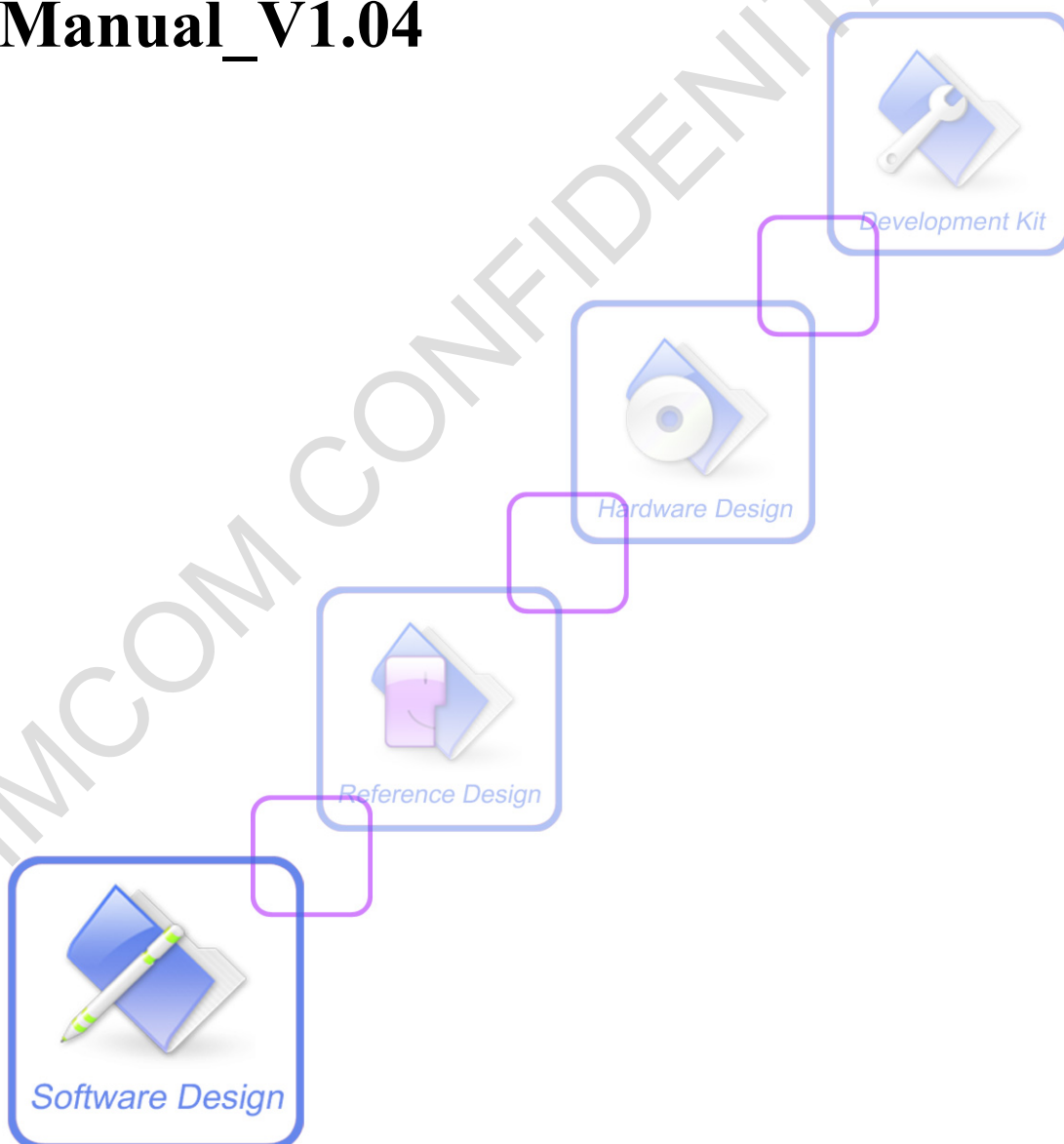




# **SIM7000 Series\_AT Command Manual\_V1.04**



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## Version History

| Version | Date       | Chapter   | What is new   |
|---------|------------|---|---|
| V1.00   | 2017-06-22 |   | New version   |
| V1.01   | 2017-09-08 | 5.2.22 AT+CPSI<br>5.2.23 AT+CGNAPN<br>5.2.24 AT+CSDP<br>5.2.25 AT+MCELLLOCK<br>5.2.26 AT+NCELLLOCK<br>5.2.27 AT+NBSC<br>Chapter 7<br>Chapter 9<br>Chapter 10<br>Chapter 13  | Add AT command<br>Add AT command<br>Add AT command<br>Add AT command<br>Add AT command<br>Add AT command<br>Add IP<br>Add HTTP<br>Add PINGs<br>Add GNSS   |
| V1.02   | 2017-12-18 | All<br>1.7.1<br>1.7.2<br>2.2.2 ATD<br>3.2.14 AT+CREG<br>5.2.28 AT+CIPMODE<br>5.2.29 AT+CRRSTATE<br>5.2.30 AT+CBANDCFG<br>8.2.2 AT+CIPSTART<br>8.2.32 AT+CIPTKA<br>8.2.33 AT+CIPOPTION<br>Chapter 11<br>Chapter 12<br>13.3.10 AT+CGNSTST | Delete ATZ,AT&F,AT&V<br>Modify parameter save mode and max response time<br>Add AUTO_SAVE_REBOOT<br>Add Max response time<br>Delete parameters <;><br>Change description of parameters<br>Add AT command<br>Add AT command<br>Add AT command<br>Change range of parameter <n> from 0...5 to 0...7<br>Add AT command<br>Add AT command<br>Add FTP<br>Add NTP<br>Add AT Command |
| V1.03   | 2018-05-08 | 3.2.17 AT+CPOL<br>3.2.24 AT+CNUM<br>5.2.1 AT+CEDRXS   | Modify parameters<br>Add AT Command<br>Modify range of <AcT-type>   |

|       |            |                          |                 |
|-------|------------|--------------------------|-----------------|
|       |            | 5.2.31 AT+CNACT          | Add AT Command  |
|       |            | 5.2.32 AT+CEDUMP         | Add AT Command  |
|       |            | 5.2.33 AT+CNBS           | Add AT Command  |
|       |            | 5.2.34 AT+CNDS           | Add AT Command  |
|       |            | 5.2.35 AT+CENG           | Add AT Command  |
|       |            | 9.2.9 AT+HTTPTOFS        | Add AT Command  |
|       |            | Charpter 13              | Add OneNet      |
|       |            | Charpter 14              | Add Telecom IOT |
|       |            | Charpter 15              | Add GNSS        |
|       |            | Charpter 16              | Add File system |
|       |            | Charpter 17              | Add SAT         |
|       |            | Charpter 18              | Add SSL         |
| V1.04 | 2108-12-25 | 5.2.36 AT+CNACTCFG       | Add AT Command  |
|       |            | 5.2.37 AT+CTLIIC         | Add AT Command  |
|       |            | 5.2.38 AT+CWIIC          | Add AT Command  |
|       |            | 5.2.39 AT+CRIIC          | Add AT Command  |
|       |            | 5.2.40 AT+CMCFG          | Add AT Command  |
|       |            | 5.2.41 AT+CSIMLOCK       | Add AT Command  |
|       |            | 5.2.42 AT+CRATSRCH       | Add AT Command  |
|       |            | 5.2.43 AT+SPWM           | Add AT Command  |
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|       |            | 13.2.21 +MIPLDISCOVER    | Add AT Command  |
|       |            | 13.2.22 +MIPLPARAMETER   | Add AT Command  |
|       |            | 13.2.23 +MIPLEVENT       | Add AT Command  |

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|  |  | 15.2.13 AT+CGNSRTMS | Add AT Command                         |
|  |  | 18.2.2 AT+CASSLCFG  | Extend AT command                      |
|  |  | 18.2.8 AT+CACFG     | Add AT Command                         |
|  |  | 18.2.9 AT+CASWITCH  | Add AT Command                         |
|  |  | Chapter 19          | Add PING                               |
|  |  | Chapter 20          | Add Supported Unsolicited Result Codes |

# 1 Introduction

## 1.1 Scope of the document

This document presents the AT Command Set for SIMCom SIM7000 Series, including SIM7000A, SIM700C, SIM7000E, SIM7000C-N, SIM7000E-N, SIM7000JC and SIM7000G.

## 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.

The AT Command set implemented by SIM7000 Series is a combination of 3GPP TS 27.005, 3GPP TS 27.007 and ITU-T recommendation V.25ter and the AT commands developed by SIMCom.

**Note:** Only enter AT Command through serial port after SIM7000 Series is powered on and Unsolicited Result



Code "RDY" is received from serial port. If auto-bauding is enabled, the Unsolicited Result Codes "RDY" and so on are not indicated when you start up the ME, and the "AT" prefix, or "at" prefix must be set at the beginning of each command line.

All these AT commands can be split into three categories syntactically: "basic", "S parameter", and "extended". These are as follows:

#### 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 Supported character sets

The SIM7000 Series AT Command interface defaults to the **IRA** character set. The SIM7000 Series supports the following character sets:

GSM format

UCS2

IRA

The character set can be set and interrogated using the "AT+CSCS" Command (3GPP TS 27.007). The character set is defined in GSM specification 3GPP TS 27.005.

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.

### 1.6 Flow control

Flow control is very important for correct communication between the GSM engine and DTE. For in the case such as a data or fax call, the sending device is transferring data faster than the receiving side is ready to accept. When the receiving buffer reaches its capacity, the receiving device should be capable to cause the sending device to pause until it catches up.

There are basically two approaches to achieve data flow control: software flow control and hardware flow control. SIM7000 Series support both two kinds of flow control.

In Multiplex mode, it is recommended to use the hardware flow control.

#### 1.6.1 Software flow control (XON/XOFF flow control)

Software flow control sends different characters to stop (XOFF, decimal 19) and resume (XON, decimal 17) data flow. It is quite useful in some applications that only use three wires on the serial interface.

The default flow control approach of SIM7000 Series is hardware flow control (RTS/CTS flow control), to enable software flow control in the DTE interface and within GSM engine, type the following AT Command:

**AT+IFC=1, 1**

Ensure that any communications software package (e.g. Hyper terminal) uses software flow control.

**NOTE:**

Software Flow control should not be used for data calls where binary data will be transmitted or received (e.g. TCP/IP) as the DTE interface may interpret binary data as flow control characters.

**1.6.2 Hardware flow control (RTS/CTS flow control)**

Hardware flow control achieves the data flow control by controlling the RTS/CTS line. When the data transfer should be suspended, the CTS line is set inactive until the transfer from the receiving buffer has completed. When the receiving buffer is ok to receive more data, CTS goes active once again.

To achieve hardware flow control, ensure that the RTS/CTS lines are present on your application platform.

**1.7 Definitions****1.7.1 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.

**1.7.2 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.

## 2 AT Commands According to V.25TER

These AT Commands are designed according to the ITU-T (International Telecommunication Union, Telecommunication sector) V.25ter document.

### 2.1 Overview of AT Commands According to V.25TER

| Command | Description   |
|---------|---|
| A/      | Re-issues the last command given  |
| ATD     | Mobile originated call to dial a number   |
| ATE     | Set command echo mode   |
| ATH     | Disconnect existing connection  |
| ATI     | Display product identification information  |
| ATL     | Set monitor speaker loudness  |
| ATM     | Set monitor speaker mode  |
| +++     | Switch from data mode or ppp online mode to command mode                                      |
| ATO     | Switch from command mode to data mode   |
| ATQ     | Set result code presentation mode   |
| ATS0    | Set number of rings before automatically answering the call                                   |
| ATS3    | Set command line termination character  |
| ATS4    | Set response formatting character   |
| ATS5    | Set command line editing character  |
| ATS6    | Pause before blind dialling   |
| ATS7    | Set number of seconds to wait for connection completion                                       |
| ATS8    | Set number of seconds to wait for comma dial modifier encountered in dial string of D command |
| ATS10   | Set disconnect delay after indicating the absence of data carrier                             |
| ATV     | TA response format  |
| ATX     | Set connect result code format and monitor call progress                                      |
| ATZ     | Reset default configuration   |
| AT&C    | Set DCD function mode   |
| AT&D    | Set DTR function mode   |
| AT&F    | Factory defined configuration   |
| AT&V    | Display current configuration   |
| AT&E    | Set CONNECT Result Code Format About Speed  |
| AT+GCAP | Request complete TA capabilities list   |

|        |  |
|--------|--|
| AT+GMI | Request manufacturer identification                    |
| AT+GMM | Request TA model identification                        |
| AT+GMR | Request TA revision identification of software release |
| AT+GOI | Request global object identification                   |
| AT+GSN | Request TA serial number identification (IMEI)         |
| AT+ICF | Set TE-TA control character framing                    |
| AT+IFC | Set TE-TA local data flow control                      |
| AT+IPR | Set TE-TA fixed local rate                             |

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

### 2.2.1 A/ Re-issues the Last Command Given

| A/ Re-issues the Last Command Given |  |
|-------------------------------------|--|
| Execution<br>Command<br>A/          | Response<br>Re-issues the previous Command |
| Reference<br>V.25ter                | Note                                       |

### 2.2.2 ATD Mobile Originated Call to Dial A Number

| ATD Mobile Originated Call to Dial A Number   |  |
|---|--|
| Execution<br>Command<br>ATD<n>[<mgs<br>m<br>] | <p>Response</p> <p>This command can be used to set up outgoing data calls. It also serves to control supplementary services.</p> <p>Note: This command may be aborted generally by receiving an <b>ATH</b> Command or a character during execution. The aborting is not possible during some states of connection establishment such as handshaking.</p> <p>If error is related to ME functionality<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>If no dial tone and (parameter setting <b>ATX2</b> or <b>ATX4</b>)<br/><b>NO DIALTONE</b></p> <p>If busy and (parameter setting <b>ATX3</b> or <b>ATX4</b>)<br/><b>BUSY</b></p> <p>If a connection cannot be established<br/><b>NO CARRIER</b></p> |

|                       |  |
|-----------------------|--|
|                       | <p>If the remote station does not answer<br/><b>NO ANSWER</b></p> <p>If connection successful and non-voice call.<br/><b>CONNECT</b>&lt;text&gt; TA switches to data mode.<br/>Note: &lt;text&gt; output only if <b>ATX</b>&lt;value&gt; parameter setting with the &lt;value&gt; &gt;0</p> <p>When TA returns to command mode after call release<br/><b>OK</b></p> <p>Parameters<br/>&lt;n&gt; String of dialing digits and optionally V.25ter modifiers dialing digits: <b>0-9, *, #, +, A, B, C</b><br/>Following V.25ter modifiers are ignored:<br/><b>,(comma), T, P, !, W, @</b></p> <p><b>Emergency call:</b><br/>&lt;n&gt; Standardized emergency number 112 (no SIM needed)<br/>&lt;mgs&gt; String of <b>GSM</b> modifiers:<br/><b>I</b> Activates <b>CLIR</b> (Disables presentation of own number to called party)<br/><b>i</b> Deactivates <b>CLIR</b> (Enable presentation of own number to called party)<br/><b>G</b> Activates Closed User Group invocation for this call only<br/><b>g</b> Deactivates Closed User Group invocation for this call only</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | Timeout set with <b>ATS7</b> (data call)   |
| Reference V.25ter     | Note   |

### 2.2.3 ATE Set Command Echo Mode

| ATE Set Command Echo Mode               |   |
|---|---|
| Execution Command<br><b>ATE</b> <value> | <p>Response</p> <p>This setting determines whether or not the TA echoes characters received from TE during Command state.<br/><b>OK</b></p> |
|   | Parameters  |

|                       |   |
|-----------------------|---|
|                       | <b>&lt;value&gt;</b> 0   Echo mode off<br><u>1</u> Echo mode on |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | Note  |

#### 2.2.4 ATH Disconnect Existing Connection

| ATH Disconnect Existing Connection |   |
|------------------------------------|---|
| Execution Command<br><b>ATH</b>    | Response<br>Disconnect existing call by local TE from Command line and terminate call<br><b>OK</b><br>Note: OK is issued after circuit 109(DCD) is turned off, if it was previously on. |
| Parameter Saving Mode              | NO_SAVE   |
| Max Response Time                  | 20s   |
| Reference V.25ter                  | Note  |

#### 2.2.5 ATI Display Product Identification Information

| ATI Display Product Identification Information |  |
|--|--|
| Execution Command<br><b>ATI</b>                | Response<br>TA issues product information text<br><br>Example:<br>SIM7000 R1351<br><br><b>OK</b> |
| Parameter Saving Mode                          | NO_SAVE  |
| Max Response Time                              | -  |
| Reference V.25ter                              | Note   |



## 2.2.6 ATL Set Monitor speaker loudness

| ATL Set Monitor speaker loudness |                                   |
|----------------------------------|-----------------------------------|
| Execution Command                | Response                          |
| ATL<value>                       | <b>OK</b>                         |
|                                  | Parameters<br><value> 0..3 Volume |
| Parameter Saving Mode            | NO_SAVE                           |
| Max Response Time                | -                                 |
| Reference V.25ter                | Note<br>No effect in GSM          |

## 2.2.7 ATM Set Monitor Speaker Mode

| ATM Set Monitor Speaker Mode |                                 |
|------------------------------|---------------------------------|
| Execution Command            | Response                        |
| ATM<value>                   | <b>OK</b>                       |
|                              | Parameters<br><value> 0..2 Mode |
| Parameter Saving Mode        | NO_SAVE                         |
| Max Response Time            | -                               |
| Reference V.25ter            | Note<br>No effect in GSM        |

## 2.2.8 +++ Switch from Data Mode or PPP Online Mode to Command Mode

| +++ Switch from Data Mode or PPP Online Mode to Command Mode |   |
|--|---|
| Execution Command  | Response  |
| +++  | The +++ character sequence causes the TA to cancel the data flow over the AT interface and switch to Command mode. This allows you to enter AT Command while maintaining the data connection to the remote server.<br><b>OK</b><br><br>To prevent the +++ escape sequence from being misinterpreted as data, it should comply to following sequence:<br>No characters entered for T1 time (1 second)<br>"+++" characters entered with no characters in between (1 second)<br>No characters entered for T1 timer (1 second)<br>Switch to Command mode, otherwise go to step 1. |

|                       |   |
|-----------------------|---|
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | Note<br>To return from Command mode back to data mode: Enter <b>ATO</b> . |

## 2.2.9 ATO Switch from Command Mode to Data Mode

| ATO Switch from Command Mode to Data Mode |  |
|---|--|
| Execution Command<br>ATO[n]               | <p>Response</p> <p>TA resumes the connection and switches back from command mode to data mode.</p> <p><b>CONNECT</b><br/>If connection is not successfully resumed</p> <p><b>ERROR</b><br/>else<br/>TA returns to data mode from command mode <b>CONNECT &lt;text&gt;</b><br/>Note: &lt;text&gt; only if parameter setting <b>ATX&gt;0</b></p> <p>Parameter<br/>&lt;n&gt; 0 Switch from command mode to data mode.</p> |
| Parameter Saving Mode                     | NO_SAVE  |
| Max Response Time                         | -  |
| Reference V.25ter                         | Note   |

## 2.2.10 ATQ Set Result Code Presentation Mode

| ATQ Set Result Code Presentation Mode |   |
|---------------------------------------|---|
| Execution Command<br>ATQ<n>           | <p>Response</p> <p>This parameter setting determines whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting.</p> <p>If &lt;n&gt;=0:<br/><b>OK</b></p> <p>If &lt;n&gt;=1:<br/>(none)</p> <p>Parameters<br/>&lt;n&gt; 0 TA transmits result code</p> |

|                       |   |
|-----------------------|---|
|                       | 1 Result codes are suppressed and not transmitted |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | Note  |

### 2.2.11 ATSO Set Number of Rings before Automatically Answering the Call

| ATSO Set Number of Rings before Automatically Answering the Call |  |
|--|--|
| Read Command ATSO?   | <p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command ATSO=<n>   | <p>Response</p> <p>This parameter setting determines the number of rings before auto-answer.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;n&gt;     0     Automatic answering is disable.</p> <p>         1-255   Number of rings the modem will wait for before answering the phone if a ring is detected.</p>   |
| Parameter Saving Mode  | -  |
| Max Response Time  | -  |
| Reference V.25ter  | <p>Note</p> <p>If &lt;n&gt; is set too high, the calling party may hang up before the call can be answered automatically.</p> <p>If using cmux port, <b>ATH</b> and <b>AT+CHUP</b> can hang up the call (automatically answering) only in the CMUX channel 0.</p> <p>If using dual-physical serial port, <b>ATH</b> and <b>AT+CHUP</b> can hang up the call (automatically answering) only in UART1.</p> |

### 2.2.12 ATS3 Set Command Line Termination Character

| ATS3 Set Command Line Termination Character |                                  |
|---|----------------------------------|
| Read Command ATS3?                          | <p>Response</p> <p>&lt;n&gt;</p> |

|  |  |
|--|--|
|  | <b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>ATS3=&lt;n&gt;</b> | Response<br>This parameter setting determines the character recognized by TA to terminate an incoming command line. The TA also returns this character in output.<br><b>OK</b><br><br><b>ERROR</b> |
|  | Parameters<br><b>&lt;n&gt;</b> <u>13</u> Command line termination character  |
| Parameter Saving Mode                  | -  |
| Max Response Time                      | -  |
| Reference<br>V.25ter                   | Note<br>Default 13 = CR. It only supports default value.   |

### 2.2.13 ATS4 Set Response Formatting Character

| <b>ATS4 Set Response Formatting Character</b> |  |
|---|--|
| Read Command<br><b>ATS4?</b>                  | Response<br><b>&lt;n&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>ATS4=&lt;n&gt;</b>        | Response<br>This parameter setting determines the character generated by the TA for result code and information text.<br><b>OK</b><br><br><b>ERROR</b> |
|   | Parameters<br><b>&lt;n&gt;</b> <u>10</u> Response formatting character   |
| Parameter Saving Mode                         | -  |
| Max Response Time                             | -  |
| Reference                                     | Note   |

|         |  |
|---------|--|
| V.25ter | Default 10 = LF. It only supports default value. |
|---------|--|

## 2.2.14 ATS5 Set Command Line Editing Character

| ATS5 Set Command Line Editing Character |   |
|---|---|
| Read Command<br>ATS5?                   | <p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>ATS5=<n>               | <p>Response</p> <p>This parameter setting determines the character recognized by TA as a request to delete from the command line the immediately preceding character.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;n&gt; 0-8-127 Response formatting character</p> |
| Parameter Saving Mode                   | -   |
| Max Response Time                       | -   |
| Reference<br>V.25ter                    | <p>Note</p> <p>Default 8 = Backspace.</p>   |

## 2.2.15 ATS6 Pause Before Blind Dialling

| ATS6 Pause Before Blind Dialling |  |
|----------------------------------|--|
| Read Command<br>ATS6?            | <p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p>  |
| Write Command<br>ATS6=<n>        | <p>Response</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;n&gt; 0-2-999 Time</p> |
| Parameter Saving Mode            | -  |
| Max Response                     | -  |

|           |                  |
|-----------|------------------|
| Time      |                  |
| Reference | Note             |
| V.25ter   | No effect in GSM |

### 2.2.16 ATS7 Set Number of Seconds to Wait for Connection Completion

| ATS7 Set Number of Seconds to Wait for Connection Completion |  |
|--|--|
| Read Command<br>ATS7?  | Response<br><n>  |
|  | OK   |
|  | Parameters<br>See Write Command  |
| Write Command<br>ATS7=<n>                                    | Response<br>This parameter setting determines the amount of time to wait for the connection completion in case of answering or originating a call.<br>OK   |
|  | ERROR  |
|  | Parameters<br><n>    0-255    Number of seconds to wait for connection completion  |
| Parameter Saving Mode  | -  |
| Max Response Time  | -  |
| Reference<br>V.25ter   | Note<br>If called party has specified a high value for ATS0=<n>, call setup may fail.<br>The correlation between ATS7 and ATS0 is important<br>Example: Call may fail if ATS7=30 and ATS0=20.<br>ATS7 is only applicable to data call. |

### 2.2.17 ATS8 Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command

| ATS8 Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command |                                 |
|--|---------------------------------|
| Read Command<br>ATS8?  | Response<br><n>                 |
|  | OK                              |
|  | Parameters<br>See Write Command |
| Write Command  | Response                        |

|                       |   |
|-----------------------|---|
| ATS8=<n>              | <b>OK</b>   |
|                       | <b>ERROR</b>  |
|                       | Parameters<br><n> 0-2-255 The value of this register determines how long the modem should pause when it sees a comma in the dialing string. |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference V.25ter     | Note<br>No effect in GSM  |

### 2.2.18 ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier

| ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier |  |
|---|--|
| Read Command<br>ATS10?  | Response<br><n>  |
|   | <b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br>ATS10=<n>  | Response<br>This parameter setting determines the amount of time that the TA will remain connected in absence of data carrier. If the data carrier is once more detected before disconnecting, the TA remains connected. |
|   | <b>OK</b>  |
|   | <b>ERROR</b>   |
| Parameter Saving Mode   | Parameters<br><n> 1-14-255 Number of tenths seconds of delay   |
|   | -  |
|   | -  |
| Max Response Time   | -  |
| Reference V.25ter   | Note   |

### 2.2.19 ATV TA Response Format

| ATV TA Response Format |  |
|------------------------|--|
| Execution Command      | Response<br>This parameter setting determines the contents of the header and trailer |



|                         |  |
|-------------------------|--|
| <b>ATV&lt;value&gt;</b> | <p>transmitted with result codes and information responses.</p> <p>When &lt;value&gt;=0</p> <p><b>0</b></p> <p>When &lt;value&gt;=1</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;value&gt;    0    Information response: &lt;text&gt;&lt;CR&gt;&lt;LF&gt;<br/> Short result code format: &lt;numeric code&gt;&lt;CR&gt;<br/> 1    Information response: &lt;CR&gt;&lt;LF&gt;&lt;text&gt;&lt;CR&gt;&lt;LF&gt;<br/> Long result code format: &lt;CR&gt;&lt;LF&gt;&lt;verbose code&gt;<br/> &lt;CR&gt;&lt;LF&gt;</p> <p>The result codes, their numeric equivalents and brief descriptions of the use of each are listed in the following table.</p> |
| Parameter Saving Mode   | -  |
| Max Response Time       | -  |
| Reference V.25ter       | Note   |

| ATV1              | ATV0                  | Description  |
|-------------------|-----------------------|--|
| OK                | 0                     | Acknowledges execution of a Command  |
| CONNECT           | 1                     | A connection has been established; the DCE is moving from Command state to online data state   |
| RING              | 2                     | The DCE has detected an incoming call signal from network  |
| NO CARRIER        | 3                     | The connection has been terminated or the attempt to establish a connection failed   |
| ERROR             | 4                     | Command not recognized, Command line maximum length exceeded, parameter value invalid, or other problem with processing the Command line                                   |
| NO DIALTONE       | 6                     | No dial tone detected  |
| BUSY              | 7                     | Engaged (busy) signal detected   |
| NO ANSWER         | 8                     | "@" (Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer (S7) |
| PROCEEDING        | 9                     | An AT command is being processed   |
| CONNECT<br><text> | Manufacturer-specific | Same as CONNECT, but includes manufacturer-specific text that may specify DTE speed, line speed, error control, data compression, or other status                          |

