result>	According to "+LWWRITE",return the result, please refer to the end of this chapter for details.

Examples

```
+LMWRITE: 0,3335,0,1,5750,S,1,"p"
AT+LWWRITERSP =0,0
OK
```


NOTE

Must execute the this command after URC "+LWWRITE" returned." +LWWRITE" see 14.2.12

14.2.10 AT+LWEXECUTERSP Send execute response to LWM2M server

You can use AT+LWEXECUTERSP send response to LWM2M server.

AT+LWEXECUTERSP Send response to LWM2M server

Test Command AT+LWEXECUTERSP=?	Response +LWEXECUTERSP: <lwm2mId>,<result> OK
Write Command AT+LWEXECUTERSP=<lwm2mId>,<result>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID,according to "+LWEXECUTE" returned.
<result>	According to "+LWEXECUTE",return the result, please refer to the end of this chapter for details.

Examples

AT+LWEXECUTERSP=?

OK

+LWEXECUTE: 0,3303,0,5605,1,"0"

AT+LWEXECUTERSP=0,0

OK

NOTE

Must execute the this command after URC "+LWEXECUTE returned." "+LWEXECUTE" see 14.2.13

14.2.11 +LWREAD LWM2M client response of LWM2M server operate read

LWM2M client response of LWM2M server operate read.

+LWREAD LWM2M client response of LWM2M server operate read

	Response +LWREAD:<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID.the range is from 0 to 1.
<objectId>	The LWM2M object ID you want to add.the range is from 8 to 65535.
<instanceId>	The LWM2M object instance ID. The range is from 0 to 65535.
<resourceCnt>	The LWM2M resource count. The range is from 1 to 15.
<resourceId>	The LWM2M resource ID. The range is from 0 to 65535.

14.2.12 +LWWRITE LWM2M client response of LWM2M server operate write

LWM2M client response of LWM2M server operate write.

+LWWRITE LWM2M client response of LWM2M server operate read

	Response +LWWRITE:
--	-----------------------

	<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>,<resourceId>,<valuetype>...
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID.the range is from 0 to 1.
<objectId>	The LWM2M object ID you want to add.the range is from 8 to 65535.
<instanceId>	The LWM2M object instance ID. The range is from 0 to 65535.
<resourceCnt>	The LWM2M resource count. The range is from 1 to 15.
<resourceId>	The LWM2M resource ID. The range is from 0 to 65535.
<valuetype>	The type of value of reponse. <ul style="list-style-type: none"> ● I Integer ● F Float ● B Boolean ● D UINT8 array data
	S String
<valuelen>	The length of value.
<value>	The reponse value.

14.2.13 +LWEXECUTE LWM2M client response of LWM2M server operate execute

LWM2M client response of LWM2M server operate execute.

+LWEXECUTE LWM2M client response of LWM2M server operate execute

	Response 1) +LWEXECUTE: <lwm2mId>,<objectId>,<instanceId>,<resourceId>,<len>,<buffer>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<lwm2mId>	The LWM2M session ID.the range is from 0 to 1.
<objectId>	The LWM2M object ID.the range is from 8 to 65535.

<instanceId>	The LWM2M object instance ID. The range is from 0 to 65535.
<resourceId>	The LWM2M resource count. The range is from 1 to 15.
<len>	The response buffer len.
<buffer>	The response buffer.

14.3 Command Result Codes

<result>	Description
0	No error
1	Ignore
65	Created
66	Deleted
68	Changed
69	Content
95	Continue
128	Bad request
129	Unauthorized
130	Bad option
132	Not found
133	Method no allowed
134	Not acceptable
136	Req entity incomplete
140	Precondition failed
141	Entity too large
160	Internal server error
161	Not implemented
163	Service unavailable

15 AT Commands for CTBURST

15.1 Overview of AT Commands for CTBURST

Command	Description
AT+CTBURST	The RF TX Burst Test

15.2 Detailed Description of AT Commands for CTBURST(CAT1)

15.2.1 AT+CTBURST The TX Burst Test

AT+CTBURST The RF TX Burst Test	
Test Command AT+CTBURST=?	Response +CTBURST: (0-1),(1-74),(7000-27000),(80-104) OK
Write Command AT+CTBURST=<mode>[,<b and>,<channel>,<power>]	Response If mode is 0 +CTBURST: TX OFF OK If mode is 1 +CTBURST: TX ON OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	Start/stop TX the burst/waveform 0 – stop RF TX 1 – start RF TX
<band>	The band of burst/waveform to be sent 1~74, in common use band numbers: 1/3/5/8/20/28
<channel>	Frequency channel, the range is different according to different band 7000~27000 unit: 100 KHZ
<power>	The power unit: 0.25 dBm, the value is different for different band

Examples

```

AT+CFUN=0 // Minimum functionality
OK

+QCPIN: SIM NOT READY
AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

AT+CTBURST=1,8,9000,92
+CTBURST: TX ON //Start RF TX Power of LTE BAND8 the frequency
is 900 MHZ the power is 23 dBm

OK

```

NOTE

- To test each item, close the previous item first ,then restart the module.
- The band and frequency must correspond; otherwise, the system will restart.
- <band> refer to hardware doc, not support all band.
- If <mode>=1, all the other parameters are required.