## 2.2.20 ATX Set CONNECT Result Code Format and Monitor Call Progress

| ATX Set CONNECT Result Code Format and Monitor Call Progress |   |
|--|---|
| Execution Command<br><b>ATX&lt;value&gt;</b>                 | <p>Response</p> <p>This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;value&gt;</b>    0    <b>CONNECT</b> result code only returned, dial tone and busy detection are both disabled.</p> <p>                 1    <b>CONNECT&lt;text&gt;</b> result code only returned, dial tone and busy detection are both disabled.</p> <p>                 2    <b>CONNECT&lt;text&gt;</b> result code returned, dial tone detection is enabled, busy detection is disabled.</p> <p>                 3    <b>CONNECT&lt;text&gt;</b> result code returned, dial tone detection is disabled, busy detection is enabled.</p> <p>                 4    <b>CONNECT&lt;text&gt;</b> result code returned, dial tone and busy detection are both enabled.</p> |
| Parameter Saving Mode  | -   |
| Max Response Time  | -   |
| Reference V.25ter  | Note  |

## 2.2.21 AT&C Set DCD Function Mode

| AT&C Set DCD Function Mode                        |   |
|---|---|
| Execution Command<br><b>AT&amp;C&lt;value&gt;</b> | <p>Response</p> <p>This parameter determines how the state of circuit 109 (<b>DCD</b>) relates to the detection of received line signal from the distant end.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;value&gt;</b>    0    <b>DCD</b> line is always ON</p> <p>                 1    <b>DCD</b> line is ON only in the presence of data carrier</p> |
| Parameter Saving Mode                             | -   |
| Max Response Time                                 | -   |

|                      |      |
|----------------------|------|
| Time                 |      |
| Reference<br>V.25ter | Note |

### 2.2.22 AT&D Set DTR Function Mode

| AT&D Set DTR Function Mode                          |   |
|---|---|
| Execution Command<br><b>AT&amp;D[&lt;value&gt;]</b> | <p>Response</p> <p>This parameter determines how the TA responds when circuit 108/2 (DTR) is changed from the ON to the OFF condition during data mode.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;value&gt;</b></p> <p>0 TA ignores status on DTR.</p> <p>1 ON-&gt;OFF on DTR: Change to Command mode with remaining the connected call.</p> <p>2 ON-&gt;OFF on DTR: Disconnect call, change to Command mode. During state DTR = OFF is auto-answer off.</p> |
| Parameter Saving Mode                               | -   |
| Max Response Time                                   | -   |
| Reference<br>V.25ter                                | Note  |

### 2.2.23 AT&E Set CONNECT Result Code Format About Speed

| AT&E Set CONNECT Result Code Format About Speed     |   |
|---|---|
| Execution Command<br><b>AT&amp;E[&lt;value&gt;]</b> | <p>This parameter setting determines to report Serial connection rate or Wireless connection speed. It is valid only ATX above 0.</p> <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;value&gt;</b></p> <p>0 Wireless connection speed in integer format.</p> <p>1 Serial connection rate in integer format. Such as: "115200"</p> |
| Parameter Saving Mode                               | NO_SAVE   |
| Max Response Time                                   | -   |

|                      |      |
|----------------------|------|
| Reference<br>V.25ter | Note |
|----------------------|------|

## 2.2.24 AT+GCAP Request Complete TA Capabilities List

| AT+GCAP Request Complete TA Capabilities List |   |
|---|---|
| Execution Command<br><b>AT+GCAP</b>           | <p>Response</p> <p>TA reports a list of additional capabilities.<br/><b>+GCAP:</b> list of supported &lt;name&gt;s</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;name&gt; +CGSM GSM function is supported</p> |
| Parameter Saving Mode                         | NO_SAVE   |
| Max Response Time                             | -   |
| Reference<br>V.25ter                          | Note  |

## 2.2.25 AT+GMI Request Manufacturer Identification

| AT+GMI Request Manufacturer Identification |   |
|--|---|
| Test Command<br><b>AT+GMI=?</b>            | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p>  |
| Execution Command<br><b>AT+GMI</b>         | <p>TA reports one or more lines of information text which permit the user to identify the manufacturer.</p> <p><b>SIMCOM_Ltd</b></p> <p><b>OK</b></p> |
| Parameter Saving Mode                      | NO_SAVE   |
| Max Response Time                          | -   |
| Reference<br>V.25ter                       | Note  |

## 2.2.26 AT+GMM Request TA Model Identification

| AT+GMM Request TA Model Identification |
|--|
|--|

|                                    |   |
|------------------------------------|---|
| Test Command<br><b>AT+GMM=?</b>    | Response<br><b>OK</b>   |
| Execution Command<br><b>AT+GMM</b> | TA reports one or more lines of information text which permit the user to identify the specific model of device.<br><b>&lt;model&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;model&gt;</b> Product model identification text |
| Parameter Saving Mode              | NO_SAVE   |
| Max Response Time                  | -   |
| Reference V.25ter                  | Note  |

#### 2.2.27 AT+GMR Request TA Revision Identification of Software Release

| <b>AT+GMR Request TA Revision Identification of Software Release</b> |  |
|--|--|
| Test Command<br><b>AT+GMR=?</b>                                      | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+GMR</b>                                   | TA reports one or more lines of information text which permit the user to identify the revision of software release.<br><b>Revision: &lt;revision&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;revision&gt;</b> Revision of software release |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference V.25ter  | Note   |

#### 2.2.28 AT+GOI Request Global Object Identification

| <b>AT+GOI Request Global Object Identification</b> |
|--|
|--|

|                                    |  |
|------------------------------------|--|
| Test Command<br><b>AT+GOI=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+GOI</b> | <p>Response</p> <p>TA reports one or more lines of information text which permit the user to identify the device, based on the ISO system for registering unique object identifiers.</p> <p><b>&lt;Object Id&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;Object Id&gt;</b> Identifier of device type<br/>see X.208, 209 for the format of &lt;Object Id&gt;</p> |
| Parameter Saving Mode              | NO_SAVE  |
| Max Response Time                  | -  |
| Reference V.25ter                  | Note   |

### 2.2.29 AT+GSN Request TA Serial Number Identification (IMEI)

| <b>AT+GSN Request TA Serial Number Identification(IMEI)</b> |   |
|---|---|
| Test Command<br><b>AT+GSN=?</b>                             | Response<br><b>OK</b>   |
| Execution Command<br><b>AT+GSN</b>                          | <p>Response</p> <p>TA reports the IMEI (international mobile equipment identifier) number in information text which permit the user to identify the individual ME device.</p> <p><b>&lt;sn&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;sn&gt;</b> IMEI of the telephone(International Mobile station Equipment Identity)</p> |
| Parameter Saving Mode                                       | NO_SAVE   |
| Max Response Time   | -   |
| Reference V.25ter   | Note<br>The serial number (IMEI) is varied by individual ME device.   |

## 2.2.30 AT+ICF Set TE-TA Control Character Framing

| AT+ICF Set TE-TA Control Character Framing  |   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|---|---|----------|--------------------------|--|--------------------------|--|--------------------------|--|--------------------------|--|--------------------------|--|--------------------------|----------|-------|--|--------|--|-------------|
| Test Command<br>AT+ICF=?                    | <p>Response</p> <p>+ICF: (list of supported &lt;format&gt;s),(list of supported &lt;parity&gt;s)</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| Read Command<br>AT+ICF?                     | <p>Response</p> <p>+ICF: &lt;format&gt;,&lt;parity&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| Write Command<br>AT+ICF=<format>[,<parity>] | <p>Response</p> <p>This parameter setting determines the serial interface character framing format and parity received by TA from TE.</p> <p>OK</p> <p>Parameters</p> <table> <tr> <td>&lt;format&gt;</td><td>1 8 data 0 parity 2 stop</td></tr> <tr> <td></td><td>2 8 data 1 parity 1 stop</td></tr> <tr> <td></td><td>3 8 data 0 parity 1 stop</td></tr> <tr> <td></td><td>4 7 data 0 parity 2 stop</td></tr> <tr> <td></td><td>5 7 data 1 parity 1 stop</td></tr> <tr> <td></td><td>6 7 data 0 parity 1 stop</td></tr> <tr> <td>&lt;parity&gt;</td><td>0 odd</td></tr> <tr> <td></td><td>1 even</td></tr> <tr> <td></td><td>3 space (0)</td></tr> </table> | <format> | 1 8 data 0 parity 2 stop |  | 2 8 data 1 parity 1 stop |  | 3 8 data 0 parity 1 stop |  | 4 7 data 0 parity 2 stop |  | 5 7 data 1 parity 1 stop |  | 6 7 data 0 parity 1 stop | <parity> | 0 odd |  | 1 even |  | 3 space (0) |
| <format>                                    | 1 8 data 0 parity 2 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 2 8 data 1 parity 1 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 3 8 data 0 parity 1 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 4 7 data 0 parity 2 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 5 7 data 1 parity 1 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 6 7 data 0 parity 1 stop  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| <parity>                                    | 0 odd   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 1 even  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
|   | 3 space (0)   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| Parameter Saving Mode                       | -   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| Max Response Time                           | -   |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |
| Reference V.25ter                           | <p>Note</p> <p>The Command is applied for Command state;</p> <p>In &lt;format&gt; parameter, "0 parity" means no parity;</p> <p>The &lt;parity&gt; field is ignored if the &lt;format&gt; field specifies no parity and string "+ICF: &lt;format&gt;,255" will be response to "AT+ICF?" Command.</p>  |          |                          |  |                          |  |                          |  |                          |  |                          |  |                          |          |       |  |        |  |             |

## 2.2.31 AT+IFC Set TE-TA Local Data Flow Control

### AT+IFC Set TE-TA Local Data Flow Control



|  |  |
|--|--|
| Test Command<br><b>AT+IFC=?</b>  | <p>Response</p> <p><b>+IFC:</b> (list of supported <b>&lt;dce_by_dte&gt;s</b>),(list of supported <b>&lt;dte_by_dce&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+IFC?</b>   | <p>Response</p> <p><b>+IFC:</b> <b>&lt;dce_by_dte&gt;</b>,<b>&lt;dte_by_dce&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+IFC=&lt;dce_by_dte&gt;[,&lt;dte_by_dce&gt;]</b> | <p>Response</p> <p>This parameter setting determines the data flow control on the serial interface for data mode.</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;dce_by_dte&gt;</b> Specifies the method will be used by TE at receive of data from TA</p> <p>0 No flow control<br/>1 Software flow control<br/>2 Hardware flow control</p> <p><b>&lt;dte_by_dce&gt;</b> Specifies the method will be used by TA at receive of data from TE</p> <p>0 No flow control<br/>1 Software flow control<br/>2 Hardware flow control</p> |
| Parameter Saving Mode  | -  |
| Max Response Time  | -  |
| Reference V.25ter  | Note   |

### 2.2.32 AT+IPR Set TE-TA Fixed Local Rate

| <b>AT+IPR Set TE-TA Fixed Local Rate</b> |  |
|--|--|
| Test Command<br><b>AT+IPR=?</b>          | <p>Response</p> <p><b>+IPR:</b> (list of supported auto detectable <b>&lt;rate&gt;s</b>),(list of supported fixed-only <b>&lt;rate&gt;s</b>)</p> |

|   |   |
|---|---|
|   | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Read Command<br><b>AT+IPR?</b>              | Response<br><b>+IPR: &lt;rate&gt;</b>   |
|   | <b>OK</b><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+IPR=&lt;rate&gt;</b> | Response<br>This parameter setting determines the data rate of the TA on the serial interface. The rate of Command takes effect following the issuance of any result code associated with the current Command line.                               |
|   | <b>OK</b><br>Parameters<br><b>&lt;rate&gt;</b> Baud rate per second<br>0<br>300<br>600<br>1200<br>2400<br>4800<br>9600<br>19200<br>38400<br>57600<br>115200<br>230400<br>921600<br>2000000<br>2900000<br>3000000<br>3200000<br>3686400<br>4000000 |
| Parameter Saving Mode                       | AUTO_SAVE   |
| Max Response Time                           | -   |
| Reference V.25ter                           | Note  |

## 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 (identical with +GSN) |
| AT+CSCS | Select TE character set  |
| AT+CIMI | Request international mobile subscriber identity                   |
| AT+CLCK | Facility lock  |
| AT+CMEE | Report mobile equipment error                                      |
| AT+COPS | Operator selection   |
| AT+CPAS | Phone activity status  |
| AT+CPIN | Enter PIN  |
| AT+CPWD | Change password  |
| AT+CRC  | Set cellular result codes for incoming call indication             |
| AT+CREG | Network registration   |
| AT+CRSM | Restricted SIM access  |
| AT+CSQ  | Signal quality report  |
| AT+CPOL | Preferred operator list  |
| AT+COPN | Read operator names  |
| AT+CFUN | Set phone functionality  |
| AT+CCLK | Clock  |
| AT+CSIM | Generic SIM access   |
| AT+CBC  | Battery charge   |
| AT+CUSD | Unstructured supplementary service data                            |
| AT+CNUM | Subscriber Number  |

### 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                                | Response |
| AT+CGMI=?                                   | OK       |
| Execution                                   | Response |

|                                     |  |
|-------------------------------------|--|
| Command<br><b>AT+CGMI</b>           | TA returns manufacturer identification text.<br><b>&lt;manufacturer&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;manufacturer&gt;</b> The ID of manufacturer |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.2 AT+CGMM Request Model Identification

| <b>AT+CGMM Request Model Identification</b> |  |
|---|--|
| Test Command<br><b>AT+CGMM=?</b>            | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CGMM</b>         | Response<br>TA returns product model identification text.<br><b>&lt;model&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;model&gt;</b> Product model identification text |
| Parameter Saving Mode                       | NO_SAVE  |
| Max Response Time                           | -  |
| Reference<br>3GPP TS 27.007<br>[13]         | Note   |

### 3.2.3 AT+CGMR Request TA Revision Identification of Software Release

| <b>AT+CGMR Request TA Revision Identification of Software Release</b> |   |
|---|---|
| Test Command<br><b>AT+CGMR=?</b>                                      | Response<br><b>OK</b>   |
| Execution Command<br><b>AT+CGMR</b>                                   | Response<br>TA returns product software version identification text.<br><b>Revision: &lt;revision&gt;</b> |

|                                     |  |
|-------------------------------------|--|
|                                     | <b>OK</b>  |
|                                     | Parameters<br><revision>      Product software version identification text |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.4 AT+CGSN Request Product Serial Number Identification

| AT+CGSN Request Product Serial Number Identification (Identical with +GSN) |  |
|--|--|
| Test Command<br><b>AT+CGSN=?</b>   | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CGSN</b>  | Response<br>see +GSN<br><sn><br><br><b>OK</b>                          |
|  | Parameters<br><sn>      International mobile equipment identity (IMEI) |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference<br>3GPP TS 27.007<br>[13]  | Note   |

### 3.2.5 AT+CSCS Select TE Character Set

| AT+CSCS Select TE Character Set  |   |
|----------------------------------|---|
| Test Command<br><b>AT+CSCS=?</b> | Response<br><b>+CSCS:</b> (list of supported <chset>s)<br><br><b>OK</b>   |
|                                  | Parameters<br><chset>      "GSM"    GSM 7 bit default alphabet (3GPP TS 23.038);<br>"UCS2"    16-bit universal multiple-octet coded character set<br>(ISO/IEC10646); UCS2 character strings are converted to<br>hexadecimal numbers from 0000 to FFFF; e.g. |

|   |  |
|---|--|
|   | <p>"004100620063" equals three 16-bit characters with decimal values 65, 98 and 99</p> <p><u>"IRA"</u> International reference alphabet (ITU-T T.50)</p>   |
| Read Command<br><b>AT+CSCS?</b>               | <p>Response</p> <p><b>+CSCS: &lt;chset&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Test Command</p>  |
| Write Command<br><b>AT+CSCS=&lt;chset&gt;</b> | <p>Response</p> <p>Sets which character set &lt;chset&gt; are used by the TE. The TA can then convert character strings correctly between the TE and ME character sets.</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>See Test Command</p> |
| Parameter Saving Mode                         | NO_SAVE  |
| Max Response Time                             | -  |
| Reference<br>3GPP TS 27.007<br>[13]           | Note   |

### 3.2.6 AT+CIMI Request International Mobile Subscriber Identity

| <b>AT+CIMI Request International Mobile Subscriber Identity</b> |   |
|---|---|
| Test Command<br><b>AT+CIMI=?</b>                                | <p>Response</p> <p><b>OK</b></p>  |
| Execution Command<br><b>AT+CIMI</b>                             | <p>Response</p> <p>TA returns &lt;IMSI&gt; for identifying the individual SIM which is attached to ME.</p> <p><b>&lt;IMSI&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;IMSI&gt;</b> International Mobile Subscriber Identity (string without double quotes)</p> |
| Parameter Saving Mode   | NO_SAVE   |

|                                     |      |
|-------------------------------------|------|
| Max Response Time                   | 20s  |
| Reference<br>3GPP TS 27.007<br>[13] | Note |

### 3.2.7 AT+CLCK Facility Lock

| AT+CLCK Facility Lock   |   |
|---|---|
| Test Command<br><b>AT+CLCK=?</b>  | Response<br><b>+CLCK:</b> (list of supported <fac>s)  |
|   | <b>OK</b>   |
| Write Command<br><b>AT+CLCK=&lt;fac&gt;<br/>,&lt;mode&gt;[,&lt;passw<br/>d&gt;[,&lt;class&gt;]]</b> | Parameters<br>See Write Command   |
|   | <p>Response</p> <p>This Command is used to lock, unlock or interrogate a ME or a network facility &lt;fac&gt;. Password is normally needed to do such actions. When querying the status of a network service (&lt;mode&gt;=2) the response line for 'not active' case (&lt;status&gt;=0) should be returned only if service is not active for any &lt;class&gt;.</p> <p>If &lt;mode&gt;≠2 and Command is successful<br/><b>OK</b></p> <p>If &lt;mode&gt;=2 and Command is successful<br/><b>+CLCK: &lt;status&gt;[,&lt;class1&gt;[&lt;CR&gt;&lt;LF&gt;+CLCK:<br/>&lt;status&gt;,&lt;class2&gt;[...]]</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;fac&gt;</b></p> <ul style="list-style-type: none"> <li>"AB" All Barring services(only for &lt;mode&gt;=0)</li> <li>"AC" All inComing barring services(only for &lt;mode&gt;=0)</li> <li>"AG" All outGoing barring services(only for &lt;mode&gt;=0)</li> <li>"AI" BAIC (Barr All Incoming Calls)</li> <li>"AO" BAO (Barr All Outgoing Calls)</li> <li>"IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country)</li> <li>"OI" BOIC (Barr Outgoing International Calls)</li> <li>"OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country)</li> </ul> |

|                                  |   |
|----------------------------------|---|
|                                  | <p>"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code.</p> <p>"FD" SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as &lt;passwd&gt;)</p> <p>"PN" Network Personalization, Correspond to NCK code</p> <p>"PU" Network subset Personalization Correspond to NSCK code</p> <p>"PP" Service Provider Personalization Correspond to SPCK code</p> <p>&lt;mode&gt;     0    unlock<br/>              1    lock<br/>              2    query status</p> <p>&lt;passwd&gt;    String type (Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD)</p> <p>&lt;class&gt;     1-255<br/>              1    Voice (telephony)<br/>              2    Data refers to all bearer services; with &lt;mode&gt;=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)<br/>              4    Fax (facsimile services)<br/>              7    All classes</p> <p>&lt;status&gt;    0    Not active<br/>              1    Active</p> |
| Parameter Saving Mode            | NO_SAVE   |
| Max Response Time                | 15s   |
| Reference<br>3GPP TS 27.007 [14] | <p>Note</p> <ul style="list-style-type: none"> <li>● CME errors if SIM not inserted or PIN is not entered.</li> </ul>   |

### 3.2.8 AT+CMEE Report Mobile Equipment Error

| AT+CMEE Report Mobile Equipment Error |   |
|---------------------------------------|---|
| Test Command<br>AT+CMEE=?             | <p>Response</p> <p>+CMEE: (list of supported &lt;n&gt;s)</p> <p><b>OK</b></p> |
|                                       | <p>Parameters</p> <p>See Write Command</p>                                    |



|  |  |
|--|--|
| Read Command<br><b>AT+CMEE?</b>                  | <p>Response</p> <p><b>+CMEE: &lt;n&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CMEE=[&lt;n&gt;<br/>]</b> | <p>Response</p> <p>TA disables or enables the use of result code <b>+CME ERROR: &lt;err&gt;</b> as an indication of an error relating to the functionality of the ME.</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b>     <b>0</b>     Disable <b>+CME ERROR: &lt;err&gt;</b> result code and use ERROR instead.</p> <p>          1     Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use numeric <b>&lt;err&gt;</b></p> <p>          2     Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use verbose <b>&lt;err&gt;</b> values</p> |
| Parameter Saving Mode                            | NO_SAVE  |
| Max Response Time                                | -  |
| Reference<br>3GPP TS 27.007<br>[13]              | Note   |

### 3.2.9 AT+COPS Operator Selection

| <b>AT+COPS Operator Selection</b> |   |
|-----------------------------------|---|
| Test Command<br><b>AT+COPS=?</b>  | <p>Response</p> <p>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><b>+COPS:</b> (list of supported&lt;stat&gt;,long alphanumeric&lt;oper&gt;,short alphanumeric&lt;oper&gt;,numeric &lt;oper&gt;,&lt;netact&gt;)s[,,(list of supported &lt;mode&gt;s),(list of supported &lt;format&gt;s)]</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> |

|  |  |
|--|--|
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+COPS?</b>  | Response<br>TA returns the current mode and the currently selected operator. If no operator is selected, <b>&lt;format&gt;</b> and <b>&lt;oper&gt;</b> are omitted.<br><b>+COPS: &lt;mode&gt;[,&lt;format&gt;,&lt;oper&gt;,&lt;netact&gt;]</b><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+COPS=&lt;mode&gt;[,&lt;format&gt;[,&lt;oper&gt;]]</b> | Response<br>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 (except <b>&lt;mode&gt;=4</b> ). The selected operator name format shall apply to further read commands ( <b>AT+COPS?</b> ).<br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;stat&gt;</b> 0   Unknown<br>1   Operator available<br>2   Operator current<br>3   Operator forbidden<br><b>&lt;oper&gt;</b> Refer to [27.007]<br>operator in format as per <b>&lt;format&gt;</b><br><b>&lt;mode&gt;</b> 0   Automatic mode; <b>&lt;oper&gt;</b> field is ignored<br>1   Manual ( <b>&lt;oper&gt;</b> field shall be present, and <b>&lt;Act&gt;</b> optionally)<br>2   manual deregister from network<br>3   set only <b>&lt;format&gt;</b> (for read Command <b>+COPS?</b> ) - not shown in Read Command response<br>4   Manual/automatic ( <b>&lt;oper&gt;</b> field shall be present); if manual selection fails, automatic mode ( <b>&lt;mode&gt;=0</b> ) is entered<br><b>&lt;format&gt;</b> 0   Long format alphanumeric <b>&lt;oper&gt;</b><br>1   Short format alphanumeric <b>&lt;oper&gt;</b><br>2   Numeric <b>&lt;oper&gt;</b> ; GSM Location Area Identification number<br><b>&lt;netact&gt;</b> 0   User-specified GSM access technology<br>1   GSM compact |

|                                     |   |
|-------------------------------------|---|
|                                     | 3 GSM EGPRS<br>7 User-specified LTE M1 A GB access technology<br>9 User-specified LTE NB S1 access technology |
| Parameter Saving Mode               | AUTO_SAVE   |
| Max Response Time                   | Test command: 45 seconds<br>Write command: 120 seconds  |
| Reference<br>3GPP TS 27.007<br>[14] | Note  |

### 3.2.10 AT+CPAS Phone Activity Status

| AT+CPAS Phone Activity Status       |  |
|-------------------------------------|--|
| Test Command<br><b>AT+CPAS=?</b>    | Response<br><b>+CPAS:</b> (list of supported <pas>s)<br><br><b>OK</b><br><br>Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+CPAS</b> | Response<br>TA returns the activity status of ME.<br><b>+CPAS:</b> <pas><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR:</b> <err><br><br>Parameters<br><pas>    0 Ready (MT allows commands from TA/TE)<br>3 Ringing (MT is ready for commands from TA/TE, but the<br>ger is active)<br>4 Call in progress (MT is ready for commands from TA/TE,<br>a call is in progress) |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.11 AT+CPIN Enter PIN

| AT+CPIN Enter PIN   |  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
|---|--|--------------------|------------------------------------|------------------------|--|---------|---------------------------------------|------------|---|------------|---------------------------------------|----------|--|----------|--|
| Test Command<br><b>AT+CPIN=?</b>                              | Response<br><b>OK</b>  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| Read Command<br><b>AT+CPIN?</b>                               | <p>Response</p> <p>TA returns an alphanumeric string indicating whether some password is required or not.</p> <p><b>+CPIN: &lt;code&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;code&gt;</b></p> <table> <tr> <td>READY</td><td>MT is not pending for any password</td></tr> <tr> <td>SIM PIN</td><td>MT is waiting SIM PIN to be given</td></tr> <tr> <td>SIM PUK</td><td>MT is waiting for SIM PUK to be given</td></tr> <tr> <td>PH_SIM PIN</td><td>ME is waiting for phone to SIM card (antitheft)</td></tr> <tr> <td>PH_SIM PUK</td><td>ME is waiting for SIM PUK (antitheft)</td></tr> <tr> <td>SIM PIN2</td><td>PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17</td></tr> <tr> <td>SIM PUK2</td><td>Possible only if preceding Command was acknowledged with error +CME ERROR: 18.</td></tr> </table> | READY              | MT is not pending for any password | SIM PIN                | MT is waiting SIM PIN to be given                                    | SIM PUK | MT is waiting for SIM PUK to be given | PH_SIM PIN | ME is waiting for phone to SIM card (antitheft) | PH_SIM PUK | ME is waiting for SIM PUK (antitheft) | SIM PIN2 | PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17 | SIM PUK2 | Possible only if preceding Command was acknowledged with error +CME ERROR: 18. |
| READY   | MT is not pending for any password   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| SIM PIN   | MT is waiting SIM PIN to be given  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| SIM PUK   | MT is waiting for SIM PUK to be given  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| PH_SIM PIN  | ME is waiting for phone to SIM card (antitheft)  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| PH_SIM PUK  | ME is waiting for SIM PUK (antitheft)  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| SIM PIN2  | PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| SIM PUK2  | Possible only if preceding Command was acknowledged with error +CME ERROR: 18.   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| Write Command<br><b>AT+CPIN=&lt;pin&gt;[,&lt;new pin&gt;]</b> | <p>Response</p> <p>TA stores a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.).</p> <p>If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin <b>&lt;new pin&gt;</b>, is used to replace the old pin in the SIM.</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <table> <tr> <td><b>&lt;pin&gt;</b></td><td>String type; password</td></tr> <tr> <td><b>&lt;new pin&gt;</b></td><td>String type; If the PIN required is SIM PUK or SIMPUK2: new password</td></tr> </table>  | <b>&lt;pin&gt;</b> | String type; password              | <b>&lt;new pin&gt;</b> | String type; If the PIN required is SIM PUK or SIMPUK2: new password |         |                                       |            |   |            |                                       |          |  |          |  |
| <b>&lt;pin&gt;</b>  | String type; password  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| <b>&lt;new pin&gt;</b>  | String type; If the PIN required is SIM PUK or SIMPUK2: new password   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| Parameter Saving Mode   | NO_SAVE  |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| Max Response Time   | 5s   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |
| Reference<br>3GPP TS 27.007 [13]                              | Note   |                    |                                    |                        |  |         |                                       |            |   |            |                                       |          |  |          |  |

### 3.2.12 AT+CPWD Change Password

| AT+CPWD Change Password   |  |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
|---|--|------|----------------------|------|--|------|--|------|--------------------------------|------|--------------------------------|------|--|------|--|------|--|------|---|------|----------|
| Test Command<br><b>AT+CPWD=?</b>  | <p>Response</p> <p>TA returns a list of pairs which present the available facilities and the maximum length of their password.</p> <p><b>+CPWD:</b> (list of supported &lt;fac&gt;s, list of supported &lt;pwdlength&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;fac&gt;                      See Write Command</p> <p>&lt;pwdlength&gt;              Integer max. length of password</p>  |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| Write Command<br><b>AT+CPWD=&lt;fac&gt;<br/>&gt;,&lt;oldpwd&gt;,&lt;new<br/>pwd&gt;</b> | <p>Response</p> <p>TA sets a new password for the facility lock function.</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;fac&gt;</p> <table border="0"> <tr><td>"AB"</td><td>All Barring services</td></tr> <tr><td>"AC"</td><td>All inComing barring services(only for &lt;mode&gt;=0)</td></tr> <tr><td>"AG"</td><td>All outGoing barring services(only for &lt;mode&gt;=0)</td></tr> <tr><td>"AI"</td><td>BAIC (Barr All Incoming Calls)</td></tr> <tr><td>"AO"</td><td>BAOC (Barr All Outgoing Calls)</td></tr> <tr><td>"IR"</td><td>BIC-Roam (Barr Incoming Calls when Roaming outside the home country)</td></tr> <tr><td>"OI"</td><td>BOIC (Barr Outgoing International Calls)</td></tr> <tr><td>"OX"</td><td>BOIC-exHC (Barr Outgoing International Calls except to Home Country)</td></tr> <tr><td>"SC"</td><td>SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code.</td></tr> <tr><td>"P2"</td><td>SIM PIN2</td></tr> </table> <p>&lt;oldpwd&gt;      String type (string should be included in quotation marks): password specified for the facility from the user interface or with command. If an old password has not yet been set,&lt;oldpwd&gt; is not to enter.</p> <p>&lt;newpwd&gt;      String type (string should be included in quotation marks): new password</p> | "AB" | All Barring services | "AC" | All inComing barring services(only for <mode>=0) | "AG" | All outGoing barring services(only for <mode>=0) | "AI" | BAIC (Barr All Incoming Calls) | "AO" | BAOC (Barr All Outgoing Calls) | "IR" | BIC-Roam (Barr Incoming Calls when Roaming outside the home country) | "OI" | BOIC (Barr Outgoing International Calls) | "OX" | BOIC-exHC (Barr Outgoing International Calls except to Home Country) | "SC" | SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code. | "P2" | SIM PIN2 |
| "AB"  | All Barring services   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "AC"  | All inComing barring services(only for <mode>=0)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "AG"  | All outGoing barring services(only for <mode>=0)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "AI"  | BAIC (Barr All Incoming Calls)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "AO"  | BAOC (Barr All Outgoing Calls)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "IR"  | BIC-Roam (Barr Incoming Calls when Roaming outside the home country)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "OI"  | BOIC (Barr Outgoing International Calls)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "OX"  | BOIC-exHC (Barr Outgoing International Calls except to Home Country)   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "SC"  | SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code.  |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| "P2"  | SIM PIN2   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| Parameter    Saving<br>Mode   | NO_SAVE  |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| Max        Response<br>Time   | 15s  |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |
| Reference<br>3GPP TS 27.007   | Note   |      |                      |      |  |      |  |      |                                |      |                                |      |  |      |  |      |  |      |   |      |          |

[13]

### 3.2.13 AT+CRC Set Cellular Result Codes for Incoming Call Indication

| AT+CRC Set Cellular Result Codes for Incoming Call Indication |   |
|---|---|
| Test Command<br><b>AT+CRC=?</b>                               | <p>Response</p> <p><b>+CRC:</b> (list of supported &lt;mode&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br><b>AT+CRC?</b>                                | <p>Response</p> <p><b>+CRC:</b> &lt;mode&gt;</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+CRC=[&lt;mode&gt;]</b>                 | <p>Response</p> <p>TA controls whether or not the extended format of incoming call indication is used.</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;mode&gt;     0    Disable extended format<br/>              1    Enable extended format<br/>              Omitted Use previous value</p> <p>Unsolicited Result Code</p> <p>When enabled, an incoming call is indicated to the TE with unsolicited result code <b>+CRING: &lt;type&gt;</b> instead of the normal <b>RING</b>.</p> <p>Parameters</p> <p>&lt;type&gt;       ASYNC       Asynchronous transparent<br/>              SYNC       Synchronous transparent<br/>              REL ASYNC    Asynchronous non-transparent<br/>              REL SYNC    Synchronous non-transparent<br/>              FAX       Facsimile<br/>              VOICE       Voice</p> |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference<br>3GPP TS 27.007<br>[13]                           | Note  |

### 3.2.14 AT+CREG Network Registration

| AT+CREG Network Registration                      |   |
|---|---|
| Test Command<br><b>AT+CREG=?</b>                  | Response<br><b>+CREG:</b> (list of supported <n>s)<br><br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CREG?</b>                   | Response<br>TA returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network.<br><b>+CREG:</b> <n>,<stat>[,<lac>,<ci>,<netact>]<br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR:</b> <err>   |
| Write Command<br><b>AT+CREG[=&lt;n&gt;]<br/>]</b> | Response<br>TA controls the presentation of an unsolicited result code <b>+CREG:</b> <stat> when <n>=1 and there is a change in the ME network registration status.<br><b>OK</b><br><br>Parameters<br><b>&lt;n&gt;</b><br><ul style="list-style-type: none"> <li><u>0</u> Disable network registration unsolicited result code</li> <li>1 Enable network registration unsolicited result code<br/><b>+CREG:</b> &lt;stat&gt;</li> <li>2 Enable network registration unsolicited result code with location information(2 is only for 7000 series module which support GPRS.)<br/><b>CREG:</b> &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;netact&gt;]</li> </ul> <b>&lt;stat&gt;</b> <ul style="list-style-type: none"> <li>0 Not registered, MT is not currently searching a new operator to register to</li> <li>1 Registered, home network</li> <li>2 Not registered, but MT is currently searching a new operator to register to</li> <li>3 Registration denied</li> <li>4 Unknown</li> <li>5 Registered, roaming</li> </ul> <b>&lt;lac&gt;</b> String type (string should be included in quotation marks); two byte location area code in hexadecimal format<br><br><b>&lt;ci&gt;</b> String type (string should be included in quotation marks); two byte cell ID in hexadecimal format |

|                                     |  |
|-------------------------------------|--|
|                                     | <p><b>&lt;netact&gt;</b></p> <ul style="list-style-type: none"> <li>0 User-specified GSM access technology</li> <li>1 GSM compact</li> <li>3 GSM EGPRS</li> <li>7 User-specified LTE M1 A GB access technology</li> <li>9 User-specified LTE NB S1 access technology</li> </ul> <p>Unsolicited Result Code</p> <p>If <b>&lt;n&gt;=1</b> and there is a change in the MT network registration status<br/> <b>+CREG: &lt;stat&gt;</b></p> <p>If <b>&lt;n&gt;=2</b> and there is a change in the MT network registration status or a change of the network cell:<br/> <b>+CREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;netact&gt;]</b></p> <p>Parameters<br/> See Write Command</p> |
| Parameter Saving Mode               | -  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.15 AT+CRSM Restricted SIM Access

| AT+CRSM Restricted SIM Access  |   |
|--|---|
| Test Command<br><b>AT+CRSM=?</b>   | Response<br><b>OK</b>   |
| Write Command<br><b>AT+CRSM=&lt;Command&gt;[,&lt;fileId&gt;[,&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;[,&lt;data&gt;]]]</b> | <p>Response</p> <p><b>+CRSM: &lt;sw1&gt;,&lt;sw2&gt;[,&lt;response&gt;]</b></p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>If error is related to ME functionality:<br/> <b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;Command&gt;</b></p> <ul style="list-style-type: none"> <li>176 READ BINARY</li> <li>178 READ RECORD</li> <li>192 GET RESPONSE</li> <li>214 UPDATE BINARY</li> <li>220 UPDATE RECORD</li> <li>242 STATUS</li> </ul> <p>All other values are reserved; refer GSM 11.11.</p> <p><b>&lt;fileId&gt;</b> Integer type; this is the identifier for an elementary data file on</p> |



|  |   |
|--|---|
|  | <p>SIM. Mandatory for every Command except STATUS</p> <p><b>&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;</b> Integer type, range 0 – 255</p> <p>Parameters to be passed on by the ME to the SIM; refer GSM 11.11.</p> <p><b>&lt;data&gt;</b> Information which shall be written to the SIM (hex-decimal character format)</p> <p><b>&lt;sw1&gt;,&lt;sw2&gt;</b> Integer type, range 0 - 255</p> <p>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.</p> <p><b>&lt;response&gt;</b> Response of a successful completion of the Command previously issued (hexadecimal character format)</p> |
| Parameter Saving Mode                    | NO_SAVE   |
| Max Response Time                        | -   |
| Reference<br>3GPP TS 27.007<br>GSM 11.11 | Note  |

### 3.2.16 AT+CSQ Signal Quality Report

| AT+CSQ Signal Quality Report |  |   |                  |   |          |        |                 |    |                    |
|------------------------------|--|---|------------------|---|----------|--------|-----------------|----|--------------------|
| Test Command<br>AT+CSQ=?     | <p>Response</p> <p><b>+CSQ:</b> (list of supported <b>&lt;rssi&gt;</b>s),(list of supported <b>&lt;ber&gt;</b>s)</p> <p><b>OK</b></p>  |   |                  |   |          |        |                 |    |                    |
| Execution Command<br>AT+CSQ  | <p>Response</p> <p><b>+CSQ:</b> <b>&lt;rssi&gt;</b>,<b>&lt;ber&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR:</b> <b>&lt;err&gt;</b></p> <p>Execution Command returns received signal strength indication <b>&lt;rssi&gt;</b> and channel bit error rate <b>&lt;ber&gt;</b> from the ME. Test Command returns values supported by the TA.</p> <p>Parameters</p> <p><b>&lt;rssi&gt;</b></p> <table> <tr> <td>0</td><td>-115 dBm or less</td></tr> <tr> <td>1</td><td>-111 dBm</td></tr> <tr> <td>2...30</td><td>-110... -54 dBm</td></tr> <tr> <td>31</td><td>-52 dBm or greater</td></tr> </table> | 0 | -115 dBm or less | 1 | -111 dBm | 2...30 | -110... -54 dBm | 31 | -52 dBm or greater |
| 0                            | -115 dBm or less   |   |                  |   |          |        |                 |    |                    |
| 1                            | -111 dBm   |   |                  |   |          |        |                 |    |                    |
| 2...30                       | -110... -54 dBm  |   |                  |   |          |        |                 |    |                    |
| 31                           | -52 dBm or greater   |   |                  |   |          |        |                 |    |                    |

|                                     |  |
|-------------------------------------|--|
|                                     | <p>99 not known or not detectable</p> <p><b>&lt;ber&gt;</b> (in percent):</p> <p>0...7 As RXQUAL values in the table in GSM 05.08 [20] subclause 7.2.4</p> <p>99 Not known or not detectable</p> |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.17 AT+CPOL Preferred Operator List

| AT+CPOL Preferred Operator List   |  |
|---|--|
| Test Command<br>AT+CPOL=?   | <p>Response</p> <p><b>+CPOL:</b> (list of supported <b>&lt;index&gt;s</b>),(list of supported <b>&lt;format&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br>AT+CPOL?  | <p>Response</p> <p><b>+CPOL:</b></p> <p><b>&lt;index1&gt;,&lt;format&gt;,&lt;oper1&gt;[,&lt;GSM&gt;,&lt;GSM_compact&gt;,&lt;UTRAN&gt;,&lt;E-UTRAN&gt;][&lt;CR&gt;&lt;LF&gt;+CPOL:</b></p> <p><b>&lt;index2&gt;,&lt;format&gt;,&lt;oper2&gt;[,&lt;GSM&gt;,&lt;GSM_compact&gt;,&lt;UTRAN&gt;,&lt;E-UTRAN&gt;][...]</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Write Command<br>AT+CPOL=<index>[,<format>[,<oper>[<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>]]] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;index&gt;</b> Integer type: order number of operator in SIM preferred operator list</p> <p><b>&lt;format&gt;</b> Indicates whether alphanumeric or numeric</p>  |

|                                     |   |
|-------------------------------------|---|
|                                     | <p>format used (see +COPS Command)</p> <p>0 Long format alphanumeric &lt;oper&gt;</p> <p>1 Short format alphanumeric &lt;oper&gt;</p> <p>2 Numeric &lt;oper&gt;</p> <p>&lt;oper&gt; String type(string should be included in quotation marks)</p> <p>&lt;GSM&gt; GSM access technology</p> <p>0 Access technology is not selected</p> <p>1 Access technology is selected</p> <p>&lt;GSM_compact&gt; GSM compact access technology</p> <p>0 Access technology is not selected</p> <p>1 Access technology is selected</p> <p>&lt;UTRAN&gt; UTRAN access technology</p> <p>0 Access technology is not selected</p> <p>1 Access technology is selected</p> <p>&lt;E-UTRAN&gt; E-UTRAN access technology</p> <p>0 Access technology is not selected</p> <p>1 Access technology is selected</p> |
| Parameter Saving Mode               | -   |
| Max Response Time                   | -   |
| Reference<br>3GPP TS 27.007<br>[13] | Note  |

### 3.2.18 AT+COPN Read Operator Names

| AT+COPN Read Operator Names  |  |
|------------------------------|--|
| Test Command<br>AT+COPN=?    | Response<br><b>OK</b>  |
| Execution Command<br>AT+COPN | <p>Response</p> <p>+COPN: &lt;numeric1&gt;,&lt;alpha1&gt;</p> <p>[&lt;CR&gt;&lt;LF&gt;+COPN: &lt;numeric2&gt;,&lt;alpha2&gt;</p> <p>[...]]</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;numeric&gt; String type (string should be included in quotation marks): operator in numeric format (see +COPS)</p> <p>&lt;alpha&gt; String type (string should be included in quotation marks): operator in long alphanumeric format (see +COPS)</p> |

|                               |         |
|-------------------------------|---------|
| Parameter Saving Mode         | NO_SAVE |
| Max Response Time             | -       |
| Reference 3GPP TS 27.007 [13] | Note    |

### 3.2.19 AT+CFUN Set Phone Functionality

| AT+CFUN Set Phone Functionality        |   |
|--|---|
| Test Command<br>AT+CFUN=?              | <p>Response</p> <p><b>+CFUN:</b> (list of supported &lt;fun&gt;s),(list of supported &lt;rst&gt;s)</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br>AT+CFUN?               | <p>Response</p> <p><b>+CFUN: &lt;fun&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT+CFUN=<fun>[,<rst>] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;fun&gt;</b></p> <ul style="list-style-type: none"> <li>0 Minimum functionality</li> <li><u>1</u> Full functionality (Default)</li> <li>4 Disable phone both transmit and receive RF circuits.</li> <li>5 Factory Test Mode</li> <li>6 Reset</li> <li>7 Offline Mode</li> </ul> <p><b>&lt;rst&gt;</b></p> <ul style="list-style-type: none"> <li><u>0</u> Do not Reset the MT before setting it to &lt;fun&gt; power level.</li> <li>1 Reset the MT before setting it to &lt;fun&gt; power level.</li> </ul> |

|                                  |   |
|----------------------------------|---|
| Parameter Saving Mode            | -   |
| Max Response Time                | 10s   |
| Reference<br>3GPP TS 27.007 [13] | <p>Note</p> <ul style="list-style-type: none"> <li>● The <b>&lt;fun&gt;</b> power level will be written to flash except minimum functionality.</li> <li>● <b>AT+CFUN=1,1</b> can be used to reset module purposely at minimum/full functionality mode.</li> <li>● Response string <b>"OK"</b> will be returned after module resets if baud rate is set to fixed baud rate.</li> </ul> |

### 3.2.20 AT+CCLK Clock

| AT+CCLK Clock  |  |
|--|--|
| Test Command<br><b>AT+CCLK=?</b>                       | <p>Response</p> <p><b>OK</b></p>   |
| Read Command<br><b>AT+CCLK?</b>                        | <p>Response</p> <p><b>+CCLK: &lt;time&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CCLK=&lt;time&gt;<br/>e&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;time&gt;</b> String type(string should be included in quotation marks) value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -47...+48). E.g. 6th of May 2010, 00:01:52 GMT+2 hours equals to "10/05/06,00:01:52+08".</p> |
| Parameter Saving Mode                                  | AUTO_SAVE  |
| Max Response Time                                      | -  |
| Reference<br>3GPP TS 27.007                            | <p>Note</p> <p>Only time zone is auto saved.</p>   |

[13]

### 3.2.21 AT+CSIM Generic SIM Access

| AT+CSIM Generic SIM Access                  |  |
|---|--|
| Test Command<br>AT+CSIM=?                   | Response<br><b>OK</b>  |
| Write Command<br>AT+CSIM=<length>,<Command> | Response<br><b>+CSIM: &lt;length&gt;,&lt;response&gt;</b><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|   | Parameters<br><b>&lt;length&gt;</b> Integer type: length of characters sent to the TE in <b>&lt;Command&gt;</b> or <b>&lt;response&gt;</b> (i.e. twice the number of octets in the raw data).<br><b>&lt;Command&gt;</b> String type (string should be included in quotation marks): hex format: GSM 11.11 SIM Command sent from the ME to the SIM.<br><b>&lt;response&gt;</b> String type(string should be included in quotation marks): hex format: GSM 11.11 response from SIM to <b>&lt;Command&gt;</b> . |
| Parameter Saving Mode                       | NO_SAVE  |
| Max Response Time                           | -  |
| Reference<br>3GPP TS 27.007<br>[13]         | Note   |

### 3.2.22 AT+CBC Battery Charge

| AT+CBC Battery Charge       |   |
|-----------------------------|---|
| Test Command<br>AT+CBC=?    | Response<br><b>+CBC: (list of supported &lt;bcs&gt;s),(list of supported &lt;bcl&gt;s),(&lt;voltage&gt;)</b><br><br><b>OK</b> |
|                             | Parameters<br>See Execution Command   |
| Execution Command<br>AT+CBC | Response<br><b>+CBC: &lt;bcs&gt;,&lt;bcl&gt;,&lt;voltage&gt;</b>  |

|                                     |  |
|-------------------------------------|--|
|                                     | <b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|                                     | Parameters<br><b>&lt;bc&gt;</b> Charge status<br>0 ME is not charging<br>1 ME is charging<br>2 Charging has finished<br><b>&lt;bcl&gt;</b> Battery connection level<br>1...100 battery has 1-100 percent of capacity remaining<br>vent<br><b>&lt;voltage&gt;</b> Battery voltage(mV) |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.23 AT+CUSD Unstructured Supplementary Service Data

| AT+CUSD Unstructured Supplementary Service Data |  |
|---|--|
| Test Command<br>AT+CUSD=?                       | Response<br><b>+CUSD: (list of supported &lt;n&gt;s)</b><br><br><b>OK</b><br>Parameters<br>See Write Command   |
| Read Command<br>AT+CUSD?                        | Response<br><b>+CUSD: &lt;n&gt;</b><br><br><b>OK</b><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CUSD=<n>,<str>,<dcs>        | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br>Parameters<br><b>&lt;n&gt;</b> A numeric parameter which indicates control of the unstructured supplementary service data |

|                       |   |
|-----------------------|---|
|                       | <p>0 disable the result code presentation in the TE</p> <p>1 enable the result code presentation in the TE</p> <p>2 cancel session (not applicable to read Command response)</p> <p>&lt;str&gt; String type (string should be included in quotation marks)</p> <p>USSD-string</p> <p>&lt;dc&gt; Cell Broadcast Data Coding Scheme in integer format (default 0)</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |
| GSM 03.38 [25]        | When ussd is not support or return error,TE will print +CUSD:4.   |

### 3.2.24 AT+CNUM Subscriber Number

| AT+CNUM Subscriber Number    |  |
|------------------------------|--|
| Test Command<br>AT+CNUM=?    | Response<br>OK   |
| Execution Command<br>AT+CNUM | <p>Response</p> <p>+CNUM: "",&lt;number1&gt;,&lt;type1&gt;</p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;numberx&gt; String type (string should be included in quotation marks)</p> <p>phone number of format specified by &lt;typex&gt;</p> <p>&lt;typex&gt; Type of address octet in integer format (refer GSM04.08[8] subclause 10.5.4.7)</p> |
| Parameter Saving Mode        | NO_SAVE  |
| Max Response Time            | -  |
| Reference                    | Note   |
| 3GPP TS 27.007 [13]          |  |



## 4 AT Commands According to 3GPP TS 27.005

The 3GPP TS 27.005 commands are for performing SMS and CBS related operations. SIM7000 Series supports both Text and PDU modes.

### 4.1 Overview of AT Commands According to 3GPP TS 27.005

| Command | Description                            |
|---------|--|
| AT+CMGD | Delete SMS message                     |
| AT+CMGF | Select SMS message format              |
| AT+CMGL | List SMS messages from preferred store |
| AT+CMGR | Read SMS message                       |
| AT+CMGS | Send SMS message                       |
| AT+CMGW | Write SMS message to memory            |
| AT+CMSS | Send SMS message from storage          |
| AT+CNMI | New SMS message indications            |
| AT+CPMS | Preferred SMS message storage          |
| AT+CRES | Restore SMS settings                   |
| AT+CSAS | Save SMS settings                      |
| AT+CSCA | SMS service center address             |
| AT+CSDH | Show SMS text mode parameters          |
| AT+CSMP | Set SMS text mode parameters           |
| AT+CSMS | Select message service                 |

### 4.2 Detailed Descriptions of AT Commands According to 3GPP TS 27.005

#### 4.2.1 AT+CMGD Delete SMS Message

| AT+CMGD Delete SMS Message                   |  |
|--|--|
| Test Command<br>AT+CMGD=?                    | Response<br>+CMGD: (list of supported <index>s),(list of supported <delflag>s)<br><br>OK |
| Write Command<br>AT+CMGD=<index>[,<delflag>] | Parameters<br>See Write Command  |
| Write Command<br>AT+CMGD=<index>[,<delflag>] | Response<br>TA deletes message from preferred message storage <mem1> location <index>.   |

|                          |  |
|--------------------------|--|
|                          | <b>OK</b><br><b>ERROR</b><br>If error is related to ME functionality:<br><b>+CMS ERROR: &lt;err&gt;</b>  |
|                          | Parameters<br><b>&lt;index&gt;</b> Integer type; value in the range of location numbers supported by the associated memory<br><b>&lt;delflag&gt;</b> <ul style="list-style-type: none"> <li>0 Delete the message specified in <b>&lt;index&gt;</b></li> <li>1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched</li> <li>2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched</li> <li>3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched</li> <li>4 Delete all messages from preferred message storage including unread messages</li> </ul> |
| Parameter Saving Mode    | NO_SAVE  |
| Max Response Time        | 5s (delete 1 message)<br>25s (delete 50 messages)<br>25s (delete 150 messages)   |
| Reference 3GPP TS 27.005 | Note   |

#### 4.2.2 AT+CMGF Select SMS Message Format

| AT+CMGF Select SMS Message Format |  |
|-----------------------------------|--|
| Test Command<br><b>AT+CMGF=?</b>  | Response<br><b>+CMGF: (list of supported &lt;mode&gt;s)</b><br><br><b>OK</b> |
|                                   | Parameter<br>See Write Command   |
| Read Command<br><b>AT+CMGF?</b>   | Response<br><b>+CMGF: &lt;mode&gt;</b><br><br><b>OK</b>                      |
|                                   | Parameter<br>See Write Command   |

|  |   |
|--|---|
| Write Command<br><b>AT+CMGF=[&lt;mode&gt;]</b> | Response<br>TA sets parameter to denote which input and output format of messages to use.<br><b>OK</b><br><br>Parameter<br><b>&lt;mode&gt;</b> <u>0</u> PDU mode<br>1   Text mode |
| Parameter Saving Mode                          | -   |
| Max Response Time                              | -   |
| Reference<br>3GPP TS 27.005                    | Note  |

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

| AT+CMGL List SMS Messages from Preferred Store              |   |
|---|---|
| Test Command<br><b>AT+CMGL=?</b>                            | Response<br><b>+CMGL:</b> (list of supported <b>&lt;stat&gt;s</b> )<br><br><b>OK</b><br><br>Parameter<br>See Write Command  |
| Write Command<br><b>AT+CMGL=&lt;stat&gt;[,&lt;mode&gt;]</b> | Parameters<br>1) If text mode:<br><b>&lt;stat&gt;</b> <u>"REC UNREAD"</u> Received unread messages<br>"REC READ"       Received read messages<br>"STO UNSENT"   Stored unsent messages<br>"STO SENT"       Stored sent messages<br>"ALL"               All messages<br><br><b>&lt;mode&gt;</b> <u>0</u> Normal<br>1   Not change status of the specified SMS record<br>2) If PDU mode:<br><b>&lt;stat&gt;</b> <u>0</u> Received unread messages<br>1   Received read messages<br>2   Stored unsent messages<br>3   Stored sent messages<br>4   All messages<br><br><b>&lt;mode&gt;</b> <u>0</u> Normal<br>1   Not change status of the specified SMS record<br><br>Response<br>TA returns messages with status value <b>&lt;stat&gt;</b> from message storage <b>&lt;mem1&gt;</b> to the TE. If status of the message is 'received unread', status in |

the storage changes to 'received read'.