16 Error Codes and Reset Reasons

16.1 Summary of CME ERROR Codes

Final result code **+CME ERROR: <err>** indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<err> values used by common messaging commands:

16.1.1 General Errors

Code of <err>	Error Text
1	MT not connection
2	MT link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	memory full
21	invalid index
22	not found
23	memory failure

24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency call only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required
49	EAP method not support
50	incorrect Parameters
51	command implemented but currently disabled
52	command aborted by user
53	not attached to network due to MT functionality restrictions
54	modem not allowed - MT restricted to emergency calls only
55	operation not allowed because of MT functionality restrictions
56	fixed dial number only allowed - called number is not a fixed dial number
57	temporarily out of service due to other MT usage
58	language/alphabet not supported
59	unexpected data value
60	system failure
61	data missing
62	call barred
63	message waiting indication subscription failure
100	unknown
103	illegal MS

106	illegal ME
107	GPRS services not allowed
108	GPRS services and non GPRS services not allowed
111	PLMN not allowed
112	location area not allowed
113	roaming not allowed in this location area
114	GPRS services not allowed in this plmn
115	No suitable cells in location area
122	Congestion
126	Insufficient resources
127	Mission or unknown APN
128	SIM PUK required
129	SIM failure
130	SIM busy
131	SIM wrong
132	incorrect password
133	requested service option not subscribed
134	service option temporarily out of order
140	Feature not supported
141	Semantic errors in the TFT operation
142	Syntactical errors in the TFT operation
143	Unknown PDP context
144	Semantic errors in packet filters
145	Syntactical errors in packet filters
146	PDP context without TFT already activated
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
171	Last PDN disconnection not allowed
172	Semantically incorrect message
173	Mandatory information element error
174	Information element nonexistent or not implemented
175	Conditional ie error
176	Protocol error unspecified
177	Operator determined barring
178	Max number of PDP contexts reached
179	Requested APN not supported in current rat and PLMN combination
180	Request rejected bearer control mode violation
181	Unsupported oci value
182	User data transmission via control plane is congested
301	Internal error base
302	UE busy
303	Not power on

304	PDN not active
305	PDN not valid
306	PDN invalid type
307	PDN no parameter
308	UE fail
309	PDN type and APN duplicate used

16.1.2 Error Code for Socket Command

Code of <err>	Error Text
402	Parameter invalid
403	Too much socket instance
404	Create socket error
405	operation not supported
406	Cannot find the socket
407	Socket Connect fail
408	Socket bind fail
409	Send data fail
410	The socket status is not connected
411	The socket status is already connected
412	The socket status is invalid
413	The socket connect timeout
414	The socket close fail
415	The socket happen fatal error
416	Cannot allocate more memory
417	No more DL buffer resource
418	The socket is connecting
419	UL sequence is invalid
420	Send request fail
421	Unknown error

16.1.3 Error Code for CTM2M

Code of <err>	Error Text
1	Other errors
2	Parameter quantity error
3	Parameter value error
4	command cannot be issued
8	The platform connection parameter is not initialized

14	The Data field length exceeds the limit
15	The Object19 transport channel does not exist
16	Unable to obtain IMSI
17	Data fields are not even in length
33	Operation failed. Logged in
34	Failed to create LWM2M session
950	Engine exception, recovering
951	The connection is unavailable, the network is congested
952	Operation failed, overwrite level 2
953	Engine exception, need to restart
954	Operation failed, not logged in
955	Operation failed, log in
957	The connection is temporarily unavailable
959	The operation is not allowed, only if ON_UQMode=2
960	Operation failed. No authentication encryption string is set
961	Error setting allowed only when IDAuth_Mode=2/3
968	Functionality not supported or otherwise
969	Lifetime exceeds the limit
970	Cache queue overruns
972	Invalid Uri_str

16.2 Summary of CMS ERROR Codes

Final result code **+CMS ERROR: <err>** indicates an error related to message service or network. The operation is similar to ERROR result code. None of the following commands in the same Command line is executed. Neither ERROR nor OK result code shall be returned.

<err> values used by common messaging commands:

Code of <err>	Meaning
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	USIM not inserted
311	USIM PIN required
312	PH-(U)SIM PIN required
313	USIM failure
314	USIM busy

315	USIM wrong
316	USIM PUK required
317	USIM PIN2 required
318	USIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
500	unknown error

16.3 Summary of Unsolicited Result Codes

URC	Description	AT Command
-----	-------------	------------