1) If text mode (+CMGF=1) and Command successful:

for SMS-SUBMITs and/or SMS-DELIVERs:

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

for SMS-STATUS-REPORTs:

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

for SMS-COMMANDs:

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

for CBM storage:

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

OK

2) If PDU mode (+CMGF=0) and Command successful:

```
+CMGL: <index>,<stat>[,<alpha>],<length>
<CR><LF><pdu><CR><LF>
+CMGL: <index>,<stat>[,<alpha>],<length>
<CR><LF><pdu>[...]]
```

OK

3) If error is related to ME functionality:

```
+CMS ERROR: <err>
```

Parameters

**<alpha>** String type(string should be included in quotation marks) alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with Command Select TE Character Set +CSCS (see definition of this Command in 3GPP TS 27.007)

**<da>** GSM 03.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer

Command +CSCS in 3GPP TS 27.007); type of address given by **<toaa>**

**<data>** In the case of SMS: GSM 03.40 TP-User-Data in text mode responses; format:

- if **<dc>** indicates that GSM 03.38 default alphabet is used and **<fo>** indicates that GSM 03.40 TPUser-Data-Header-Indication is not set:
- if TE character set other than "HEX" (refer Command Select TE Character Set +CSCS in 3GPP TS 27.007):ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character P (GSM 23) is presented as 17 (IRA 49 and 55))
- if **<dc>** indicates that 8-bit or UCS2 data coding scheme is used, or **<fo>** indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:
- if **<dc>** indicates that GSM 03.38 default alphabet is used:
- if TE character set other than "HEX" (refer Command +CSCS in 3GPP TS 27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number
- if **<dc>** indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

**<length>** Integer type value indicating in the text mode (+CMGF=1) the length of the message body **<data>** (or **<cdata>**) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

**<index>** Integer type; value in the range of location numbers supported by the associated memory

**<oa>** GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer Command +CSCS in 3GPP TS 27.007); type of address given by **<toaa>**

**<pdu>** In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet

|                                     |   |
|-------------------------------------|---|
|                                     | <p>with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.</p> <p><b>&lt;scts&gt;</b> GSM 03.40 TP-Service-Center-Time-Stamp in time-string format (refer <b>&lt;dt&gt;</b>)</p> <p><b>&lt;toda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)</p> <p><b>&lt;tooa&gt;</b> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <b>&lt;toda&gt;</b>)</p> |
| Execution Command<br><b>AT+CMGL</b> | <p>1) If text mode:<br/>the same as <b>AT+CMGL="REC UNREAD"</b>, received unread messages</p> <p>2) If PDU mode:<br/>the same as <b>AT+CMGL=0</b>, received unread messages</p> <p>See more messages please refer to Write Command.</p> <p>Parameters<br/>See Write Command</p>   |
| Parameter Saving Mode               | NO_SAVE   |
| Max Response Time                   | 20s(list 50 messages)<br>20s(list 150 messages)   |
| Reference                           | Note<br>3GPP TS 27.005  |

#### 4.2.4 AT+CMGR Read SMS Message

| AT+CMGR Read SMS Message                                     |   |
|--|---|
| Test Command<br><b>AT+CMGR=?</b>                             | Response<br><b>OK</b>   |
| Write Command<br><b>AT+CMGR=&lt;index&gt;[,&lt;mode&gt;]</b> | <p>Parameters</p> <p><b>&lt;index&gt;</b> Integer type; value in the range of location numbers supported by the associated memory</p> <p><b>&lt;mode&gt;</b> <u>0</u> Normal<br/>1 Not change status of the specified SMS record</p> <p>Response</p> <p>TA returns SMS message with location value <b>&lt;index&gt;</b> from message storage <b>&lt;mem1&gt;</b> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read'.</p> <p>1) If text mode (<b>+CMGF=1</b>) and Command successful:<br/>for SMS-DELIVER:<br/><b>+CMGR: &lt;stat&gt;,&lt;oa&gt;[,&lt;alpha&gt;],&lt;scts&gt;[,&lt;tooa&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcs&gt;,&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt;]&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</b></p> |

for SMS-SUBMIT:

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

for SMS-STATUS-REPORTs:

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

for SMS-COMMANDs:

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

for CBM storage:

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

2) If PDU mode (+CMGF=0) and Command successful:

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

**OK**

3) If error is related to ME functionality:

+CMS ERROR: <err>

Parameters

<alpha> String type (string should be included in quotation marks)  
alphanumeric representation of <da> or <oa> corresponding to the entry  
found in MT phonebook; implementation of this feature is manufacturer  
specific

<da> GSM 03.40 TP-Destination-Address Address-Value field in  
string format; BCD numbers (or GSM default alphabet characters) are  
converted to characters of the currently selected TE character set (specified  
by +CSCS in 3GPP TS 27.007); type of address given by <toda>

<data> In the case of SMS: GSM 03.40 TP-User-Data in text mode  
responses; format:

- if <dcs> indicates that GSM 03.38 default alphabet is used and  
<fo> indicates that GSM 03.40 TPUser-Data-Header-Indication  
is not set:
- if TE character set other than "HEX" (refer Command Select  
TE Character Set +CSCS in 3GPP TS 27.007):ME/TA converts  
GSM alphabet into current TE character set according to rules  
of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit  
character of GSM alphabet into two IRA character long  
hexadecimal number (e.g. character P (GSM 23) is presented as  
17 (IRA 49 and 55))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is  
used, or <fo> indicates that GSM 03.40  
TP-User-Data-Header-Indication is set: ME/TA converts each

8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:

- if **<dc>** indicates that GSM 03.38 default alphabet is used:
- if TE character set other than "HEX" (refer Command +CSCS in 3GPP TS 27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number
- if **<dc>** indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

**<dc>** Depending on the Command or result code: GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

**<fo>** Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format

**<length>** integer type value indicating in the text mode (+CMGF=1) the length of the message body **<data>** (or **<cdata>**) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)

**<mid>** GSM 03.41 CBM Message Identifier in integer format

**<oa>** GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted characters of the currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by **<tooa>**

**<pdu>** In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

**<pid>** GSM 03.40 TP-Protocol-Identifier in integer format (default 0)

**<sca>** GSM 04.11 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by **<tosca>**

**<scts>** GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer **<dt>**)

**<stat>** 0 "REC UNREAD" Received unread messages



|                       |  |
|-----------------------|--|
|                       | 1 "REC READ" Received read messages<br>2 "STO UNSENT" Stored unsent messages<br>3 "STO SENT" Stored sent messages<br>4 "ALL" All messages<br><br><b>&lt;toda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)<br><b>&lt;tooa&gt;</b> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <b>&lt;toda&gt;</b> )<br><b>&lt;tosca&gt;</b> GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <b>&lt;toda&gt;</b> )<br><b>&lt;vp&gt;</b> Depending on SMS-SUBMIT <b>&lt;fo&gt;</b> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <b>&lt;dt&gt;</b> ) |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | 5s   |
| Reference             | Note   |
| 3GPP TS 27.005        |  |

#### 4.2.5 AT+CMGS Send SMS Message

| AT+CMGS Send SMS Message   |  |
|--|--|
| Test Command<br><b>AT+CMGS=?</b>   | Response<br><b>OK</b>  |
| Write Command<br>1) If text mode (+CMGF=1):<br><b>+CMGS=&lt;da&gt;[, &lt;toda&gt;]</b><br><b>&lt;CR&gt;text is entered &lt;ctrl-Z/ESC&gt;</b><br>ESC quits without sending<br>2) If PDU mode (+CMGF=0):<br><b>+CMGS=&lt;length&gt;</b><br><b>&gt;</b><br><b>&lt;CR&gt;PDU is given</b> | Parameters<br><b>&lt;da&gt;</b> GSM 03.40 TP-Destination-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by <b>+CSCS</b> in 3GPP TS 27.007); type of address given by <b>&lt;toda&gt;</b><br><b>&lt;toda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)<br><b>&lt;length&gt;</b> Integer type value (not exceed 160 bytes) indicating in the text mode (+CMGF=1) the length of the message body <b>&lt;data&gt;</b> (or <b>&lt;cdata&gt;</b> ) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)<br><br>Response<br>TA sends message from a TE to the network (SMS-SUBMIT). Message reference value <b>&lt;mr&gt;</b> is returned to the TE on successful message delivery. |

|                       |   |
|-----------------------|---|
| <ctrl-Z/ESC>          | <p>Optionally (when +CSMS &lt;service&gt; value is 1 and network supports) &lt;scs&gt; is returned. Values can be used to identify message upon unsolicited delivery status report result code.</p> <p>1) If text mode(+CMGF=1) and sending successful:<br/>+CMGS: &lt;mr&gt;</p> <p><b>OK</b></p> <p>2) If PDU mode(+CMGF=0) and sending successful:<br/>+CMGS: &lt;mr&gt;</p> <p><b>OK</b></p> <p>3) If error is related to ME functionality:<br/>+CMS ERROR: &lt;err&gt;</p> |
|                       | <p>Parameter</p> <p>&lt;mr&gt; GSM 03.40 TP-Message-Reference in integer format</p>   |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | 60s   |
| Reference             | Note  |
| 3GPP TS 27.005        | <ul style="list-style-type: none"> <li>Reject incoming call when sending messages.</li> </ul>   |

#### 4.2.6 AT+CMGW Write SMS Message to Memory

| AT+CMGW Write SMS Message to Memory  |  |
|--|--|
| Test Command   | Response   |
| AT+CMGW=?  | <b>OK</b>  |
| Write Command  | Response   |
| 1) If text mode (+CMGF=1):<br>AT+CMGW=<oa>[,<tooa/toda>][,<stat>]<br><CR> text is entered<br><ctrl-Z/ESC><br><ESC> quits without sending | <p>TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage &lt;mem2&gt;. Memory location &lt;index&gt; of the stored message is returned. By default message status will be set to 'stored unsend', but parameter &lt;stat&gt; allows also other status values to be given.</p> <p>If writing is successful:<br/>+CMGW: &lt;index&gt;</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/>+CMS ERROR: &lt;err&gt;</p> |
| 2) If PDU mode (+CMGF=0):<br>AT+CMGW=<length>[,<stat>]   | <p>Parameters</p> <p>&lt;oa&gt; GSM 03.40 TP-Originating-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the</p>   |

|  |   |
|--|---|
| <p><b>&lt;CR&gt;PDU is given</b><br/><b>&lt;ctrl-Z/ESC&gt;</b></p> | <p>currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by <b>&lt;tooa&gt;</b></p> <p><b>&lt;da&gt;</b> GSM 03.40 TP-Destination-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by <b>&lt;toda&gt;</b></p> <p><b>&lt;tooa&gt;</b> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <b>&lt;toda&gt;</b>)</p> <p><b>&lt;toda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of <b>&lt;da&gt;</b> is + (IRA 43) default is 145, otherwise default is 129)</p> <p>129 Unknown type(ISDN format number)<br/>161 National number type(ISDN format)<br/>145 International number type(ISDN format)<br/>177 Network specific number(ISDN format)</p> <p><b>&lt;length&gt;</b> Integer type value (not exceed 160 bytes) indicating in the text mode (+CMGF=1) the length of the message body <b>&lt;data&gt;</b> (or <b>&lt;cdata&gt;</b>) in characters;<br/>or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)</p> <p><b>&lt;stat&gt;</b> in the text mode (+CMGF=1):<br/>"STO UNSENT" Stored unsent messages<br/>"STO SENT" Stored sent messages<br/>in PDU mode (+CMGF=0):<br/>0 Received unread messages<br/>1 Received read messages<br/>2 Stored unsent messages<br/>3 Stored sent messages</p> <p><b>&lt;pdu&gt;</b> In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.</p> <p><b>&lt;index&gt;</b> Index of message in selected storage <b>&lt;mem2&gt;</b></p> |
| <p>Execution Command<br/><b>AT+CMGW</b></p>                        | <p>Response</p> <p>TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage <b>&lt;mem2&gt;</b>. Memory location <b>&lt;index&gt;</b> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <b>&lt;stat&gt;</b> allows also other status values to be given.</p> <p>If writing is successful:<br/><b>+CMGW: &lt;index&gt;</b></p>   |

|                       |   |
|-----------------------|---|
|                       | <b>OK</b><br>If error is related to ME functionality:<br><b>+CMS ERROR: &lt;err&gt;</b> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | 5s  |
| Reference             | Note  |
| 3GPP TS 27.005        |   |

#### 4.2.7 AT+CMSS Send SMS Message from Storage

| AT+CMSS Send SMS Message from Storage                                 |   |
|---|---|
| Test Command<br><b>AT+CMSS=?</b>                                      | Response<br><b>OK</b>   |
| Write Command<br><b>AT+CMSS=&lt;index&gt;,&lt;da&gt;,&lt;tda&gt;]</b> | <p>Response</p> <p>TA sends message with location value &lt;index&gt; from message storage &lt;mem2&gt; to the network (SMS-SUBMIT). If new recipient address &lt;da&gt; is given, it shall be used instead of the one stored with the message. Reference value &lt;mr&gt; is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code.</p> <p>1) If text mode(+CMGF=1) and sending successful:<br/><b>+CMSS: &lt;mr&gt;</b></p> <p><b>OK</b></p> <p>2) If PDU mode(+CMGF=0) and sending successful:<br/><b>+CMSS: &lt;mr&gt;</b></p> <p><b>OK</b></p> <p>3) If error is related to ME functionality:<br/><b>+CMS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;index&gt;</b> Integer type; value in the range of location numbers supported by the associated memory</p> <p><b>&lt;da&gt;</b> GSM 03.40 TP-Destination-Address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by &lt;tda&gt;</p> <p><b>&lt;tda&gt;</b> GSM 04.11 TP-Destination-Address Type-of-Address octet in integer format (when first character of &lt;da&gt; is + (IRA 43) default is 145,</p> |

|                          |  |
|--------------------------|--|
|                          | otherwise default is 129)<br><mr> GSM 03.40 TP-Message-Reference in integer format |
| Parameter Saving Mode    | NO_SAVE  |
| Max Response Time        | 60s  |
| Reference 3GPP TS 27.005 | Note   |

#### 4.2.8 AT+CNMI New SMS Message Indications

| AT+CNMI New SMS Message Indications                          |   |
|--|---|
| Test Command<br>AT+CNMI=?                                    | <p>Response</p> <p>+CNMI: (list of supported &lt;mode&gt;s),(list of supported &lt;mt&gt;s),(list of supported &lt;bm&gt;s),(list of supported &lt;ds&gt;s),(list of supported &lt;bfr&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br>AT+CNMI?                                     | <p>Response</p> <p>+CNMI: &lt;mode&gt;,&lt;mt&gt;,&lt;bm&gt;,&lt;ds&gt;,&lt;bfr&gt;</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]] | <p>Response</p> <p>TA selects the procedure for how the receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in GSM 03.38.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;mode&gt; 0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.</p> <p>1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.</p> <p>2 Buffer unsolicited result codes in the TA when TA-TE</p> |

link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

**<mt>** (the rules for storing received SMS depend on its data coding scheme (refer GSM 03.38 [2]), preferred memory storage (+CPMS) setting and this value):

0 No SMS-DELIVER indications are routed to the TE.

1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:  
+CMTI: <mem>,<index>

2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code:

+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled)

or

+CMT:

<oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length> <CR><LF><data> (text mode enabled; about parameters in italics, refer Command Show Text Mode Parameters +CSDH). Class 2 messages result in indication as defined in <mt>=1.

3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other classes result in indication as defined in <mt>=1.

**<bm>** (the rules for storing received CBMs depend on its data coding scheme (refer GSM 03.38 [2]), the setting of Select CBM Types (+CSCB) and this value):

0 No CBM indications are routed to the TE.

2 New CBMs are routed directly to the TE using unsolicited result code:

+CBM: <length><CR><LF><pdu> (PDU mode enabled)

or

+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled).

**<ds>** 0 No SMS-STATUS-REPORTs are routed to the TE.

1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:

+CDS: <length><CR><LF><pdu> (PDU mode enabled)

or

+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<dt>,<st> (text mode enabled)

2 If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem3>,<index>

**<bfr>** 0 TA buffer of unsolicited result codes defined within this Command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes).

1 TA buffer of unsolicited result codes defined within this

|                             |  |
|-----------------------------|--|
|                             | <p>command is cleared when <b>&lt;mode&gt;</b> 1...3 is entered</p> <p>Unsolicited result code</p> <p>1. Indicates that new message has been received</p> <p>If <b>&lt;mt&gt;</b>=1:</p> <p><b>+CMTI:</b> <b>&lt;mem3&gt;</b>,<b>&lt;index&gt;</b></p> <p>If <b>&lt;mt&gt;</b>=2 (PDU mode enabled):</p> <p><b>+CMT:</b> [<b>&lt;alpha&gt;</b>],<b>&lt;length&gt;</b><b>&lt;CR&gt;</b><b>&lt;LF&gt;</b><b>&lt;pdu&gt;</b></p> <p>If <b>&lt;mt&gt;</b>=2 (text mode enabled):</p> <p><b>+CMT:</b></p> <p><b>&lt;oa&gt;</b>,<b>&lt;scts&gt;</b>[<b>&lt;tooa&gt;</b>,<b>&lt;fo&gt;</b>,<b>&lt;pid&gt;</b>,<b>&lt;dcs&gt;</b>,<b>&lt;sca&gt;</b>,<b>&lt;tosca&gt;</b>,<b>&lt;length&gt;</b>]<b>&lt;CR&gt;</b><b>&lt;LF&gt;</b><b>&lt;data&gt;</b></p> <p>2. Indicates that new cell broadcast message has been received</p> <p>If <b>&lt;bm&gt;</b>=2 (PDU mode enabled):</p> <p><b>+CBM:</b> <b>&lt;length&gt;</b><b>&lt;CR&gt;</b><b>&lt;LF&gt;</b><b>&lt;pdu&gt;</b></p> <p>If <b>&lt;bm&gt;</b>=2 (text mode enabled):</p> <p><b>+CBM:</b> <b>&lt;sn&gt;</b>,<b>&lt;mid&gt;</b>,<b>&lt;dcs&gt;</b>,<b>&lt;page&gt;</b>,<b>&lt;pages&gt;</b><b>&lt;CR&gt;</b><b>&lt;LF&gt;</b><b>&lt;data&gt;</b></p> <p>3. Indicates that new SMS status report has been received</p> <p>If <b>&lt;ds&gt;</b>=1 (PDU mode enabled):</p> <p><b>+CDS:</b> <b>&lt;length&gt;</b><b>&lt;CR&gt;</b><b>&lt;LF&gt;</b><b>&lt;pdu&gt;</b></p> <p>If <b>&lt;ds&gt;</b>=1 (text mode enabled):</p> <p><b>+CDS:</b> <b>&lt;fo&gt;</b>,<b>&lt;mr&gt;</b>[<b>&lt;ra&gt;</b>][<b>&lt;tora&gt;</b>],<b>&lt;scts&gt;</b>,<b>&lt;dt&gt;</b>,<b>&lt;st&gt;</b></p> |
| Parameter Saving Mode       | -  |
| Max Response Time           | -  |
| Reference<br>3GPP TS 27.005 | <p>Note</p> <ul style="list-style-type: none"> <li>This command is used to select the procedure how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF). If set <b>&lt;mt&gt;</b>=2,<b>&lt;mt&gt;</b>=3 or <b>&lt;ds&gt;</b>=1, make sure <b>&lt;mode&gt;</b>=1, otherwise it will return error..</li> </ul>  |

#### 4.2.9 AT+CPMS Preferred SMS Message Storage

| AT+CPMS Preferred SMS Message Storage |  |
|---------------------------------------|--|
| Test Command<br>AT+CPMS=?             | <p>Response</p> <p><b>+CPMS:</b> (list of supported <b>&lt;mem1&gt;</b>s),(list of supported <b>&lt;mem2&gt;</b>s),(list of supported <b>&lt;mem3&gt;</b>s)</p> <p><b>OK</b></p> <p>Parameters</p> |

|  |  |
|--|--|
|  | See Write Command  |
| Read Command<br><b>AT+CPMS?</b>  | <p>Response</p> <p>+CPMS: &lt;mem1&gt;,&lt;used1&gt;,&lt;total1&gt;,&lt;mem2&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;mem3&gt;,&lt;used3&gt;,&lt;total3&gt;</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CPMS=&lt;mem1&gt;[,&lt;mem2&gt;[,&lt;mem3&gt;]]</b> | <p>Response</p> <p>TA selects memory storages &lt;mem1&gt;,&lt;mem2&gt; and &lt;mem3&gt; to be used for reading, writing, etc.</p> <p>+CPMS: &lt;used1&gt;,&lt;total1&gt;,&lt;used2&gt;,&lt;total2&gt;,&lt;used3&gt;,&lt;total3&gt;</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;mem1&gt; Messages to be read and deleted from this memory storage<br/>"SM" SIM message storage</p> <p>&lt;mem2&gt; Messages will be written and sent to this memory storage<br/>"SM" SIM message storage</p> <p>&lt;mem3&gt; Received messages will be placed in this memory storage if routing to PC is not set (" +CNMI")<br/>"SM" SIM message storage</p> <p>&lt;usedx&gt; Integer type; Number of messages currently in &lt;memx&gt;</p> <p>&lt;totalx&gt; Integer type; Number of messages storable in &lt;memx&gt;</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference<br>3GPP TS 27.005  | Note   |

#### 4.2.10 AT+CRES Restore SMS Settings

| AT+CRES Restore SMS Settings     |   |
|----------------------------------|---|
| Test Command<br><b>AT+CRES=?</b> | <p>Response</p> <p>+CRES: list of supported &lt;profile&gt;s</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p> |
| Write Command                    | Response  |



|  |   |
|--|---|
| <b>AT+CRES=&lt;profile&gt;</b>                 | <p>Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA and Set Message Parameters +CSMP are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> |
|  | <p>Parameter</p> <p><b>&lt;profile&gt;</b>      0    Restore SM service settings from profile 0</p>   |
| <p>Execution Command</p> <p><b>AT+CRES</b></p> | <p>Response</p> <p>Same as <b>AT+CRES=0</b>.</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CMS ERROR &lt;err&gt;</b></p>  |
| <p>Parameter Saving Mode</p>                   | <p>NO_SAVE</p>  |
| <p>Max Response Time</p>                       | <p>5s</p>   |
| <p>Reference</p> <p>3GPP TS 27.005</p>         | <p>Note</p>   |

#### 4.2.11 AT+CSAS Save SMS Settings

| AT+CSAS Save SMS Settings                                  |   |
|--|---|
| <p>Test Command</p> <p><b>AT+CSAS=?</b></p>                | <p>Response</p> <p><b>+CSAS:</b> list of supported <b>&lt;profile&gt;</b>s</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>   |
| <p>Write Command</p> <p><b>AT+CSAS=&lt;profile&gt;</b></p> | <p>Response</p> <p>Execution command saves active message service settings to a non-volatile memory. Settings specified in commands Service Centre Address +CSCA and Set Message Parameters +CSMP are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameter</p> <p><b>&lt;profile&gt;</b>      0    Save SM service setting in profile 0</p> |
| <p>Execution Command</p>                                   | <p>Response</p> <p>Same as <b>AT+CSAS=0</b></p>   |

|                       |  |
|-----------------------|--|
| AT+CSAS               | <b>OK</b><br><br>If error is related to ME functionality:<br><b>+CMS ERROR &lt;err&gt;</b> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | 5s   |
| Reference             | Note   |
| 3GPP TS 27.005        |  |

#### 4.2.12 AT+CSCA SMS Service Center Address

| AT+CSCA SMS Service Center Address                          |  |
|---|--|
| Test Command<br><b>AT+CSCA=?</b>                            | Response<br><b>OK</b>  |
| Read Command<br><b>AT+CSCA?</b>                             | Response<br><b>+CSCA: &lt;sca&gt;,&lt;tosca&gt;[,&lt;scaAlpha&gt;]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSCA=&lt;sca&gt;[,&lt;tosca&gt;]</b> | Response<br>TA updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, setting is used by send and writes commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.<br><br>Note: The Command writes the parameters in NON-VOLATILE memory.<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;sca&gt;</b> GSM 04.11 RP SC address Address-Value field in string format(string should be included in quotation marks); BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (specified by +CSCS in 3GPP TS 27.007); type of address given by <tosca><br><b>&lt;tosca&gt;</b> Service center address format GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <toda>)<br><b>&lt;scaAlpha&gt;</b> String type(string should be included in quotation marks)<br><br>Service center address alpha data |

|                          |         |
|--------------------------|---------|
| Parameter Saving Mode    | NO_SAVE |
| Max Response Time        | 5s      |
| Reference 3GPP TS 27.005 | Note    |

#### 4.2.13 AT+CSDH Show SMS Text Mode Parameters

| AT+CSDH Show SMS Text Mode Parameters        |   |
|--|---|
| Test Command<br><b>AT+CSDH=?</b>             | <p>Response</p> <p><b>+CSDH:</b> (list of supported &lt;show&gt;s)</p> <p><b>OK</b></p> <p>Parameter<br/>See Write Command</p>  |
| Read Command<br><b>AT+CSDH?</b>              | <p>Response</p> <p><b>+CSDH:</b> &lt;show&gt;</p> <p><b>OK</b></p> <p>Parameter<br/>See Write Command</p>   |
| Write Command<br><b>AT+CSDH=&lt;show&gt;</b> | <p>Response</p> <p>TA determines whether detailed header information is shown in text mode result codes.</p> <p><b>OK</b></p> <p>Parameter</p> <p><b>&lt;show&gt;</b>      <u>0</u>    Do not show header values defined in commands +CSCA and +CSMP (&lt;sc&gt;,&lt;tosca&gt;,&lt;fo&gt;,&lt;vp&gt;,&lt;pid&gt; and &lt;dc&gt;) nor &lt;length&gt;,&lt;toda&gt; or &lt;tooa&gt; in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode</p> <p>                  1      Show the values in result codes</p> |
| Execution Command<br><b>AT+CSDH</b>          | <p>Response</p> <p><b>OK</b></p>  |
| Parameter Saving Mode                        | NO_SAVE   |
| Max Response Time                            | -   |
| Reference 3GPP TS 27.005                     | Note  |

#### 4.2.14 AT+CSMP Set SMS Text Mode Parameters

| AT+CSMP Set SMS Text Mode Parameters  |   |
|---|---|
| Test Command<br><b>AT+CSMP=?</b>  | Response<br><b>OK</b><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CSMP?</b>   | Response<br><b>+CSMP: &lt;fo&gt;,&lt;vp&gt;,&lt;pid&gt;,&lt;dcs&gt;</b><br><br><b>OK</b><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSMP=[&lt;fo&gt;,&lt;vp&gt;,&lt;pid&gt;,&lt;dcs&gt;]</b> | Response<br>TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text mode is selected (+CMGF=1). It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string).<br><br>Note: The Command writes the parameter <fo> in NON-VOLATILE memory.<br><b>OK</b><br>Parameters<br><fo> Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.<br><vp> Depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)<br><pid> GSM 03.40 TP-Protocol-Identifier in integer format (default 0).<br><dcs> GSM 03.38 SMS Data Coding Scheme in Integer format. |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference<br>3GPP TS 27.005   | Note  |

#### 4.2.15 AT+CSMS Select Message Service

##### AT+CSMS Select Message Service

|   |  |
|---|--|
| Test Command<br><b>AT+CSMS=?</b>                | Response<br><b>+CSMS:</b> (list of supported <service>s)<br><br><b>OK</b><br><br>Parameter<br>See Write Command  |
| Read Command<br><b>AT+CSMS?</b>                 | Response<br><b>+CSMS:</b> <service>,<mt>,<mo>,<bm><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSMS=&lt;service&gt;</b> | Response<br><b>+CSMS:</b> <mt>,<mo>,<bm><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><service>     0   GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2 version 4.7.0; Phase 2+ features which do not require new Command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes))<br>1   GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2+ version; the requirement of <service> setting 1 is mentioned under corresponding command descriptions)<br><mt>           Mobile Terminated Messages:<br>0   Type not supported<br>1   Type supported<br><mo>           Mobile Originated Messages:<br>0   Type not supported<br>1   Type supported<br><bm>           Broadcast Type Messages:<br>0   Type not supported<br>1   Type supported |
| Parameter Saving Mode                           | NO_SAVE  |
| Max Response Time                               | -  |
| Reference<br>3GPP TS 27.005                     | Note   |

## 5 AT Commands Special for SIMCom

### 5.1 Overview

| Command      | Description   |
|--------------|---|
| AT+CPOWD     | Power off   |
| AT+CADC      | Read ADC  |
| AT+CFGRI     | Indicate RI when using URC                              |
| AT+CLTS      | Get local timestamp                                     |
| AT+CBAND     | Get and set mobile operation band                       |
| AT+CNBP      | Set the state of the band preference                    |
| AT+CNSMOD    | Show network system mode                                |
| AT+CSCLK     | Configure slow clock                                    |
| AT+CCID      | Show ICCID  |
| AT+CDEVICE   | View Current Flash Device Type                          |
| AT+GSV       | Display product identification information              |
| AT+SGPIO     | Control the GPIO  |
| AT+SLEDS     | Set the timer period of net light                       |
| AT+CNETLIGHT | Close the net light or open it to shining               |
| AT+CSGS      | Netlight indication of GPRS status                      |
| AT+CGPIO     | Control the GPIO by PIN Index                           |
| AT+CBATCHK   | Set VBAT checking feature ON/OFF                        |
| AT+CNMP      | Preferred mode selection                                |
| AT+CMNB      | Preferred selection between CAT-M and NB-IoT            |
| AT+CPSMS     | Power Saving Mode Setting                               |
| AT+CEDRXS    | Entended-DRX Setting                                    |
| AT+CPSI      | Inquiring UE system information                         |
| AT+CGNAPN    | Get Network APN in CAT-M Or NB-IOT                      |
| AT+CSDP      | Service Domain Preference                               |
| AT+MCELLLOCK | Lock the special CAT-M cell                             |
| AT+NCELLLOCK | Lock the special NB-IOT cell                            |
| AT+NBSC      | Config NB-IOT Scrambling Feature                        |
| AT+CAPNMODE  | Select the mode of application configure APN            |
| AT+CRRCSTATE | Query RRC State   |
| AT+CBANDCFG  | Configure CAT-M Or NB-IOT Band                          |
| AT+CNACT     | App Network Active                                      |
| AT+CEDUMP    | Set whether the module reset when the module is crashed |

|             |  |
|-------------|--|
| AT+CNBS     | Configure Band Scan Optimization for NB-IOT        |
| AT+CNDS     | Configure Service Domain Preference For NB-IOT     |
| AT+CENG     | Switch on or off Engineering Mode                  |
| AT+CNACTCFG | IP Protocol Type Config                            |
| AT+CTLIIC   | Control the Switch of IIC                          |
| AT+CWIIC    | Write Values to Register of IIC Device             |
| AT+CRIIC    | Read Values from Register of IIC Device            |
| AT+CMCFG    | Manage Mobile Operator Configuration               |
| AT+CSIMLOCK | SIM Lock   |
| AT+CRATSRCH | Configure parameter for better RAT search          |
| AT+SPWM     | Generate the Pulse-Width-Modulation                |
| AT+CASRIP   | Show Remote IP Address and Port When Received Data |
| AT+CEDRX    | Configure EDRX parameters                          |

## 5.2 Detailed Descriptions of Commands

### 5.2.1 AT+CPOWD Power off

| AT+CPOWD Power Off                         |   |
|--|---|
| Write Command<br><b>AT+CPOWD=&lt;n&gt;</b> | Response<br><b>[NORMAL POWER DOWN]</b>  |
| >  | Parameter<br><b>&lt;n&gt;</b><br>0 Power off urgently (Will not send out NORMAL POWER DOWN)<br>1 Normal power off (Will send out NORMAL POWER DOWN) |
| Parameter Saving Mode                      | NO_SAVE   |
| Max Response Time                          | -   |
| Reference                                  | Note  |

### 5.2.2 AT+CADC Read ADC

| AT+CADC Read ADC                 |   |
|----------------------------------|---|
| Test Command<br><b>AT+CADC=?</b> | Response<br><b>+CADC: (list of supported &lt;status&gt;s),(list of supported &lt;value&gt;s)</b><br><br><b>OK</b> |
|                                  | Parameters<br><b>&lt;status&gt; 1 Success</b>   |

|                          |  |
|--------------------------|--|
|                          | 0 Fail<br><value> Integer 0,100-1700   |
| Read Command<br>AT+CADC? | Response<br>+CADC: <status>,<value><br><br><b>OK</b><br><br>Parameters<br>See Test Command |
| Parameter Saving Mode    | NO_SAVE  |
| Max Response Time        | 2s   |
| Reference                | Note   |

### 5.2.3 AT+CFGRI Indicate RI When Using URC

| AT+CFGRI Indicate RI When Using URC |  |
|-------------------------------------|--|
| Test Command<br>AT+CFGRI=?          | Response<br>+CFGRI: (0-2)<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br>AT+CFGRI?           | Response<br>+CFGRI: <status><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br>AT+CFGRI=<status>  | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><status>    0    Off<br>1    On(TCPIP, FTP and URC control RI pin)<br>2    On(only TCP/IP control RI pin) |
| Parameter Saving Mode               | -  |
| Max Response Time                   | -  |
| Reference                           | Note   |



- RI pin can not controll by "AT+CFGRI" command when module has call service or receiving SMS.

## 5.2.4 AT+CLTS Get Local Timestamp

| AT+CLTS Get Local Timestamp     |  |
|---------------------------------|--|
| Test Command<br>AT+CLTS=?       | Response<br>+CLTS: "yy/MM/dd,hh:mm:ss+/-zz"<br><br>OK  |
| Read Command<br>AT+CLTS?        | Response<br>+CLTS: <mode><br><br>OK  |
| Write Command<br>AT+CLTS=<mode> | Response<br>OK<br>ERROR  |
|                                 | Parameters<br><mode><br><br>0 Disable<br>1 Enable  |
|                                 | Unsolicited Result Code<br>When "get local timestamp" function is enabled, the following URC may be reported if network sends the message to the MS to provide the MS with subscriber specific information.<br>1. Refresh network name by network:<br>*PSNWID: "<mcc>", "<mnc>", "<full network name>",<full network name CI>,<short network name>,<short network name CI><br><br>2. Refresh time and time zone by network:<br>This is UTC time, the time queried by AT+CCLK command is local time.<br>*PSUTTZ: <year>,<month>,<day>,<hour>,<min>,<sec>,<time zone>,<dst><br><br>3. Refresh network time zone by network:<br>+CTZV: "<time zone>"<br><br>4. Refresh Network Daylight Saving Time by network:<br>DST: <dst> |

|                       |   |
|-----------------------|---|
|                       | <p>Parameters</p> <p><b>&lt;mcc&gt;</b> String type; mobile country code</p> <p><b>&lt;mnc&gt;</b> String type; mobile network code</p> <p><b>&lt;full network name&gt;</b> String type; name of the network in full length.</p> <p><b>&lt;full network name CI&gt;</b> Integer type; indicates whether to add CI.</p> <p>0 The MS will not add the initial letters of the Country's Name to the text string.</p> <p>1 The MS will add the initial letters of the Country's Name and a separator (e.g. a space) to the text string.</p> <p><b>&lt;short network name&gt;</b> String type; abbreviated name of the network</p> <p><b>&lt;short network name CI&gt;</b> Integer type; indicates whether to add CI.</p> <p>0 The MS will not add the initial letters of the Country's Name to the text string.</p> <p>1 The MS will add the initial letters of the Country's Name and a separator (e.g. a space) to the text string.</p> <p><b>&lt;year&gt;</b> 4 digits of year (from network)</p> <p><b>&lt;month&gt;</b> Month (from network)</p> <p><b>&lt;day&gt;</b> Day (from network)</p> <p><b>&lt;hour&gt;</b> Hour (from network)</p> <p><b>&lt;min&gt;</b> Minute (from network)</p> <p><b>&lt;sec&gt;</b> Second (from network)</p> <p><b>&lt;time zone&gt;</b> String type; network time zone. If the network time zone has been adjusted for Daylight Saving Time, the network shall indicate this by including the &lt;dst&gt; (Network Daylight Saving Time)</p> <p><b>&lt;dst&gt;</b> Network Daylight Saving Time; the content of this indicates the value that used to adjust the network time zone</p> <p>0 No adjustment for Daylight Saving Time</p> <p>1 +1 hour adjustment for Daylight Saving</p> <p>2 +2 hours adjustment for Daylight Saving Time</p> <p>others Reserved</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <p>Support for this Command will be network dependent.</p> <p>Set <b>AT+CLTS=1</b>, it means user can receive network time updating and use <b>AT+CCLK</b> to show current time.</p> <p><b>*PSUTTZ</b> may report twice.</p>  |

### 5.2.5 AT+CBAND Get and Set Mobile Operation Band

#### AT+CBAND Get and Set Mobile Operation Band

|  |  |
|--|--|
| Test Command<br><b>AT+CBAND=?</b>                | Response<br><b>+CBAND:</b> (list of supported <op_band>s)<br><br><b>OK</b>   |
|  | Parameter<br>See Write Command   |
| Read Command<br><b>AT+CBAND?</b>                 | Response<br><b>+CBAND:</b> <op_band><br><br><b>OK</b>  |
|  | Parameter<br>See Write Command   |
| Write Command<br><b>AT+CBAND=&lt;op_band&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameter<br><b>&lt;op_band&gt;</b> A string parameter which indicate the operation band.<br>And the following strings should be included in quotation marks.<br><br>EGSM_MODE<br>DCS_MODE<br>ALL_MODE |
| Parameter Saving Mode                            | AUTO_SAVE  |
| Max Response Time                                | -  |
| Reference  | Note <ul style="list-style-type: none"> <li>● Radio settings are stored in non-volatile memory.</li> <li>● Only for GSM</li> </ul>   |

### 5.2.6 AT+CNBP Set the state of the band preference

| <b>AT+CNBP Set the state of the band preference</b> |  |
|---|--|
| Read Command<br><b>AT+CNBP?</b>                     | Response<br><b>+CNBP:</b> <mode>[,<lte_mode>]<br><br><b>OK</b> |
|   | Parameter<br>See Write Command                                 |
| Write Command<br><b>AT+CNBP=&lt;mode&gt;</b>        | Response<br><b>OK</b>  |

| de>[,<lte_mode><br>] | ERROR   |
|----------------------|---|
|                      | Parameter   |
|                      | <p><b>&lt;mode&gt;</b> 64bit number, the value is "1" &lt;&lt; "&lt;pos&gt;", then or by bit.<br/>Some special mode value declared below:<br/>0x40000000 BAND_PREF_NO_CHANGE</p> <p><b>&lt;pos&gt;</b><br/>0xFFFFFFFF7FFFFFFF Any (any value)<br/>7 GSM_DCS_1800<br/>8 GSM_EGSM_900<br/>9 GSM_PGSM_900</p> <p><b>&lt;lte_mode&gt;</b> 64bit number, the value is "1" &lt;&lt; "&lt;lte_pos&gt;", then or by bit</p> <p><b>&lt;lte_pos&gt;</b><br/>0x000007FF3FDF3FFF Any (any value)</p> <p>0 EUTRAN_BAND1(UL:1920-1980; DL:2110-2170)<br/>1 EUTRAN_BAND2(UL:1850-1910; DL:1930-1990)<br/>2 EUTRAN_BAND3(UL:1710-1785; DL:1805-1880)<br/>3 EUTRAN_BAND4(UL:1710-1755; DL:2110-2155)<br/>4 EUTRAN_BAND5(UL: 824-849; DL: 869-894)<br/>5 EUTRAN_BAND6(UL: 830-840; DL: 875-885)<br/>6 EUTRAN_BAND7(UL:2500-2570; DL:2620-2690)<br/>7 EUTRAN_BAND8(UL: 880-915; DL: 925-960)<br/>8 EUTRAN_BAND9(UL:1749.9-1784.9; DL:1844.9-1879.9)<br/>9 EUTRAN_BAND10(UL:1710-1770; DL:2110-2170)<br/>10 EUTRAN_BAND11(UL:1427.9-1452.9; DL:1475.9-1500.9)<br/>11 EUTRAN_BAND12(UL:698-716; DL:728-746)<br/>12 EUTRAN_BAND13(UL: 777-787; DL: 746-756)<br/>13 EUTRAN_BAND14(UL: 788-798; DL: 758-768)<br/>16 EUTRAN_BAND17(UL: 704-716; DL: 734-746)<br/>17 EUTRAN_BAND18(UL: 815-830; DL: 860-875)<br/>18 EUTRAN_BAND19(UL: 830-845; DL: 875-890)<br/>19 EUTRAN_BAND20(UL: 832-862; DL: 791-821)<br/>20 EUTRAN_BAND21(UL: 1447.9-1462.9; DL:<br/>1495.9-1510.9)<br/>22 EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200)<br/>23 EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559)<br/>24 EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995)<br/>25 EUTRAN_BAND26(UL: 814-849; DL: 859 -894)<br/>26 EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869)<br/>27 EUTRAN_BAND28(703-748; DL: 758-803)<br/>28 EUTRAN_BAND29(UL:1850-1910 or 1710-1755;<br/>DL:716-728)</p> |

|                       |   |  |
|-----------------------|---|--|
|                       | 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)    |
| Parameter Saving Mode | AUTO_SAVE   |  |
| Max Response Time     | -   |  |
| Reference             | Note<br>● Radio settings are stored in non-volatile memory. |  |

### 5.2.7 AT+CNSMOD Show Network System Mode

| AT+CNSMOD Show Network System Mode |  |
|------------------------------------|--|
| Test Command<br>AT+CNSMOD=?        | Response<br><b>+CNSMOD: (list of supported &lt;n&gt;s)</b><br><br><b>OK</b><br>Parameter<br>See Write Command                  |
| Read Command<br>AT+CNSMOD?         | Response<br><b>+CNSMOD: &lt;n&gt;,&lt;stat&gt;</b><br><br><b>OK</b><br>Parameter<br>See Write Command                          |
| Write Command<br>AT+CNSMOD=<br><n> | Response<br><b>OK</b><br><b>ERROR:</b><br>Parameter<br><n><br><u>0</u> Disable auto report the network system mode information |

|                       |  |
|-----------------------|--|
|                       | <p>1 Auto report the network system mode information, command:<br/><b>+CNSMOD: &lt;stat&gt;</b></p> <p><b>&lt;stat&gt;</b></p> <p>0 no service</p> <p>1 GSM</p> <p>3 EGPRS</p> <p>7 LTE M1</p> <p>9 LTE NB</p> |
| Parameter Saving Mode | -  |
| Max Response Time     |  |
| Reference             |  |

### 5.2.8 AT+CSCLK Configure Slow Clock

| AT+CSCLK Configure Slow Clock              |   |
|--|---|
| Test Command<br><b>AT+CSCLK=?</b>          | <p>Response</p> <p><b>+CSCLK:</b> (list of supported &lt;n&gt;s)</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CSCLK?</b>           | <p>Response</p> <p><b>+CSCLK:</b> &lt;n&gt;</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CSCLK=&lt;n&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameter</p> <p><b>&lt;n&gt;</b>     0     Disable slow clock, module will not enter sleep mode.</p> <p>           1     Enable slow clock, it is controlled by DTR. When DTR is high, module can enter sleep mode. When DTR changes to low level, module can quit sleep mode.</p> |
| Parameter Saving Mode                      | AUTO_SAVE   |
| Max Response                               | -   |

|           |      |
|-----------|------|
| Time      |      |
| Reference | Note |

### 5.2.9 AT+CCID Show ICCID

| AT+CCID Show ICCID                  |  |
|-------------------------------------|--|
| Test Command<br><b>AT+CCID=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CCID</b> | Response<br><b>Ccid data</b> [ex. 898600810906F8048812]<br><br><b>OK</b> |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | 2s   |
| Reference                           | Note   |

### 5.2.10 AT+CDEVICE View Current Flash Device Type

| AT+CDEVICE View Current Flash Device Type |   |
|---|---|
| Read Command<br><b>AT+CDEVICE?</b>        | Response<br><b>Device Name: Current flash device type</b><br><b>Ram Size: Current RAM size</b><br><br><b>OK</b> |
| Parameter Saving Mode                     | NO_SAVE   |
| Max Response Time                         | -   |
| Reference<br>V.25ter                      | Note  |

### 5.2.11 AT+GSV Display Product Identification Information

| AT+GSV Display Product Identification Information |  |
|---|--|
| Execution Command<br><b>AT+GSV</b>                | Response<br>TA returns product information text<br><br>Example:<br><b>SIMCOM_Ltd</b> |

|                       |   |
|-----------------------|---|
|                       | <b>SIMCOM_SIM7000</b><br><b>Revision: 1351B01SIM7000</b><br><br><b>OK</b> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

### 5.2.12 AT+SGPIO Control the GPIO

| AT+SGPIO Control the GPIO   |  |
|---|--|
| Test Command<br><b>AT+SGPIO=?</b>   | Response<br><b>+SGPIO: (0-1),(0-4),(0-1),(0-1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+SGPIO=&lt;operation&gt;,&lt;GPIO&gt;,&lt;function&gt;,&lt;level&gt;</b><br><b>&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><b>&lt;operation&gt;</b><br>0 Set the GPIO function including the GPIO output.<br>1 Read the GPIO level. Please note that only when the gpio is set as input, user can use parameter 1 to read the GPIO level, otherwise the module will return "ERROR".<br><b>&lt;GPIO&gt;</b> The GPIO you want to be set. (It has relations with the hardware, please refer to the hardware manual)<br><b>&lt;function&gt;</b> Only when <b>&lt;operation&gt;</b> is set to 0, this option takes effect.<br>0 Set the GPIO to input.<br>1 Set the GPIO to output<br><b>&lt;level&gt;</b> 0 Set the GPIO low level<br>1 Set the GPIO high level |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |



### 5.2.13 AT+SLEDS Set the Timer Period of Net Light

| AT+SLEDS Set the Timer Period of Net Light                                       |   |
|--|---|
| Test Command<br><b>AT+SLEDS=?</b>  | Response<br><b>+SLEDS: (1-3),(0,40-65535),(0,40-65535)</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+SLEDS?</b>   | Response<br><b>+SLEDS: &lt;mode&gt;,&lt;timer_on&gt;,&lt;timer_off&gt;</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+SLEDS=&lt;mode&gt;,&lt;timer_on&gt;,&lt;timer_off&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;mode&gt;</b><br>1 Set the timer period of net light while SIM7000 series does not register to the network<br>2 Set the timer period net light while SIM7000 series has already registered to the network<br>3 Set the timer period net light while SIM7000 series is in the state of PPP communication<br><b>&lt;timer_on&gt;</b><br>Timer period of "LED ON" in decimal format which range is 0 or 40-65535(ms)<br><b>&lt;timer_off&gt;</b><br>Timer period of "LED OFF" in decimal format which range is 0 or 40-65535(ms) |
|  |   |
| Parameter Saving Mode  | -   |
| Max Response Time  | -   |
| Reference  | Note<br>The default value is :<br><b>&lt;mode&gt;,&lt;timer_on&gt;,&lt;timer_off&gt;</b><br>1,64,800<br>2,64,3000   |

3,64,300

#### 5.2.14 AT+CNETLIGHT Close the Net Light or Open It to Shining

| AT+CNETLIGHT Close the Net Light or Open It to Shining |   |
|--|---|
| Test Command<br><b>AT+CNETLIGHT=?</b>                  | Response<br><b>+CNETLIGHT: (0,1)</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CNETLIGHT?</b>                   | Response<br><b>+CNETLIGHT: &lt;mode&gt;</b>   |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CNETLIGHT=&lt;mode&gt;</b>      | Response<br><b>OK</b><br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;mode&gt;</b><br>0 Close the net light<br>1 Open the net light to shining |
| Parameter Saving Mode                                  | AUTO_SAVE   |
| Max Response Time                                      | -   |
| Reference  | Note  |

#### 5.2.15 AT+CSGS Netlight Indication of GPRS Status

| AT+CSGS Netlight Indication of GPRS Status |                                 |
|--|---------------------------------|
| Test Command<br><b>AT+CSGS=?</b>           | Response<br><b>+CSGS: (0-2)</b> |
|  | <b>OK</b>                       |
|  | Parameters<br>See Write Command |

|  |  |
|--|--|
| Read Command<br><b>AT+CSGS?</b>              | Response<br><b>+CSGS: &lt;mode&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CSGS=&lt;mode&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b>  |
|  | Parameters<br><b>&lt;mode&gt;</b><br><ul style="list-style-type: none"> <li>0    Disable</li> <li>1    Enable, the netlight will be forced to enter into 64ms on/300ms off blinking state in GPRS data transmission service. Otherwise, the netlight state is not restricted.</li> <li>2    Enable, the netlight will blink according to <b>AT+SLEDS</b> in GPRS data transmission service.</li> </ul> |
| Parameter Saving Mode                        | NO_SAVE  |
| Max Response Time                            | -  |
| Reference                                    | Note   |

### 5.2.16 AT+CGPIO Control the GPIO by PIN Index

| <b>AT+CGPIO Control the GPIO by PIN Index</b>   |   |
|---|---|
| Test Command<br><b>AT+CGPIO=?</b>   | Response<br><b>+CGPIO: (0-1),( list of supported &lt;pin&gt;s),(0-1),(0-1)</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGPIO=&lt;operation&gt;,&lt;pin&gt;,&lt;function&gt;,&lt;level&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|   | Parameters<br><b>&lt;operation&gt;</b><br><ul style="list-style-type: none"> <li>0    Set the GPIO function including the GPIO output .</li> <li>1    Read the GPIO level. Please note that only when the gpio is set as input, user can use parameter 1 to read the GPIO level, otherwise the</li> </ul> |

|                       |  |
|-----------------------|--|
|                       | <p>module will return "ERROR".</p> <p><b>&lt;pin&gt;</b> The PIN index you want to be set. (It has relations with the hardware, please refer to the hardware manual)</p> <p><b>&lt;function&gt;</b> Only when <b>&lt;operation&gt;</b> is set to 0, this option takes effect.</p> <p>0 Set the GPIO to input.</p> <p>1 Set the GPIO to output</p> <p><b>&lt;level&gt;</b></p> <p>0 Set the GPIO low level</p> <p>1 Set the GPIO high level</p> |
| Parameter Saving Mode | -  |
| Max Response Time     | -  |
| Reference             | Note   |

### 5.2.17 AT+CBATCHK Set VBAT Checking Feature ON/OFF

| AT+CBATCHK Set VBAT Checking Feature ON/OFF     |   |
|---|---|
| Test Command<br><b>AT+CBATCHK=?</b>             | <p>Response</p> <p><b>+CBATCHK: (0,1)</b></p> <p><b>OK</b></p>  |
| Read Command<br><b>AT+CBATCHK?</b>              | <p>Response</p> <p><b>+CBATCHK: &lt;mode&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CBATCHK=&lt;mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If failed:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b> 0 Close the function of VBAT checking</p> <p>1 Open the function of VBAT checking</p> |
| Parameter Saving Mode                           | AUTO_SAVE   |
| Max Response Time                               | -   |
| Reference                                       | Note  |

## 5.2.18 AT+CNMP Preferred Mode Selection

| AT+CNMP Preferred Mode Selection |  |
|----------------------------------|--|
| Test Command<br>AT+CNMP=?        | Response<br>+CNMP: (list of supported <mode>s)<br><br>OK   |
| Read Command<br>AT+CNMP?         | Response<br>+CNMP: <mode><br><br>OK<br><br>Parameters<br>See Write Command   |
| Write Command<br>AT+CNMP=<mode>  | Response<br>OK<br>If failed:<br>+CME ERROR: <err><br><br>Parameters<br><mode> 2 Automatic<br>13 GSM only<br>38 LTE only<br>51 GSM and LTE only |
| Parameter Saving Mode            | AUTO_SAVE  |
| Max Response Time                | -  |
| Reference                        | Note<br>Default value of parameter <mode> is different among SIM7000 series project.   |

## 5.2.19 AT+CMNB Preferred Selection between CAT-M and NB-IoT

| AT+CMNB Preferred Selection between CAT-M and NB-IoT |  |
|--|--|
| Test Command<br>AT+CMNB=?                            | Response<br>+CMNB: (list of supported<mode>s)<br><br>OK                    |
| Read Command<br>AT+CMNB?                             | Response<br>+CMNB: <mode><br><br>OK<br><br>Parameters<br>See Write Command |

|  |   |
|--|---|
| Write Command<br><b>AT+CMNB=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;mode&gt;</b> 1    CAT-M<br>2    NB-Iot<br>3    CAT-M and NB-IoT |
| Parameter Saving Mode                        | AUTO_SAVE   |
| Max Response Time                            | -   |
| Reference                                    | Note<br>Default value of parameter <b>&lt;mode&gt;</b> is different among SIM7000 series project.   |

### 5.2.20 AT+CPSMS Power Saving Mode Setting

| AT+CPSMS Power Saving Mode Setting   |  |
|--|--|
| Test Command<br><b>AT+CPSMS=?</b>  | Response<br><b>+CPSMS:</b> (list of supported <b>&lt;mode&gt;s</b> ),(list of supported <b>&lt;Requested_Periodic-RAU&gt;s</b> ),(list of supported <b>&lt;Requested_GPRS-READY-timer&gt;s</b> ),(list of supported <b>&lt;Requested_Periodic-TAU&gt;s</b> ),(list of supported <b>&lt;Requested_Active-Time&gt;s</b> )<br><br><b>OK</b> |
| Read Command<br><b>AT+CPSMS?</b>   | Response<br><b>+CPSMS:</b> <b>&lt;mode&gt;</b> ,[ <b>&lt;Requested_Periodic-RAU&gt;</b> ],[ <b>&lt;Requested_GPRS-READY-timer&gt;</b> ],[ <b>&lt;Requested_Periodic-TAU&gt;</b> ],[ <b>&lt;Requested_Active-Time&gt;</b> ]<br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CPSMS=[&lt;mode&gt;],[&lt;Requested_Periodic-RAU&gt;],[&lt;Requested_GPRS-READY-timer&gt;],[&lt;Requested_Periodic-TAU&gt;]</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;mode&gt;</b><br>0    Disable the use of PSM<br>1    Enable the use of PSM  |

|  |  |
|--|--|
| <p>&gt;[,&lt;Requested_Active-Time&gt;]]]]</p> | <p>&lt;Requested_Periodic-RAU&gt; Not supported</p> <p>&lt;Requested_GPRS-READY-timer&gt; Not supported</p> <p>&lt;Requested_Periodic-TAU&gt;</p> <p>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.</p> <p>&lt;Requested_Active-Time&gt;</p> <p>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.</p> |
| <p>Parameter Saving Mode</p>                   | <p>AUTO_SAVE</p>   |
| <p>Max Response Time</p>                       | <p>-</p>   |
| <p>Reference</p>                               | <p>Note</p>  |

### 5.2.21 AT+CEDRXS Entended-DRX Setting

| AT+CEDRXS                              | Entended-DRX Setting   |
|--|--|
| <p>Test Command</p> <p>AT+CEDRXS=?</p> | <p>Response</p> <p>+CEDRXS: (list of supported &lt;n&gt;s),&lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;</p> <p>OK</p>             |
| <p>Read Command</p> <p>AT+CEDRXS?</p>  | <p>Response</p> <p>+CEDRXS: &lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p> |
| <p>Write Command</p>                   | <p>Response</p>  |

|  |   |
|--|---|
| <b>AT+CEDRXS=&lt;n&gt;,&lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;</b> | <b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br>Parameters<br><b>&lt;n&gt;</b><br>0   Disable the use of eDRX<br>1   Enable the use of eDRX<br>2   Enable the use of eDRX and auto report<br>3   Disable the use of eDRX(Reserved)<br><b>&lt;AcT-type&gt;</b><br>4   CAT-M<br>5   NB-IoT<br><b>&lt;Requested_eDRX_value&gt;</b> Requested eDRX value. 4 bit format.<br>"0000"-"1111" |
| Parameter Saving Mode  | AUTO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note<br>● The Requested_eDRX_value is the value of cycle length, separately means<br>5.12,10.24,20.48,40.96,61.44,81.92,102.40,122.88,143.36,163.84,327.68,655.36,1310.72,2621.44,5242.88,10485.76.(seconds)  |

### 5.2.22 AT+CPSI Inquiring UE System Information

| AT+CPSI Inquiring UE System Information |   |
|---|---|
| Test Command<br><b>AT+CPSI=?</b>        | Response<br><b>OK</b>   |
| Read Command<br><b>AT+CPSI?</b>         | If camping on a gsm cell:<br><b>+CPSI: &lt;System Mode&gt;,&lt;Operation Mode&gt;,&lt;MCC&gt;-&lt;MNC&gt;,&lt;LAC&gt;,&lt;Cell ID&gt;,&lt;Absolute RF Ch Num&gt;,&lt;RxLev&gt;,&lt;Track LO Adjust&gt;,&lt;C1-C2&gt;</b><br><br><b>OK</b><br>If camping on a CAT-M or NB-IOT cell:<br><b>+CPSI: &lt;System Mode&gt;,&lt;Operation Mode&gt;,&lt;MCC&gt;-&lt;MNC&gt;,&lt;TAC&gt;,&lt;SCellID&gt;,&lt;PCellID&gt;,&lt;Frequency Band&gt;,&lt;earfcn&gt;,&lt;dlbw&gt;,&lt;ulbw&gt;,&lt;RSRQ&gt;,&lt;RSRP&gt;,&lt;RSSI&gt;,&lt;RSSNR&gt;</b><br><br><b>OK</b><br>If no service:<br><b>+CPSI: NO SERVICE,Online</b> |



**OK**

If failed:

**+CME ERROR: <err>**

Parameters

**<System Mode>** System mode.

"NO SERVICE"

"GSM"

"LTE CAT-M1"

"LTE NB-IOT"

**<Operation Mode>** UE operation mode.

"Online",

"Offline",

"Factory Test Mode",

"Reset",

"Low Power 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

**<TAC>** Tracing Area Code

**<SCellID>** Serving Cell ID

**<PCellID>** Physical Cell ID

**<Frequency Band>** Frequency Band of active set

**<earfcn>** E-UTRA absolute radio frequency channel number for searching CAT-M or NB-IOT 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. Available for CAT-M or NB-IOT.

**<RSRQ>** Current reference signal receive quality as measured by L1.

**<RSSI>** Current Received signal strength indicator

**<RSSNR>** Average reference signal signal-to-noise ratio of the serving cell The value of **SINR** can be calculated according to **<RSSNR>**, the formula is as below:

$$\text{SINR} = 2 * \text{<RSSNR>} - 20$$

The range of **SINR** is from -20 to 30

|                       |      |
|-----------------------|------|
| Parameter Saving Mode | -    |
| Max Response Time     | -    |
| Reference             | Note |

### 5.2.23 AT+CGNAPN Get Network APN in CAT-M Or NB-IOT

| AT+CGNAPN Get Network APN in CAT-M Or NB-IOT |   |
|--|---|
| Test Command<br>AT+CGNAPN=?                  | Response<br>+CGNAPN: (list of supported <valid>s),<length><br><br>OK  |
| Execution Command<br>AT+CGNAPN               | Response<br>+CGNAPN: <valid>,<Network_APN><br><br>OK<br>If failed:<br>+CME ERROR: <err>   |
|  | Parameters<br><valid><br>0 The network did not sent APN parameter to UE.In the case,<Network_APN> is NULL.<br>1 The network sent APN parameter to UE.<br><length><br>Max the length of <network_APN>.<br><Network_APN><br>String type.The network sends APN parameter to UE when UE registers CAT-M or NB-IOT network successfully.In GSM,<Network_APN> always is NULL. |
| Parameter Saving Mode                        | -   |
| Max Response Time                            | -   |
| Reference                                    | Note<br><ul style="list-style-type: none"> <li>In CAT-M or NB-IOT,after UE sending attach request message,If core network responds attach accept message that includes APN parameter,&lt;Network_APN&gt; is valid.</li> </ul>   |

### 5.2.24 AT+CSDP Service Domain Preference

| AT+CSDP Service Domain Preference |
|-----------------------------------|
|-----------------------------------|

|  |  |
|--|--|
| Test Command<br><b>AT+CSDP=?</b>               | Response<br><b>+CSDP:</b> (list of supported <domain>s)<br><br><b>OK</b>   |
| Read Command<br><b>AT+CSDP?</b>                | Response<br><b>+CSDP:</b> <domain><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSDP=&lt;domain&gt;</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;domain&gt;</b><br>0 CS(Circuit Switched Domain) ONLY<br>1 PS(Packet Switched Domain) ONLY<br><u>2</u> CS(Circuit Switched Domain) + PS(Packet Switched Domain) |
| Parameter Saving Mode                          | AUTO_SAVE_REBOOT   |
| Max Response Time                              | -  |
| Reference                                      | Note   |

### 5.2.25 AT+MCELLLOCK Lock the special CAT-M cell

| <b>AT+MCELLLOCK Lock the special CAT-M cell</b>                                |  |
|--|--|
| Test Command<br><b>AT+MCELLLOCK=?</b>  | Response<br><b>+MCELLLOCK:</b> (0,1),(0-65535),(0-503)<br><br><b>OK</b>  |
| Read Command<br><b>AT+MCELLLOCK?</b>   | Response<br><b>+MCELLLOCK:</b> <mode>[,<earfcn>,<pci>]<br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+MCELLLOCK=&lt;mode&gt;[,&lt;earfcn&gt;,&lt;pci&gt;]</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>  |

|                       |  |
|-----------------------|--|
|                       | <p>Parameter</p> <p><b>&lt;mode&gt;</b>      <u>0</u>    Unlock<br/>                     1    Lock</p> <p><b>&lt;earfcn&gt;</b>      A number in the range 0-65535 representing the EARFCN to search</p> <p><b>&lt;pci&gt;</b>           A number in the range 0-503 representing the Physical Cell ID to search</p> |
| Parameter Saving Mode | AUTO_SAVE_REBOOT   |
| Max Response Time     | -  |
| Reference             | Note   |

#### 5.2.26 AT+NCELLLOCK Lock the special NB-IOT cell

| <b>AT+NCELLLOCK    Lock the special NB-IOT cell</b>                            |  |
|--|--|
| Test Command<br><b>AT+NCELLLOCK=?</b>  | <p>Response</p> <p><b>+NCELLLOCK: (0,1),(0-65535),(0-503)</b></p> <p><b>OK</b></p>   |
| Read Command<br><b>AT+NCELLLOCK?</b>   | <p>Response</p> <p><b>+NCELLLOCK: &lt;mode&gt;[,&lt;earfcn&gt;,&lt;pci&gt;]</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+NCELLLOCK=&lt;mode&gt;[,&lt;earfcn&gt;,&lt;pci&gt;]</b> | <p>Response</p> <p><b>OK</b></p> <p>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameter</p> <p><b>&lt;mode&gt;</b>      <u>0</u>    Unlock<br/>                     1    Lock</p> <p><b>&lt;earfcn&gt;</b>      A number in the range 0-65535 representing the EARFCN to search</p> <p><b>&lt;pci&gt;</b>           A number in the range 0-503 representing the Physical Cell ID to search</p> |
| Parameter Saving Mode  | AUTO_SAVE_REBOOT   |
| Max Response Time  | -  |
| Reference  | Note   |

### 5.2.27 AT+NBSC Config NB-IOT Scrambling Feature

| AT+NBSC Config NB-IOT Scrambling Feature     |  |
|--|--|
| Test Command<br><b>AT+NBSC=?</b>             | Response<br><b>+NBSC:</b> (list of supported <mode>s)<br><br><b>OK</b>   |
| Read Command<br><b>AT+NBSC?</b>              | Response<br><b>+NBSC:</b> <mode><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+NBSC=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameters<br><b>&lt;mode&gt;</b><br>0 Disable the scrambling feature in NB-IOT network.<br>1 Enable the scrambling feature in NB-IOT network. |
| Parameter Saving Mode                        | AUTO_SAVE_REBOOT   |
| Max Response Time                            | -  |
| Reference                                    | Note<br>● Please configure UE in accordance with the base station,Otherwise UE can not register NB-IOT network.                                |

### 5.2.28 AT+CAPNMODE Select the Mode of Application Configure APN

| AT+CAPNMODE Select the Mode of Application Configure APN |  |
|--|--|
| Test Command<br><b>AT+CAPNMODE=?</b>                     | Response<br><b>+CAPNMODE:</b> (list of supported <mode>s)<br><br><b>OK</b> |
| Read Command<br><b>AT+CAPNMODE?</b>                      | Response<br><b>+CAPNMODE:</b> <mode><br><br><b>OK</b>                      |
|  | Parameters   |

|   |   |
|---|---|
|   | See Write Command   |
| Write Command<br><b>AT+CAPNMOD</b><br><b>E=&lt;mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If failed:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b> mode of application configure APN. In CAT-M or NB-IOT network, if module has registered to the network successfully, it will get an APN from base station delivering.</p> <p>0 Automatic mode. Applications(AT+CSTT and AT+SAPBR) do not need to config APN, it will use the APN from base station delivering.</p> <p>1 Manual mode. Applications(AT+CSTT, AT+SAPBR) need to config APN, these APNs can get from operators.</p> |
| Parameter Saving Mode                                       | -   |
| Max Response Time   | -   |
| Reference   | <p>Note</p> <ul style="list-style-type: none"> <li>If module are using in GPRS network, you must config <b>&lt;mode&gt;</b> to 1</li> </ul>   |

### 5.2.29 AT+CRRCSTATE Query RRC State

|   |   |
|---|---|
| <b>AT+CRRCSTATE Query RRC State</b>                       |   |
| Test Command<br><b>AT+CRRCSTAT</b><br><b>E=?</b>          | <p>Response</p> <p><b>+CRRCSTATE: (list of supported &lt;n&gt;s)</b></p> <p><b>OK</b></p>   |
| Read Command<br><b>AT+CRRCSTAT</b><br><b>E?</b>           | <p>Response</p> <p><b>+CRRCSTATE: &lt;n&gt;, &lt;state&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CRRCSTAT</b><br><b>E=&lt;n&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If failed:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> Integer type</p> <p>0 Disable unsolicited result code</p> <p>1 Enable unsolicited result code "+CRRCSTATE: &lt;state&gt;"</p> <p><b>&lt;state&gt;</b> Integer type, indicates RRC connection state</p> |

|                       |   |
|-----------------------|---|
|                       | 0 Idle<br>1 Connected<br>255 Other  |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | Note<br>● The command is only valid that module registering in CAT-M or NB-IOT network. |

### 5.2.30 AT+CBANDCFG Configure CAT-M Or NB-IOT Band

| AT+CBANDCFG Configure CAT-M Or NB-IOT Band                                      |  |
|---|--|
| Test Command<br><b>AT+CBANDCFG=?</b>  | Response<br><b>+CBANDCFG: (CAT-M,NB-IOT),(list of supported &lt;band&gt;s)</b><br><br><b>OK</b>  |
| Read Command<br><b>AT+CBANDCFG?</b>   | Response<br><b>+CBANDCFG: "CAT-M",&lt;band&gt;[,&lt;band&gt;...]</b><br><b>&lt;CR&gt;&lt;LF&gt;+CBANDCFG: "NB-IOT",&lt;band&gt;[,&lt;band&gt;...]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CBANDCFG=&lt;mode&gt;,&lt;band&gt;[,&lt;band&gt;...]</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><mode> string type; network system mode.<br>"CAT-M"      LTE Cat.M1(eMTC)<br>"NB-IOT"    Narrow Band Internet of Things<br><band> Integer type;The value of <band> must is in the band list of getting from AT+CBANDCFG=? |
| Parameter Saving Mode   | AUTO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note<br>● The command can take effect immediately,It does not need to reboot module.   |

### 5.2.31 AT+CNACT App Network Active

| AT+CNACT App Network Active              |   |
|--|---|
| Read Command<br>AT+CNACT?                | Response<br>+CNACT: <status>,<ip_addr><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CNACT=<mode>[,<apn>] | Response<br><b>OK</b><br>If failed:<br>+CME ERROR: <err><br><br>Parameters<br><mode><br>0 Deactive<br>1 Active<br>2 Auto Active<br><br><apn><br>(Access Point Name) A string parameter (string should be included in quotation marks) which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. The default value is NULL.<br><br><status><br>0 Deactivated<br>1 Activated |
| Parameter Saving Mode                    | NO_SAVE   |
| Max Response Time                        | -   |
| Reference                                | Note<br>"+APP PDP: ACTIVE" will be reported if the app network activated, and<br>"+APP PDP: DEACTIVE" will be reported if the app network deactivated.<br>Auto Active means the will active automatically if the activation failed.   |

### 5.2.32 AT+CEDUMP Set Whether the Module Reset When The Module is Crashed

| AT+CEDUMP Set Whether the Module Reset When The Module is Crashed |  |
|---|--|
| Read Command<br>AT+CEDUMP?  | Response<br>+CEDUMP: <mode><br><br><b>OK</b> |



|  |  |
|--|--|
|  | If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CEDUMP=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameters<br><b>&lt;fun&gt;</b><br><u>0</u> The module will reset when the module is crashed(Default)<br>1     The module will go into download mode when the module is crashed |
| Parameter Saving Mode                          | -  |
| Max Response Time                              |  |
| Reference                                      | Note   |

### 5.2.33 AT+CNBS Configure Band Scan Optimization For NB-IOT

| <b>AT+CNBS Configure Band Scan Optimization for NB-IOT</b> |   |
|--|---|
| Test Command<br><b>AT+CNBS=?</b>                           | Response<br><b>+CNBS: (1-5)</b><br><br><b>OK</b>  |
| Read Command<br><b>AT+CNBS?</b>                            | Response<br><b>+CNBS: &lt;n&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CNBS=&lt;n&gt;</b>                  | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br>Band scan is performed in the following levels based on the SNR:<br>level 0   Used for good SNR levels(0 db and above); detects strong cells first and takes the shortest time to acquire cells.UE scans each raster in 30 ms.<br>level 1   Used for medium SNR levels(-9 dB and above),UE scans each |

|                       |  |
|-----------------------|--|
|                       | <p>raster for 200 ms</p> <p>level 2 Used for poor SNR levels(-12.6 dB and above),UE scans each raster for 500 ms.</p> <p>&lt;n&gt;</p> <ol style="list-style-type: none"> <li>1 UE tries SNR level 0 band scan</li> <li>2 UE tries SNR level 0 and level 1 band scan</li> <li>3 UE tries SNR level 0, level 1, and level 2 band scan</li> <li>4 Reserved</li> <li>5 UE tries SNR level 2 band scan only</li> </ol> |
| Parameter Saving Mode | AUTO_SAVE_REBOOT   |
| Max Response Time     | -  |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>● The command controls the band scan for different SNR levels. This optimization is applicable only for NB-IOT and it reduces the band scan time and power consumption.</li> </ul>  |

#### 5.2.34 AT+CNDS Configure Service Domain Preference For NB-IOT

| AT+CNDS Configure Service Domain Preference For NB-IOT |   |
|--|---|
| Test Command<br>AT+CNDS=?                              | <p>Response</p> <p>+CNDS: (list of supported &lt;domain&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+CNDS?                               | <p>Response</p> <p>+CNDS: &lt;domain&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>AT+CNDS=<domain>                      | <p>Response</p> <p><b>OK</b></p> <p>If failed:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;domain&gt;</p> <ol style="list-style-type: none"> <li>1 PS(Packet Switched Domain) ONLY</li> <li>2 CS(Circuit Switched Domain) + PS(Packet Switched Domain)</li> </ol> |
| Parameter Saving Mode                                  | AUTO_SAVE_REBOOT  |

|                   |  |
|-------------------|--|
| Max Response Time | -  |
| Reference         | <p>Note</p> <ul style="list-style-type: none"> <li>The command of <b>AT+CSDP</b> is used to config service domain preference for GSM and CAT-M.If you want to config service domain preference for NB-IOT,you can use <b>AT+CNDS</b>.</li> </ul> |

### 5.2.35 AT+CENG Switch On or Off Engineering Mode

| AT+CENG Switch On or Off Engineering Mode |  |
|---|--|
| Test Command<br><b>AT+CENG=?</b>          | <p>Response</p> <p>TA returns the list of supported modes.</p> <p><b>+CENG:</b> (list of supported <b>&lt;mode&gt;s</b>),(list of supported <b>&lt;Ncell&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CENG?</b>           | <p>Response</p> <p>Engineering Mode is designed to allow a field engineer to view and test the network information received by a handset, when the handset is either in idle mode or dedicated mode (that is: with a call active). In each mode, the engineer is able to view network interaction for the "serving cell" (the cell the handset is currently registered with) or for the neighboring cells.</p> <p>TA returns the current engineering mode. The network information including serving cell and neighboring cells are returned. <b>&lt;cell&gt;</b> carry with them corresponding network interaction.</p> <p>If camping on a gsm cell:</p> <p><b>+CENG:</b> <b>&lt;mode&gt;</b>,<b>&lt;Ncell&gt;</b>,<b>&lt;cell num&gt;</b>,<b>&lt;System Mode&gt;</b></p> <p><b>[+CENG:</b> <b>&lt;cell&gt;</b>,<b>"&lt;bcch&gt;</b>,<b>&lt;rxl&gt;</b>,<b>&lt;bsic&gt;</b>,<b>&lt;cellid&gt;</b>,<b>&lt;mcc&gt;</b>,<b>&lt;mnc&gt;</b>,<b>&lt;lac&gt;"</b><br/> <b>&lt;CR&gt;&lt;LF&gt;</b><b>+CENG:</b> <b>&lt;cell&gt;</b>,<b>"&lt;bcch&gt;</b>,<b>&lt;rxl&gt;</b>,<b>&lt;bsic&gt;</b>,<b>&lt;cellid&gt;</b>,<b>&lt;mcc&gt;</b>,<b>&lt;mnc&gt;</b>,<b>&lt;lac&gt;"</b>...]<br/> <b>OK</b></p> <p>If camping on a CAT-M or NB-IOT cell:</p> <p><b>+CENG:</b> <b>&lt;mode&gt;</b>,<b>&lt;Ncell&gt;</b>,<b>&lt;cell num&gt;</b>,<b>&lt;System Mode&gt;</b></p> <p><b>[+CENG:</b><br/> <b>&lt;cell&gt;</b>,<b>"&lt;earfcn&gt;</b>,<b>&lt;pci&gt;</b>,<b>&lt;rsrp&gt;</b>,<b>&lt;rssi&gt;</b>,<b>&lt;rsrq&gt;</b>,<b>&lt;sinr&gt;</b>,<b>&lt;tac&gt;</b>,<b>&lt;cellid&gt;</b>,<b>&lt;mcc&gt;</b>,<b>&lt;mnc&gt;</b>,<b>&lt;tx power&gt;"</b><br/> <b>&lt;CR&gt;&lt;LF&gt;</b><b>+CENG:</b> <b>&lt;cell&gt;</b>,<b>"&lt;earfcn&gt;</b>,<b>&lt;pci&gt;</b>,<b>&lt;rsrp&gt;</b>,<b>&lt;rssi&gt;</b>,<b>&lt;rsrq&gt;</b>,<b>&lt;sinr&gt;</b></p> |

|  |   |
|--|---|
|  | >"...]  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CENG=&lt;mode&gt;[,&lt;Ncell&gt;]</b> | Switch on or off engineering mode.  |
|  | <b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters  |
|  | <p><b>&lt;mode&gt;</b>      0    Switch off engineering mode<br/>                 1    Switch on engineering mode</p> <p><b>&lt;Ncell&gt;</b>      1    Display neighbor cell ID</p> <p><b>&lt;cell num&gt;</b>   The number of cell,it includes serving cell and neighbor cells.</p> <p><b>&lt;System Mode&gt;</b>   System mode.<br/>                      "NO SERVICE"<br/>                      "GSM"<br/>                      "LTE CAT-M1"<br/>                      "LTE NB-IOT"</p> <p><b>&lt;cell&gt;</b>        0    The serving cell<br/>                 1-6   The index of the neighboring cell</p> <p><b>&lt;bcch&gt;</b>        ARFCN(Absolute radio frequency channel number) of<br/>                      BCCH carrier, in decimal format</p> <p><b>&lt;rxl&gt;</b>         Receive level, in decimal format</p> <p><b>&lt;mcc&gt;</b>         Mobile country code, in decimal format</p> <p><b>&lt;mnc&gt;</b>         Mobile network code, in decimal format</p> <p><b>&lt;bsic&gt;</b>         Base station identity code, in decimal format</p> <p><b>&lt;cellid&gt;</b>       Cell id, in hexadecimal format</p> <p><b>&lt;lac&gt;</b>         Location area code, in hexadecimal format</p> <p><b>&lt;earfcn&gt;</b>      E-UTRA absolute radio frequency channel number for se<br/>                      arching CAT-M or NB-IOT cells</p> <p><b>&lt;pci&gt;</b>         Physical Cell ID</p> <p><b>&lt;rsrp&gt;</b>         Current reference signal received power.Available for<br/>                      CAT-M or NB-IOT.</p> <p><b>&lt;rsqi&gt;</b>         Current Received signal strength indicator</p> <p><b>&lt;rsrq&gt;</b>         Current reference signal receive quality as measured by<br/>                      L1.</p> <p><b>&lt;sinr&gt;</b>         Signal to Interference plus Noise Ratio,The range is from<br/>                      -20 to 30.</p> <p><b>&lt;tac&gt;</b>         Tracing Area Code, in decimal format</p> <p><b>&lt;tx power&gt;</b>    Tx power value in 1/10 dBm. <b>&lt;tx power&gt;</b> is only meaningful<br/>                      when the device is in traffic. When there is no traffic, the<br/>                      value is invalid.The value of <b>&lt;tx power&gt;</b> is 255.</p> |

|                       |      |
|-----------------------|------|
| Parameter Saving Mode | -    |
| Max Response Time     | -    |
| Reference             | Note |

### 5.2.36 AT+CNACTCFG IP Protocol Type Config

| AT+CNACTCFG IP Protocol Type Config   |   |
|---------------------------------------|---|
| Test Command<br>AT+CNACTCFG=?         | Response<br><b>+CNACTCFG: ("IPV4","IPV6","IPV4V6")</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br>AT+CNACTCFG?          | Response<br><b>+CNACTCFG: &lt;IPType&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CNACTCFG=<IPType> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;IPType&gt;</b><br>"IPV4"      IPv4 protocol<br>"IPV6"      IPv6 protocol<br>"IPV4V6"   IPv4 and IPv6 protocol |
| Parameter Saving Mode                 | NO_SAVE   |
| Max Response Time                     | -   |
| Reference                             | Note  |

### 5.2.37 AT+CTLIIC Control the Switch of IIC

#### AT+CTLIIC Control the Switch of IIC

|  |   |
|--|---|
| Test Command<br><b>AT+CTLIIC=?</b>             | Response<br><b>+CTLIIC: (0,1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Read Command<br><b>AT+CTLIIC?</b>              | Response<br><b>+CTLIIC: &lt;mode&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CTLIIC=&lt;mode&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b><br>0   switch off the IIC<br>1   switch on the IIC |
| Parameter Saving Mode                          | NO_SAVE   |
| Max Response Time                              | -   |
| Reference                                      | Note  |

### 5.2.38 AT+CWIIC Write Values to Register of IIC Device

| AT+CWIIC Write Values to Register of IIC Device                                    |  |
|--|--|
| Test Command<br><b>AT+CWIIC=?</b>  | Response<br><b>OK</b>  |
| Write Command<br><b>AT+CWIIC=&lt;addr&gt;,&lt;reg&gt;,&lt;data&gt;,&lt;len&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><b>&lt;addr&gt;</b> Device address. Input format must be hex, such as 0xFF.<br><b>&lt;reg&gt;</b> Register address. Input format must be hex, such as 0xFF.<br><b>&lt;len&gt;</b> Read length. Range: 1-4; unit: byte.<br><b>&lt;data&gt;</b> Data written. Input format must be hex, such as 0xFF-0xFFFFFFFF |

|                       |      |
|-----------------------|------|
| Parameter Saving Mode | -    |
| Max Response Time     | -    |
| Reference             | Note |

### 5.2.39 AT+CRIIIC Read Values from Register of IIC Device

| AT+CRIIIC Read Values from Register of IIC Device |  |
|---|--|
| Test Command<br>AT+CRIIIC=?                       | Response<br><b>OK</b>  |
| Write Command<br>AT+CRIIIC=<addr>,<reg>,<len>     | Response<br><b>+CRIIIC: &lt;data&gt;</b><br><br><b>OK</b><br>or<br><b>ERROR</b>  |
|   | Parameters<br><addr> Device address. Input format must be hex, such as 0xFF.<br><reg> Register address. Input format must be hex, such as 0xFF.<br><len> Read length. Range:1-4; unit:byte.<br><data> Data read. Input format must be hex, such as 0xFF. |
| Parameter Saving Mode                             | -  |
| Max Response Time                                 | -  |
| Reference   | Note   |

### 5.2.40 AT+CMCFG Manage Mobile Operator Configuration

| AT+CMCFG Manage Mobile Operator Configuration |  |
|---|--|
| Test Command<br>AT+CMCFG=?                    | Response<br>TA returns the list of supported modes.<br><b>+CMCFG: (list of supported &lt;mode&gt;s),&lt;length&gt;</b><br><br><b>OK</b>                  |
|   | Parameters<br>See Write Command  |
| Read Command<br>AT+CMCFG?                     | Response<br><b>+CMCFG: &lt;mode&gt;,&lt;config_num&gt;</b><br><b>[+CMCFG: &lt;index&gt;,&lt;config_name&gt;,&lt;config_version&gt;,&lt;state&gt;...]</b> |

|   |  |
|---|--|
|   | <b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CMCFG=&lt;mode&gt;[,&lt;config_name&gt;]</b> | <p>when &lt;mode&gt;=0,1,2 or 3 and command successful:<br/><b>OK</b></p> <p>when &lt;mode&gt;=4 and command successful:<br/><b>+CMCFG: 4,&lt;flag&gt;,&lt;config_name&gt;</b></p> <p><b>OK</b><br/>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b></p> <ul style="list-style-type: none"> <li>0 Manually select mobile operator configuration</li> <li>1 Automatically select mobile operator configuration according to ICCID information in SIM card</li> <li>2 Activate specified mobile operator configuration, &lt;config_name&gt; must be provided.</li> <li>3 Deactivation specified mobile operator configuration, &lt;config_name&gt; must be provided.</li> </ul> <p><b>&lt;length&gt;</b> Integer type,the maximum length of &lt;config_name&gt;</p> <p><b>&lt;config_num&gt;</b> Integer type,the number of mobile network configuration</p> <p><b>&lt;index&gt;</b> Integer type,the index of mobile network configuration</p> <p><b>&lt;config_name&gt;</b> String type,the name of mobile network configuration.</p> <ul style="list-style-type: none"> <li>"Default" Default network configuration</li> <li>"ATT" ATT network configuration, not support VOLTE</li> <li>"Verizon" Verizon network configuration,not support VOLTE</li> </ul> <p><b>&lt;config_version&gt;</b> Hex type,the version of mobile network configuration</p> <p><b>&lt;state&gt;</b> Integer type,the state of mobile network configuration</p> <ul style="list-style-type: none"> <li>0 Inactive</li> <li>1 Active</li> </ul> <p><b>&lt;flag&gt;</b> Integer type,it indicates whether module has activated a network configuration.If network configuration has been activated,The third parameter &lt;config_name&gt; is the name of activating network configuration.</p> <ul style="list-style-type: none"> <li>0 Network configuration has been activated</li> <li>1 Not any network configuration is activated</li> </ul> |
| Parameter Saving Mode   | -  |
| Max Response  | -  |



|           |  |
|-----------|--|
| Time      |  |
| Reference | <p>Note</p> <ul style="list-style-type: none"> <li>After setting <b>AT+CMCFG=1</b>, module can select mobile operator configuration according to ICCID information in SIM card automatically. If network configuration has changed, module will reboot and make configuration effective</li> <li>If module needs to select mobile operator configuration manually, you should do as the following steps. <ol style="list-style-type: none"> <li>Setting manual mode<br/><b>AT+CMCFG=0</b></li> <li>Activate specified configuration<br/><b>AT+CMCFG=2,&lt;config_name&gt;</b></li> <li>Reboot the module<br/><b>AT+CFUN=1,1</b></li> </ol> </li> </ul> |

#### 5.2.41 AT+CSIMLOCK SIM Lock

| AT+CSIMLOCK   | SIM Lock   |
|---|--|
| Test Command<br><b>AT+CSIMLOC<br/>K=?</b>   | <p>Response</p> <p>TA returns the list of supported modes.</p> <p><b>+CSIMLOCK:</b> (list of supported <b>&lt;facility&gt;s</b>), (list of supported <b>&lt;mode&gt;s</b>), <b>&lt;pwlength&gt;</b>, <b>&lt;pclength&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CSIMLOC<br/>K?</b>  | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CSIMLOC<br/>K=&lt;facility&gt;,&lt;m<br/>ode&gt;[,&lt;password<br/>&gt;[,&lt;pers_code_li<br/>st&gt;]]</b> | <p>If <b>&lt;mode&gt;≠2</b> and Command is successful</p> <p><b>OK</b></p> <p>If <b>&lt;mode&gt;=2</b> and Command is successful</p> <p><b>+CSIMLOCK: &lt;status&gt;,&lt;pers_code_list&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b> If failed:</p> <p>Parameters</p> <p><b>&lt;facility&gt;</b> String type, Phone security locks set by factory or customer. which can be:</p> <p>"PN" Network Personalisation</p> <p><b>&lt;mode&gt;</b> 0 unlock</p> |

|                       |   |
|-----------------------|---|
|                       | <p>1 lock</p> <p>2 query status</p> <p><b>&lt;pwlength&gt;</b> Integer type,maximum length of <b>&lt;password&gt;</b>,the maximum length is 16.</p> <p><b>&lt;pclength&gt;</b> Integer type,maximum length of <b>&lt;pers_code_list&gt;</b>,the maximum length is 160.</p> <p><b>&lt;password&gt;</b> String type,password is used to lock or unlock a <b>&lt;facility&gt;</b>.</p> <p><b>&lt;pers_code_list&gt;</b> String type,code list for device personalization.The contents depend on the selected <b>&lt;facility&gt;</b>.<br/>If <b>&lt;facility&gt;</b> is "PN":<br/><b>&lt;pers_code_list&gt;</b> is in the format:<br/>"MCC1-MNC1[;MCC2-MNC2[...]] "<br/>It contains a list of pairs of MCC and MNC.MCC and MNC is separated by a '-',every pair of MCC and MNC is separated by semicolon.<br/>For example:<br/><b>"460-00;460-01"</b></p> <p><b>&lt;status&gt;</b> Integer type,the status of lock<br/>0 lock is inactive<br/>1 lock is active</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>Lock device<br/>Customer can send AT command to lock the device that can only use some specific SIM card.<br/><b>AT+CSIMLOCK="PN",1,"0123456789ABCDEF","460-00;460-01"</b></li> <li>Unlock device<br/>If the device is locking, Customer can send AT command to unlock the device.<br/><b>AT+CSIMLOCK="PN",0,"ABCDEFGH12345678"</b></li> <li>Query device status<br/>customer may send AT command as follow to query status of the device<br/><b>AT+CSIMLOCK="PN",2</b></li> </ul>   |

#### 5.2.42 AT+CRATSRCH Configure Parameter for Better RAT Search

| AT+CRATSRCH Configure Parameter for Better RAT Search |  |
|---|--|
| Test Command  | Response   |
| <b>AT+CRATSRCH=?</b>                                  | <p>TA returns the list of supported modes.</p> <p><b>+CRATSRCH:</b> (list of supported <b>&lt;rat_timer&gt;</b>s),(list of supported</p> |

|  |   |
|--|---|
|  | <p>&lt;srch_align&gt;),</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br><b>AT+CRATSRCH?</b>                                      | <p>Response<br/><b>+CRATSRCH: &lt;rat_timer&gt;,&lt;srch_align&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+CRATSRCH=&lt;rat_timer&gt;,&lt;srch_align&gt;</b> | <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b>If failed:</p> <p>Parameters<br/> <b>&lt;rat_timer&gt;</b> Integer type, <b>&lt;rat_timer&gt;</b> is timeout for better RAT(radio access technology) search The default value is 60, expressed in minutes.For SIM7000 series modules,the priority of RAT is as follows:<br/> <b>CAT-M &gt; NB-IOT &gt; GSM</b><br/>           If UE has registered successfully GSM network,it will try to search CAT-M and NB-IOT network after the timer expiring.<br/> <b>&lt;srch_align&gt;</b> Integer type, <b>&lt;srch_align&gt;</b> specifies an interval before eDRX page when a scan should begin.The default value is 20,expressed in minutes.         </p> |
| Parameter Saving Mode  | -   |
| Max Response Time  | -   |
| Reference  | Note  |

### 5.2.43 AT+SPWM Generate the Pulse-Width-Modulation

| <b>AT+SPWM Generate the Pulse-Width-Modulation</b> |  |
|--|--|
| Test Command<br><b>AT+SPWM=?</b>                   | <p>Response<br/><b>+SPWM: (list of supported&lt;div&gt;s),(list of supported&lt;level&gt;s)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |

|  |   |
|--|---|
| <b>Write Command</b><br><b>AT+SPWM=&lt;div&gt;</b><br><b>v&gt;,&lt;level&gt;</b> | <b>Response</b><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br><b>Parameters</b><br><b>&lt;div&gt;</b> The range of <div> is 0-31, the output frequency equals to (192KHz)/(period+1).<br><b>&lt;level&gt;</b> 0-100: tone level, which can be converted to duty ratio.  |
| <b>Reference</b>   | <b>Note</b> <ul style="list-style-type: none"> <li>● The equation of final frequency and &lt;period&gt; is this:<br/>frequency=192KHz/(period+1), when <b>div</b> is 0 or 1, the period is 1. When <b>div</b> is 2, the period is 1.5. When <b>div</b> is 3, the period is 2. When <b>div</b> is 4, the period is 2.5.....</li> <li>● The equation of &lt;level&gt; and duty factor is: duty factor=(level+1).</li> </ul> |

#### 5.2.44 AT+CASRIP Show Remote IP address and Port When Received Data

| <b>AT+CASRIP Show Remote IP Address and Port When Received Data</b> |  |
|---|--|
| <b>Read Command</b><br><b>AT+CASRIP?</b>                            | <b>Response</b><br><b>+CASRIP: &lt;mode&gt;</b><br><br><b>OK</b><br><br><b>Parameters</b><br>See Write Command   |
| <b>Write Command</b><br><b>AT+CASRIP=&lt;mode&gt;</b>               | <b>Response</b><br><b>OK</b><br>or<br><b>ERROR</b><br><br><b>Parameters</b><br><b>&lt;mode&gt;</b> A numeric parameter which shows remote IP address and port.<br>0 Do not show the prompt<br>1 Show the prompt, the format is as follows: |
| <b>Parameter Saving Mode</b>  | NO_SAVE  |
| <b>Max Response Time</b>  | -  |
| <b>Reference</b>  |  |

#### 5.2.45 AT+CEDRX Configure EDRX parameters

| <b>AT+CEDRX Configure EDRX parameters</b> |                 |
|---|-----------------|
| <b>Test Command</b>                       | <b>Response</b> |

|   |  |
|---|--|
| AT+CEDRX=?  | <p>+CEDRX: (0-3),(0-1),(0-15),(0-15)</p> <p>OK</p>   |
| Read Command<br>AT+CEDRX?                                       | <p>Response</p> <p>+CEDRX: &lt;mode&gt;,&lt;enabled&gt;,&lt;ptw&gt;,&lt;cycle_length&gt;</p> <p>...</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CEDRX=<mode>,<enabled>,<ptw>,<cycle_length> | <p>Response</p> <p>OK</p> <p>If failed:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;mode&gt;    0   GSM<br/>            1   LTE<br/>            2   NB-IoT<br/>            3   CAT-M</p> <p>&lt;enabled&gt; 0   Disable<br/>            1   Enable</p> <p>&lt;ptw&gt;      Page time window<br/>            0-15</p> <p>&lt;cycle_length&gt;    0-15</p>   |
| Reference   | <p>Note</p> <ul style="list-style-type: none"> <li>● The value 0-15 of ptw separately means 1280,2560,3840,5120,6400,7680,8960,10240,11520,12800,14080,15360,16640,17920,19200,20480.(ms)</li> <li>● The value 0-15 of cycle_length separately means 5.12,10.24,20.48,40.96,61.44,81.92,102.40,122.88,143.36,163.84,327.68,655.36,1310.72,2621.44,5242.88,10485.76.(seconds)</li> <li>● There has no effect if &lt;mode&gt; is 0 or 1.</li> <li>● The edrx parameters can take effect after module restarting</li> </ul> |

## 6 AT Commands for GPRS Support

### 6.1 Overview of AT Commands for GPRS Support

| Command    | Description                        |
|------------|------------------------------------|
| AT+CGATT   | Attach or detach from GPRS service |
| AT+CGDCONT | Define PDP context                 |
| AT+CGACT   | PDP context activate or deactivate |
| AT+CGPADDR | Show PDP address                   |
| AT+CGREG   | Network registration status        |
| AT+CGSMS   | Select service for MO SMS messages |
| AT+CEREG   | EPS Network Registration Status    |

### 6.2 Detailed Descriptions of AT Commands for GPRS Support

#### 6.2.1 AT+CGATT Attach or Detach from GPRS Service

| AT+CGATT Attach or Detach from GPRS Service |  |
|---|--|
| Test Command<br>AT+CGATT=?                  | <p>Response</p> <p>+CGATT: (list of supported &lt;state&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br>AT+CGATT?                   | <p>Response</p> <p>+CGATT: &lt;state&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CGATT=<state>           | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;state&gt;            Indicates the state of GPRS attachment</p> <p>0    Detached</p> <p>1    Attached</p> |

|                       |  |
|-----------------------|--|
|                       | Other values are reserved and will result in an ERROR response to the Write Command. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | 75 seconds   |
| Reference             | Note   |

## 6.2.2 AT+CGDCONT Define PDP Context

| AT+CGDCONT   | Define PDP Context  |
|--|---|
| Test Command<br>AT+CGDCONT=?   | <p>Response</p> <p>+CGDCONT: (range of supported &lt;cid&gt;s),&lt;PDP_type&gt;,,(list of supported &lt;d_comp&gt;s),(list of supported &lt;h_comp&gt;s)(list of &lt;ipv4_ctrl&gt;s),(list of &lt;emergency_flag&gt;s)</p> <p>OK</p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br>AT+CGDCONT?  | <p>Response</p> <p>+CGDCONT:<br/>[&lt;cid&gt;,&lt;PDP_type&gt;,&lt;APN&gt;,&lt;PDP_addr&gt;,&lt;d_comp&gt;,&lt;h_comp&gt;,&lt;ipv4_ctrl&gt;,&lt;emergency_flag&gt;[&lt;CR&gt;&lt;LF&gt;] +CGDCONT:<br/>&lt;cid&gt;,&lt;PDP_type&gt;,&lt;APN&gt;,&lt;PDP_addr&gt;,&lt;d_comp&gt;,&lt;h_comp&gt;,&lt;ipv4_ctrl&gt;,&lt;emergency_flag&gt;[...]]</p> <p>OK</p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<ipv4_ctrl>[,<emergency_flag>]]]]]]] | <p>Response</p> <p>OK</p> <p>or</p> <p>ERROR</p> <p>Parameters</p> <p>&lt;cid&gt; (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command.<br/>1...24</p> <p>&lt;PDP_type&gt; (Packet Data Protocol type) A string parameter which</p> |

|                       |   |
|-----------------------|---|
|                       | <p>specifies the type of packet data protocol.</p> <p>IP Internet Protocol (IETF STD 5)</p> <p>PPP Point to Point Protocol</p> <p>IPV6 Internet Protocol Version 6</p> <p>IPV4V6 Dual PDN Stack</p> <p><b>&lt;APN&gt;</b> (Access Point Name) A string parameter (string should be included in quotation marks) which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. The default value is NULL.</p> <p><b>&lt;PDP_addr&gt;</b> A string parameter that identifies the MT in the address space applicable to the PDP.<br/>Format: "&lt;n&gt;.&lt;n&gt;.&lt;n&gt;.&lt;n&gt;" where &lt;n&gt;=0..255<br/>If the value is null or equals 0.0.0.0 a dynamic address will be requested. The allocated address may be read using the +CGPADDR command.</p> <p><b>&lt;d_comp&gt;</b> A numeric parameter that controls PDP data compression</p> <ul style="list-style-type: none"> <li>0 Off (default if value is omitted)</li> <li>1 On</li> <li>2 V.42bis</li> </ul> <p><b>&lt;h_comp&gt;</b> A numeric parameter that controls PDP head compression</p> <ul style="list-style-type: none"> <li>0 Off (default if value is omitted)</li> <li>1 On</li> <li>2 RFC1144</li> <li>3 RFC2507</li> <li>4 RFC3095</li> </ul> <p><b>&lt;ipv4_ctrl&gt;</b> Parameter that controls how the MT/TA requests to get the IPv4 address information:</p> <ul style="list-style-type: none"> <li>0 Address Allocation through NAS Signaling</li> <li>1 on</li> </ul> <p><b>&lt;emergency_flag&gt;</b> Emergency_flag:</p> <ul style="list-style-type: none"> <li>0 Off (default if value is omitted)</li> <li>1 On</li> </ul> |
| Parameter Saving Mode | AUTO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note<br><cid> values 17 to 24 are supported from MPSS JO 1.0+ onwards.  |

### 6.2.3 AT+CGACT PDP Context Activate or Deactivate

#### AT+CGACT PDP Context Activate or Deactivate



|   |   |
|---|---|
| Test Command<br><b>AT+CGACT=?</b>   | Response<br><b>+CGACT:</b> (list of supported <state>s)<br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Read Command<br><b>AT+CGACT?</b>  | Response<br><b>+CGACT:</b> <cid>,<state>[<CR><LF>+CGACT: <cid>,<state>...]<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CGACT=&lt;state&gt;[,&lt;cid&gt;[,&lt;cid&gt;[,&lt;cid&gt;[,&lt;cid&gt;]]]</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;state&gt;</b> Indicates the state of PDP context activation<br>0 Deactivated<br>1 Activated<br>Other values are reserved and will result in an ERROR response to the Write Command.<br><b>&lt;cid&gt;</b> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT Command). If the <cid> is omitted, it only affects the first cid.<br><cid> values 17 to 24 are supported from MPSS JO 1.0+ onwards.<br>1...24 |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | 150 seconds   |
| Reference   | Note<br><ul style="list-style-type: none"> <li>This command is used to test PDPs with network simulators. Successful activation of PDP on real network is not guaranteed.</li> </ul>  |

#### 6.2.4 AT+CGPADDR Show PDP Address

| <b>AT+CGPADDR Show PDP Address</b>  |  |
|-------------------------------------|--|
| Test Command<br><b>AT+CGPADDR=?</b> | Response<br><b>+CGPADDR:</b> (list of defined <cid>s)<br><br><b>OK</b> |

|  |   |
|--|---|
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGPADDR=</b><br><b>&lt;cid&gt;[,&lt;cid&gt;[,...]</b><br><b>]</b> | Response<br><b>+CGPADDR: &lt;cid&gt;,&lt;PDP_addr&gt;</b><br><b>[&lt;CR&gt;&lt;LF&gt;+CGPADDR: &lt;cid&gt;,&lt;PDP_addr&gt;[...]]</b><br><br><b>OK</b><br><br>If SIM card supports IPV4V6 type and the PDP_type of the command "AT+CGDCONT" defined is ipv4v6 :<br><b>[+CGPADDR: &lt;cid&gt;,&lt;PDP_addr_IPV4&gt;,&lt;PDP_addr_IPV6&gt;]</b><br><b>+CGPADDR: &lt;cid&gt;,&lt;PDP_addr_IPV4&gt;,&lt;PDP_addr_IPV6&gt; [...]]</b><br><br><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;cid&gt;</b> A numeric parameter which specifies a particular PDP context definition (see +CGDCONT Command)<br>1...24<br><b>&lt;PDP_addr&gt;</b> String type, IP address<br>Format: <n>.<n>.<n>.<n> where <n>=0..255<br><b>&lt;PDP_addr_IPV4&gt;</b><br>A string parameter that identifies the MT in the address space applicable to the PDP.<br><b>&lt;PDP_addr_IPV6&gt;</b><br>A string parameter that identifies the MT in the address space applicable to the PDP when the sim_card supports ipv6.<br>The pdp type must be set to "ipv6" or "ipv4v6" by the AT+CGDCONT command. |
| Execution<br>Command<br><b>AT+CGPADDR</b>  | Response<br><b>[+CGPADDR: &lt;cid&gt;,&lt;PDP_addr&gt;] +CGPADDR:</b><br><b>&lt;cid&gt;,&lt;PDP_addr&gt;[...]]</b><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>If SIM card supports IPV4V6 type and the PDP_type of the command "AT+CGDCONT" defined is ipv4v6 :<br><b>[+CGPADDR: &lt;cid&gt;,&lt;PDP_addr_IPV4&gt;,&lt;PDP_addr_IPV6&gt;]</b><br><b>+CGPADDR: &lt;cid&gt;,&lt;PDP_addr_IPV4&gt;,&lt;PDP_addr_IPV6&gt; [...]]</b>   |

|                       |  |
|-----------------------|--|
|                       | <b>OK</b>  |
|                       | Parameters<br>See Write Command  |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note <ul style="list-style-type: none"> <li>● &lt;cid&gt; values 17 to 24 are supported from MPSS JO 1.0+ onwards.</li> <li>● Write command returns address provided by the network if a connection has been established.</li> </ul> |

### 6.2.5 AT+CGREG Network Registration Status

| AT+CGREG Network Registration Status         |  |
|--|--|
| Test Command<br><b>AT+CGREG=?</b>            | Response<br><b>+CGREG:</b> (list of supported <n>s)<br><br><b>OK</b><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CGREG?</b>             | Response<br><b>+CGREG:</b> <n>,<stat>[,<lac>,<ci>,<netact>],[<Active-Time>],[<Periodic-RAU>],[<GPRS-READY-timer>]]]<br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CGREG[=&lt;n&gt;]</b> | Response<br><b>OK</b><br><b>ERROR</b><br>Parameters<br><n>      0    Disable network registration unsolicited result code<br>1    Enable network registration unsolicited result code<br><b>+CGREG: &lt;stat&gt;</b><br>2    Enable network registration and location information unsolicited result code <b>+CGREG:</b><br><stat>[,<lac>,<ci>,<netact>]<br>4    Enable display gprs time and periodic RAU<br><b>&lt;stat&gt;</b><br>0    Not registered, MT is not currently searching an |

|                       |   |
|-----------------------|---|
|                       | <p>operator to register to. The GPRS service is disabled, the UE is allowed to attach for GPRS if requested by the user.</p> <ol style="list-style-type: none"> <li>1 Registered, home network.</li> <li>2 Not registered, but MT is currently trying to attach or searching an operator to register to. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.</li> <li>3 Registration denied, The GPRS service is disabled, the UE is not allowed to attach for GPRS if it is requested by the user.</li> <li>4 Unknown</li> <li>5 Registered, roaming</li> </ol> <p><b>&lt;lac&gt;</b> String type (string should be included in quotation marks); two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><b>&lt;ci&gt;</b> String type (string should be included in quotation marks); two bytes cell ID in hexadecimal format</p> <p><b>&lt;netact&gt;</b></p> <ol style="list-style-type: none"> <li>0 User-specified GSM access technology</li> <li>1 GSM compact</li> <li>3 GSM EGPRS</li> <li>7 User-specified LTE M1 A GB access technology</li> <li>9 User-specified LTE NB S1 access technology</li> </ol> <p><b>&lt;Active-Time&gt;</b></p> <p>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).</p> <p><b>&lt;Periodic-RAU&gt;</b></p> <p>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).</p> <p><b>&lt;GPRS-READY-timer&gt;</b></p> <p>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).</p> |
| Parameter Saving Mode | -   |

|                   |      |
|-------------------|------|
| Max Response Time | -    |
| Reference         | Note |

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

| AT+CGSMS Select Service for MO SMS Messages      |  |
|--|--|
| Test Command<br><b>AT+CGSMS=?</b>                | <p>Response</p> <p><b>+CGSMS:</b> (list of currently available &lt;service&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CGSMS?</b>                 | <p>Response</p> <p><b>+CGSMS:</b> &lt;service&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CGSMS=&lt;service&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;service&gt;</b> A numeric parameter which indicates the service or service preference to be used</p> <ul style="list-style-type: none"> <li>0 Packet Domain(value is not really supported and is internally mapped to 2)</li> <li><u>1</u> Circuit switched(value is not really supported and is internally mapped to 3)</li> <li>2 Packet Domain preferred (use circuit switched if GPRS not available)</li> <li>3 Circuit switched preferred (use Packet Domain if circuit switched not available)</li> </ul> |
| Parameter Saving Mode                            | AUTO_SAVE  |
| Max Response Time                                | -  |
| Reference  | Note   |

## 6.2.7 AT+CEREG EPS Network Registration Status

| AT+CEREG EPS Network Registration Status     |   |
|--|---|
| Test Command<br><b>AT+CEREG=?</b>            | Response<br><b>+CEREG:</b> (list of supported <n>s)<br><br><b>OK</b>  |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CEREG?</b>             | Response<br>when <n>=0, 1, 2 and command successful:<br><b>+CEREG: &lt;n&gt;,&lt;stat&gt;[,&lt;tac&gt;],[&lt;rac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;]]</b><br><br><b>OK</b><br>when <n>=4 and command successful:<br><b>+CEREG: &lt;n&gt;,&lt;stat&gt;[,&lt;tac&gt;],[&lt;rac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;][,],[&lt;Active-Time&gt;],[&lt;Periodic-TAU&gt;]]]</b><br><br><b>OK</b><br>If error is related to wrong AT syntax or operation not allowed:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CEREG[=&lt;n&gt;]</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><div> <div>&lt;n&gt;</div> <div> 0 Disable network registration unsolicited result code<br/> 1 Enable network registration unsolicited result code<br/> <b>+CEREG: &lt;stat&gt;</b><br/> 2 Enable network registration and location information unsolicited result code<br/> <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;rac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;]]</b><br/> 4 For a UE that wants to apply PSM, enable network registration and location information unsolicited result code<br/> <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;rac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;][,],[&lt;Active-Time&gt;],[&lt;Periodic-RAU&gt;]]]</b> </div> </div> <div> <div>&lt;stat&gt;</div> <div> 0 Not registered, MT is not currently searching an operator to register to. The GPRS service is disabled, the UE is allowed to attach for GPRS if requested by the user. </div> </div> |

|                       |   |
|-----------------------|---|
|                       | <p>1 Registered, home network.</p> <p>2 Not registered, but MT is currently trying to attach or searching an operator to register to. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.</p> <p>3 Registration denied, The GPRS service is disabled, the UE is not allowed to attach for GPRS if it is requested by the user.</p> <p>4 Unknown</p> <p>5 Registered, roaming</p> <p><b>&lt;taC&gt;</b> String type (string should be included in quotation marks); two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><b>&lt;ci&gt;</b> String type (string should be included in quotation marks); two bytes cell ID in hexadecimal format</p> <p><b>&lt;AcT&gt;</b></p> <ul style="list-style-type: none"> <li>0 User-specified GSM access technology</li> <li>7 User-specified LTE M1 A GB access technology</li> <li>9 User-specified LTE NB S1 access technology</li> </ul> <p><b>&lt;Active-Time&gt;</b></p> <p>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).</p> <p><b>&lt;Periodic-RAU&gt;</b></p> <p>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).</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | Note  |

## 7 AT Commands for IP Application

### 7.1 Overview

| Command  | Description                                  |
|----------|--|
| AT+SAPBR | Bearer settings for applications based on IP |

### 7.2 Detailed Descriptions of Commands

#### 7.2.1 AT+SAPBR Bearer Settings for Applications Based on IP

| AT+SAPBR Bearer Settings for Applications Based on IP                      |  |
|--|--|
| Test Command<br>AT+SAPBR=?   | <p>Response</p> <p>+SAPBR: (0-4),(1-3), "ConParamTag","ConParamValue"</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+SAPBR=<cmd_type>,<cid>[,<ConParamTag>,<ConParamValue>] | <p>Response</p> <p>OK</p> <p>If &lt;cmd_type&gt;=2</p> <p>+SAPBR: &lt;cid&gt;,&lt;Status&gt;,&lt;IP_Addr&gt;</p> <p>OK</p> <p>If &lt;cmd_type&gt;=4</p> <p>+SAPBR:</p> <p>&lt;ConParamTag&gt;,&lt;ConParamValue&gt;</p> <p>OK</p> <p>Unsolicited Result Code</p> <p>+SAPBR &lt;cid&gt;: DEACT</p> <p>Parameters</p> <p>&lt;cmd_type&gt;</p> <ul style="list-style-type: none"> <li>0 Close bearer</li> <li>1 Open bearer</li> <li>2 Query bearer</li> <li>3 Set bearer parameters</li> <li>4 Get bearer parameters</li> </ul> <p>&lt;cid&gt; Bearer profile identifier</p> <p>&lt;Status&gt;</p> |



|                       |   |
|-----------------------|---|
|                       | <p>0 Bearer is connecting<br/> 1 Bearer is connected<br/> 2 Bearer is closing<br/> 3 Bearer is closed</p> <p><b>&lt;ConParamTag&gt;</b> Bearer parameter</p> <p>"APN" Access point name string: maximum 64 characters<br/> "USER" User name string: maximum 32 characters<br/> "PWD" Password string: maximum 32 characters</p> <p><b>&lt;ConParamValue&gt;</b> Bearer parameter value</p> <p><b>&lt;IP_Addr&gt;</b> The IP address of bearer</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | <p>When <b>&lt;cmd_type&gt;</b> is 1, 85 seconds<br/> When <b>&lt;cmd_type&gt;</b> is 0, 65 seconds</p>   |
| Reference             | <p>Note</p> <p>This command is applied to activate some applications such as HTTP, FTP.</p>   |

## 8 AT Commands for TCPIP Application Toolkit

### 8.1 Overview

| Command       | Description   |
|---------------|---|
| AT+CIPMUX     | Start up multi-IP connection                            |
| AT+CIPSTART   | Start up TCP or UDP connection                          |
| AT+CIPSEND    | Send data through TCP or UDP connection                 |
| AT+CIPQSEND   | Select data transmitting mode                           |
| AT+CIPACK     | Query previous connection data transmitting state       |
| AT+CIPCLOSE   | Close TCP or UDP connection                             |
| AT+CIPSHUT    | Deactivate GPRS PDP context                             |
| AT+CLPORT     | Set local port  |
| AT+CSTT       | Start task and set APN, user name, password             |
| AT+CIICR      | Bring up wireless connection with GPRS                  |
| AT+CIFSR      | Get local IP address                                    |
| AT+CIFSREX    | Get Local IP Address extend                             |
| AT+CIPSTATUS  | Query current connection status                         |
| AT+CDNSCFG    | Configure domain name server                            |
| AT+CDNSGIP    | Query the IP address of given domain name               |
| AT+CIPHEAD    | Add an IP head at the beginning of a package received   |
| AT+CIPATS     | Set auto sending timer                                  |
| AT+CIPSPRT    | Set prompt of '>' when module sends data                |
| AT+CIPSERVER  | Configure module as server                              |
| AT+CIPCSGP    | Set GPRS for connection mode                            |
| AT+CIPSRIP    | Show remote IP address and port when received data      |
| AT+CIPDPDP    | Set whether to check state of GPRS network timing       |
| AT+CIPMODE    | Select TCPIP application mode                           |
| AT+CIPCCFG    | Configure transparent transfer mode                     |
| AT+CIPSHOWTP  | Display transfer protocol in IP head when received data |
| AT+CIPUDPMODE | UDP extended mode                                       |
| AT+CIPRXGET   | Get data from network manually                          |
| AT+CIPRDTIMER | Set remote delay timer                                  |

|               |                                       |
|---------------|---------------------------------------|
| AT+CIPSGTXT   | Select GPRS PDP context               |
| AT+CIPSENDHEX | Set CIPSEND Data Format to HEX        |
| AT+CIPHEXS    | Set Output-data Format with suffix    |
| AT+CIPTKA     | Set TCP keepalive parameters          |
| AT+CIPOPTION  | Enable or Disable TCP nagle algorithm |

## 8.2 Detailed Descriptions of Commands

### 8.2.1 AT+CIPMUX Start Up Multi-IP Connection

| AT+CIPMUX Start Up Multi-IP Connection |  |
|--|--|
| Test Command<br>AT+CIPMUX=?            | Response<br><b>+CIPMUX: (0,1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br>AT+CIPMUX?             | Response<br><b>+CIPMUX: &lt;n&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CIPMUX=<n>         | Response<br><b>OK</b><br><br>Parameters<br><n>    0    Single IP connection<br>1    Multi IP connection  |
| Parameter Saving Mode                  | NO_SAVE  |
| Max Response Time                      | -  |
| Reference                              | Note <ul style="list-style-type: none"> <li>Only in IP initial state, <b>AT+CIPMUX=1</b> is effective;</li> <li>Only when multi IP connection and GPRS application are both shut down, <b>AT+CIPMUX=0</b> is effective.</li> </ul> |

### 8.2.2 AT+CIPSTART Start Up TCP or UDP Connection

| AT+CIPSTART Start Up TCP or UDP Connection |          |
|--|----------|
| Test Command                               | Response |

|  |   |
|--|---|
| <p><b>AT+CIPSTART=?</b></p>  | <p>1) If AT+CIPMUX=0<br/> <b>+CIPSTART:</b> (list of supported &lt;mode&gt;),( &lt;IP address&gt;),( &lt;port&gt;)<br/> <b>+CIPSTART:</b> (list of supported &lt;mode&gt;),( &lt;domain name&gt;),( &lt;port&gt;)</p> <p><b>OK</b></p> <p>2) If AT+CIPMUX=1<br/> <b>+CIPSTART:</b> (list of supported &lt;n&gt;),(list of supported &lt;mode&gt;),( &lt;IP address&gt;),( &lt;port&gt;)<br/> <b>+CIPSTART:</b> (list of supported &lt;n&gt;),(list of supported &lt;mode&gt;),( &lt;domain name&gt;),( &lt;port&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/> See Write Command</p>  |
| <p>Write Command</p> <p>1)If single IP connection<br/> (+CIPMUX=0)<br/> <b>AT+CIPSTART=&lt;mode&gt;,&lt;IP address&gt;,&lt;port&gt;</b><br/> Or<br/> <b>AT+CIPSTART=&lt;mode&gt;,&lt;domain name&gt;,&lt;port&gt;</b></p> <p>2)If multi-IP connection<br/> (+CIPMUX=1)<br/> <b>AT+CIPSTART=&lt;n&gt;,&lt;mode&gt;,&lt;address&gt;,&lt;port&gt;</b><br/> <b>AT+CIPSTART=&lt;n&gt;,&lt;mode&gt;,&lt;domain name&gt;,&lt;port&gt;</b></p> | <p>Response</p> <p>1)If single IP connection (+CIPMUX=0)<br/> If format is right response<br/> <b>OK</b><br/> otherwise response<br/> If error is related to ME functionality:<br/> <b>+CME ERROR &lt;err&gt;</b><br/> Response when connection exists<br/> <b>ALREADY CONNECT</b><br/> Response when connection is successful<br/> <b>CONNECT OK</b><br/> Otherwise<br/> <b>STATE: &lt;state&gt;</b></p> <p><b>CONNECT FAIL</b></p> <p>2)If multi-IP connection<br/> (+CIPMUX=1)<br/> If format is right<br/> <b>OK</b>,<br/> otherwise response<br/> If error is related to ME functionality:<br/> <b>+CME ERROR &lt;err&gt;</b><br/> Response when connection exists<br/> &lt;n&gt;,<b>ALREADY CONNECT</b><br/> If connection is successful<br/> &lt;n&gt;,<b>CONNECT OK</b><br/> Otherwise<br/> &lt;n&gt;,<b>CONNECT FAIL</b></p> <p>Parameters</p> |

|                       |  |
|-----------------------|--|
|                       | <p><b>&lt;n&gt;</b> 0..7 A numeric parameter which indicates the connection number</p> <p><b>&lt;mode&gt;</b> A string parameter which indicates the connection type</p> <p>"TCP" Establish a TCP connection</p> <p>"UDP" Establish a UDP connection</p> <p><b>&lt;IP address&gt;</b> A string parameter which indicates remote server IP address</p> <p><b>&lt;port&gt;</b> Remote server port</p> <p><b>&lt;domain name&gt;</b> A string parameter which indicates remote server domain name</p> <p><b>&lt;state&gt;</b> A string parameter which indicates the progress of connecting</p> <p>0 IP INITIAL</p> <p>1 IP START</p> <p>2 IP CONFIG</p> <p>3 IP GPRSACT</p> <p>4 IP STATUS</p> <p>5 TCP CONNECTING/UDP CONNECTING/<br/>SERVER LISTENING</p> <p>6 CONNECT OK</p> <p>7 TCP CLOSING/UDP CLOSING</p> <p>8 TCP CLOSED/UDP CLOSED</p> <p>9 PDP DEACT</p> <p>In Multi-IP state:</p> <p>0 IP INITIAL</p> <p>1 IP START</p> <p>2 IP CONFIG</p> <p>3 IP GPRSACT</p> <p>4 IP STATUS</p> <p>5 IP PROCESSING</p> <p>9 PDP DEACT</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | <p>When mode is multi-IP state, the max response time 75 seconds.</p> <p>When mode is single state, and the state is IP INITIAL, the max response time is 160 seconds.</p>   |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>This command allows establishment of a TCP/UDP connection only when the state is IP INITIAL or IP STATUS when it is in single state. In multi-IP state, the state is in IP STATUS only. So it is necessary to process "AT+CIPSHUT" before user establishes a TCP/UDP connection with this command when the state is not IP INITIAL or IP STATUS.</li> <li>When module is in multi-IP state, before this command is executed, it is necessary to process "AT+CSTT, AT+CIICR, AT+CIFSR".</li> </ul>   |

### 8.2.3 AT+CIPSEND Send Data Through TCP or UDP Connection

| AT+CIPSEND Send Data Through TCP or UDP Connection   |   |
|--|---|
| Test Command<br><b>AT+CIPSEND=?</b>  | <p>Response</p> <p>1) For single IP connection (+CIPMUX=0)<br/><b>+CIPSEND: &lt;length&gt;</b></p> <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)<br/><b>+CIPSEND: (0-7),&lt;length&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br><b>AT+CIPSEND?</b>   | <p>Response</p> <p>1) For single IP connection (+CIPMUX=0)<br/><b>+CIPSEND: &lt;size&gt;</b></p> <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)<br/><b>+CIPSEND: &lt;n&gt;,&lt;size&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/> <b>&lt;n&gt;</b> A numeric parameter which indicates the connection number<br/> <b>&lt;size&gt;</b> A numeric parameter which indicates the data length sent at a time </p>   |
| Write Command<br>1) If single IP connection<br>(+CIPMUX=0)<br><b>AT+CIPSEND=&lt;length&gt;</b><br>2) If multi IP connection<br>(+CIPMUX=1)<br><b>AT+CIPSEND=&lt;n&gt;[,&lt;length&gt;]</b> | <p>Response</p> <p>This Command is used to send changeable length data</p> <p>If single IP is connected (+CIPMUX=0)<br/>If connection is not established or module is disconnected:<br/>If error is related to ME functionality:<br/><b>+CME ERROR &lt;err&gt;</b></p> <p>If sending is successful:<br/>When +CIPQSEND=0<br/><b>SEND OK</b><br/>When +CIPQSEND=1<br/><b>DATA ACCEPT: &lt;length&gt;</b></p> <p>If sending fails:<br/><b>SEND FAIL</b></p> <p>If multi IP connection is established (+CIPMUX=1)<br/>If connection is not established or module is disconnected:<br/>If error is related to ME functionality:<br/><b>+CME ERROR &lt;err&gt;</b></p> |

|   |   |
|---|---|
|   | <p>If sending is successful:<br/>When +CIPQSEND=0<br/><b>&lt;n&gt;,SEND OK</b><br/>When +CIPQSEND=1<br/><b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b><br/>If sending fails:<br/><b>&lt;n&gt;,SEND FAIL</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b>            A numeric parameter which indicates the connection number</p> <p><b>&lt;length&gt;</b>      A numeric parameter which indicates the length of sending data, it must be less than &lt;size&gt;</p>  |
| <p>Execution<br/>Command<br/><b>AT+CIPSEND</b><br/>Response "&gt;",<br/>then type data for<br/>send,tap CTRL+Z<br/>to send, tap ESC<br/>to cancel the<br/>operation</p> | <p>Response</p> <p>This Command is used to send changeable length data.</p> <p>If single IP connection is established (+CIPMUX=0)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality:<br/><b>+CME ERROR &lt;err&gt;</b></p> <p>If sending is successful:<br/>When +CIPQSEND=0<br/><b>SEND OK</b><br/>When +CIPQSEND=1<br/><b>DATA ACCEPT: &lt;length&gt;</b><br/>If sending fails:<br/><b>SEND FAIL</b></p> <p>Note</p> <p>This Command can only be used in single IP connection mode (+CIPMUX=0) and to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol. ESC is used to cancel sending data. There are at most &lt;size&gt; bytes which can be sent at a time.</p> |
| <p>Parameter Saving<br/>Mode</p>  | <p>NO_SAVE</p>  |
| <p>Max      Response<br/>Time</p>   | <p>When +CIPQSEND=0 and the remote server no response, after 645 seconds, "CLOSE" will be reported.</p>   |
| <p>Reference</p>  | <p>Note</p> <ul style="list-style-type: none"> <li>● The data length which can be sent depends on network status.</li> <li>● Set the time that send data automatically with the Command of AT+CIPATS.</li> <li>● Only send data at the status of established connection.</li> </ul>   |

## 8.2.4 AT+CIPQSEND Select Data Transmitting Mode

| AT+CIPQSEND Select Data Transmitting Mode     |  |
|---|--|
| Test Command<br><b>AT+CIPQSEND=?</b>          | Response<br><b>+CIPQSEND: (0,1)</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command  |
| Read Command<br><b>AT+CIPQSEND?</b>           | Response<br><b>+CIPQSEND: &lt;n&gt;</b><br><br><b>OK</b>   |
|   | Parameter<br>See Write Command   |
| Write Command<br><b>AT+CIPQSEND=&lt;n&gt;</b> | Response<br><b>OK</b>  |
|   | Parameters<br><n>     0   Normal mode – when the server receives TCP data, it will respond SEND OK.<br>1   Quick send mode – when the data is sent to module, it will respond DATA ACCEPT: <n>,<length>, while not responding SEND OK. |
| Parameter Saving Mode                         | NO_SAVE  |
| Max Response Time                             | -  |
| Reference                                     | Note   |

## 8.2.5 AT+CIPACK Query Previous Connection Data Transmitting State

| AT+CIPACK Query Previous Connection Data Transmitting State                             |   |
|---|---|
| Test Command<br><b>AT+CIPACK=?</b>  | Response<br><b>OK</b>   |
| Write Command<br>If in multi IP connection<br>(+CIPMUX=1)<br><b>AT+CIPACK=&lt;n&gt;</b> | Response<br><b>+CIPACK: &lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b><br><br><b>OK</b>   |
|   | Parameters<br><n>            A numeric parameter which indicates the connection number<br><txlen>       The data amount which has been sent<br><acklen>      The data amount confirmed successfully by the server<br><nacklen>     The data amount without confirmation by the server |



|  |  |
|--|--|
| Execution Command                      | Response   |
| If in single IP connection (+CIPMUX=0) | <b>+CIPACK: &lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b> |
| <b>AT+CIPACK</b>                       | <b>OK</b>  |
| Parameter Saving Mode                  | Parameters   |
|  | See Write Command  |
| Max Response Time                      | -  |
| Reference                              | Note   |

### 8.2.6 AT+CIPCLOSE Close TCP or UDP Connection

| <b>AT+CIPCLOSE</b>                      | <b>Close TCP or UDP Connection</b>  |
|---|---|
| Test Command                            | Response  |
| <b>AT+CIPCLOSE=?</b>                    | <b>OK</b>   |
| Write Command                           | Response:   |
| 1) If single IP connection (+CIPMUX=0)  | 1) For single IP connection (+CIPMUX=0)<br><b>CLOSE OK</b>  |
| (+CIPMUX=0)                             | 2) For multi IP connection (+CIPMUX=1)<br><b>&lt;id&gt;,&lt;CLOSE OK</b>  |
| <b>AT+CIPCLOSE=&lt;n&gt;</b>            | Parameters  |
| 2) If multi IP connection (+CIPMUX=1)   | <b>&lt;n&gt;</b> <u>0</u> Slow close<br>1   Quick close   |
| <b>AT+CIPCLOSE=&lt;id&gt;,&lt;n&gt;</b> | <b>&lt;id&gt;</b> A numeric parameter which indicates the connection number   |
| Execution Command                       | Response  |
| <b>AT+CIPCLOSE</b>                      | If close is successfully:<br><b>CLOSE OK</b>  |
|   | If close fails:<br><b>ERROR</b>   |
| Parameter Saving Mode                   | NO_SAVE   |
| Max Response Time                       | -   |
| Reference                               | Note  |
|   | AT+CIPCLOSE only closes connection at corresponding status of TCP/UDP stack. To see the status use AT+CIPSTATUS command. Status |

|  |  |
|--|--|
|  | <p>should be:</p> <p>TCP CONNECTING, UDP CONNECTING, SERVER LISTENING or CONNECT OK in single-connection mode (see &lt;state&gt; parameter);</p> <p>CONNECTING or CONNECTED in multi-connection mode (see &lt;client state&gt;);</p> <p>OPENING or LISTENING in multi-connection mode (see &lt;server state&gt;).</p> <p>Otherwise it will return "ERROR".</p> |
|--|--|

### 8.2.7 AT+CIPSHUT Deactivate GPRS PDP Context

| AT+CIPSHUT Deactivate GPRS PDP Context |  |
|--|--|
| Test Command<br><b>AT+CIPSHUT=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CIPSHUT</b> | <p>Response</p> <p>If close is successful:</p> <p><b>SHUT OK</b></p> <p>If close fails:</p> <p><b>ERROR</b></p>  |
| Parameter Saving Mode                  | NO_SAVE  |
| Max Response Time                      | 65 seconds   |
| Reference                              | <p>Note</p> <ul style="list-style-type: none"> <li>● If this command is executed in multi-connection mode, all of the IP connection will be shut.</li> <li>● User can close gprs pdp context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.</li> <li>● If "+PDP: DEACT" ure is reported which means the gprs is released by the network, then user still needs to execute "AT+CIPSHUT" command to make PDP context come back to original state.</li> </ul> |

### 8.2.8 AT+CLPORT Set Local Port

| AT+CLPORT Set Local Port           |  |
|------------------------------------|--|
| Test Command<br><b>AT+CLPORT=?</b> | <p>Response</p> <p>1) For single IP connection (+CIPMUX=0)</p> <p><b>+CLPORT: ("TCP","UDP"),(0-65535)</b></p> <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)</p> <p><b>+CLPORT: (0-7),("TCP","UDP"),(0-65535)</b></p> <p><b>OK</b></p> |

|  |  |
|--|--|
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+CLPORT?</b>  | Response<br>1) For single IP connection (+CIPMUX=0)<br><b>+CLPORT: &lt;TCP port&gt;,&lt;UDP port&gt;</b><br><br><b>OK</b><br>2) For multi IP connection (+CIPMUX=1)<br><b>+CLPORT: 0,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 1,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 2,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 3,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 4,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 5,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 6,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><b>+CLPORT: 7,&lt;TCP port&gt;,&lt;UDP port&gt;</b><br><br><b>OK</b> |
|  | Parameters<br>See Write Command  |
| Write Command<br>1) For single IP connection<br>(+CIPMUX=0)<br><b>AT+CLPORT=&lt;n&gt;,&lt;mode&gt;,&lt;port&gt;</b><br>2) For multi IP connection<br>(+CIPMUX=1)<br><b>AT+CLPORT=&lt;n&gt;,&lt;mode&gt;,&lt;port&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b>  |
|  | Parameters<br><b>&lt;n&gt;</b> 0..7 A numeric parameter which indicates the connection number this used in multi IP connection<br><b>&lt;mode&gt;</b> A string parameter which indicates the connection type<br>"TCP" TCP local port<br>"UDP" UDP local port<br><b>&lt;port&gt;</b> 0-65535 A numeric parameter which indicates the local port. Default value is 0, a port can be dynamically allocated a port.  |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note<br>This command will be effective when module is set as a Client.   |

### 8.2.9 AT+CSTT Start Task and Set APN, USER NAME, PASSWORD

#### AT+CSTT Start Task and Set APN, USER NAME, PASSWORD

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

|   |   |
|---|---|
| AT+CSTT=?   | +CSTT: "APN","USER","PWD"   |
|   | OK  |
|   | Parameters<br>See Write Command   |
| Read Command<br>AT+CSTT?                              | Response<br>+CSTT: <apn>,<user name>,<password>   |
|   | OK  |
|   | Parameters<br>See Write Command   |
| Write Command<br>AT+CSTT=<apn>,<user name>,<password> | Response<br>OK<br>ERROR   |
|   | Parameters<br><apn> A string parameter which indicates the GPRS access point name. The max length is 50 bytes.Default value is "CMNET".<br><user name> A string parameter which indicates the GPRS user name. The max length is 50 bytes.<br><password> A string parameter which indicates the GPRS password. The max length is 50 bytes. |
| Parameter Saving Mode                                 | NO_SAVE   |
| Max Response Time                                     | -   |
| Execution Command<br>AT+CSTT                          | Response<br>OK<br>ERROR   |
| Reference   | Note<br>The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed, the state will be changed to IP START.  |

### 8.2.10 AT+CIICR Bring Up Wireless Connection with GPRS

| AT+CIICR Bring Up Wireless Connection with GPRS |                         |
|---|-------------------------|
| Test Command<br>AT+CIICR=?                      | Response<br>OK          |
| Execution Command<br>AT+CIICR                   | Response<br>OK<br>ERROR |
| Parameter Saving                                | NO_SAVE                 |

|                   |  |
|-------------------|--|
| Mode              |  |
| Max Response Time | 85 seconds   |
| Reference         | <p>Note</p> <ul style="list-style-type: none"> <li>● AT+CIICR only activates moving scene at the status of IP START, after operating this Command is executed, the state will be changed to IP CONFIG.</li> <li>● After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respond ERROR.</li> </ul> |

### 8.2.11 AT+CIFSR Get Local IP Address

| AT+CIFSR Get Local IP Address        |  |
|--------------------------------------|--|
| Test Command<br><b>AT+CIFSR=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CIFSR</b> | Response<br><b>&lt;IP address&gt;</b><br><b>ERROR</b>  |
|                                      | Parameter<br><b>&lt;IP address&gt;</b> A string parameter which indicates the IP address assigned from GPRS  |
| Parameter Saving Mode                | NO_SAVE  |
| Max Response Time                    | -  |
| Reference                            | <p>Note</p> <p>Only after PDP context is activated, local IP address can be obtained by AT+CIFSR, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be:</p> <p>IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see &lt;state&gt; parameter);</p> <p>IP STATUS, IP PROCESSING in multi-connection mode (see &lt;state&gt; parameter).</p> |

### 8.2.12 AT+CIFSREX Get Local IP Address extend

| AT+CIFSREX Get Local IP Address extend |                       |
|--|-----------------------|
| Test Command<br><b>AT+CIFSREX=?</b>    | Response<br><b>OK</b> |
| Execution                              | Response              |

|                              |   |
|------------------------------|---|
| Command<br><b>AT+CIFSREX</b> | <b>+CIFSREX: &lt;IP address&gt;</b><br><br><b>OK</b>  |
|                              | Parameter<br><b>&lt;IP address&gt;</b> A string parameter which indicates the IP address assigned from GPRS   |
| Parameter Saving Mode        | NO_SAVE   |
| Max Response Time            | -   |
| Reference                    | Note<br>Only after PDP context is activated, local IP address can be obtained by AT+CIPSR, otherwise it will respond ERROR. To see the status use AT+CIPSTATUS command. Status should be:<br>IP GPRSACT, TCP CONNECTING, UDP CONNECTING, SERVER LISTENING, IP STATUS, CONNECT OK, TCP CLOSING, UDP CLOSING, TCP CLOSED, UDP CLOSED in single-connection mode (see <state> parameter);<br>IP STATUS, IP PROCESSING in multi-connection mode (see <state> parameter). |

### 8.2.13 AT+CIPSTATUS Query Current Connection Status

| <b>AT+CIPSTATUS Query Current Connection Status</b>   |  |
|---|--|
| Test Command<br><b>AT+CIPSTATUS=?</b>   | Response<br><b>OK</b>  |
| Write Command<br>If multi IP connection mode (+CIPMUX=1)<br><b>AT+CIPSTATUS=S=&lt;n&gt;</b> | Response<br><b>+CIPSTATUS: &lt;n&gt;,&lt;bearer&gt;,&lt;TCP/UDP&gt;,&lt;IP address&gt;,&lt;port&gt;,&lt;client state&gt;</b><br><br><b>OK</b>                      |
|   | Parameters<br>See Execution Command  |
| Execution Command<br><b>AT+CIPSTATUS</b>  | Response<br>1) If in single connection mode (+CIPMUX=0)<br><b>OK</b><br><br><b>STATE: &lt;state&gt;</b><br>2) If in multi-connection mode (+CIPMUX=1)<br><b>OK</b> |

|                       |   |
|-----------------------|---|
|                       | <p><b>STATE: &lt;state&gt;</b><br/>If the module is set as server</p> <p><b>S: 0,&lt;bearer&gt;,&lt;port&gt;,&lt;server state&gt;</b></p> <p><b>C: &lt;n&gt;,&lt;bearer&gt;,&lt;TCP/UDP&gt;,&lt;IP address&gt;,&lt;port&gt;,&lt;client state&gt;</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> 0-7 A numeric parameter which indicates the connection number</p> <p><b>&lt;bearer&gt;</b> 0-1 GPRS bearer, default is 0</p> <p><b>&lt;server state&gt;</b> OPENING<br/>LISTENING<br/>CLOSING</p> <p><b>&lt;client state&gt;</b> INITIAL<br/>CONNECTING<br/>CONNECTED<br/>REMOTE CLOSING<br/>CLOSING<br/>CLOSED</p> <p><b>&lt;state&gt;</b> A string parameter which indicates the progress of connecting</p> <p>0 IP INITIAL<br/>1 IP START<br/>2 IP CONFIG<br/>3 IP GPRSACT<br/>4 IP STATUS<br/>5 TCP CONNECTING/UDP CONNECTING /SERVER LISTENING<br/>6 CONNECT OK<br/>7 TCP CLOSING/UDP CLOSING<br/>8 TCP CLOSED/UDP CLOSED<br/>9 PDP DEACT</p> <p>In Multi-IP state:</p> <p>0 IP INITIAL<br/>1 IP START<br/>2 IP CONFIG<br/>3 IP GPRSACT<br/>4 IP STATUS<br/>5 IP PROCESSING<br/>9 PDP DEACT</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

#### 8.2.14 AT+CDNSCFG Configure Domain Name Server

| AT+CDNSCFG Configure Domain Name Server                              |   |
|--|---|
| Test Command<br><b>AT+CDNSCFG=?</b>                                  | <p>Response<br/><b>+CDNSCFG: ("Primary DNS"),("Secondary DNS")</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br><b>AT+CDNSCFG?</b>                                   | <p>Response<br/><b>PrimaryDns: &lt;pri_dns&gt;</b><br/><b>SecondaryDns: &lt;sec_dns&gt;</b></p> <p><b>OK</b></p> <p>Parameter<br/>See Write Command</p>   |
| Write Command<br><b>AT+CDNSCFG=&lt;pri_dns&gt;[,&lt;sec_dns&gt;]</b> | <p>Response<br/><b>OK</b><br/><b>ERROR</b></p> <p>Parameters<br/> <b>&lt;pri_dns&gt;</b> A string parameter which indicates the IP address of the primary domain name server. Default value is 0.0.0.0.<br/> <b>&lt;sec_dns&gt;</b> A string parameter which indicates the IP address of the secondary domain name server. Default value is 0.0.0.0. </p> |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note  |

#### 8.2.15 AT+CDNSGIP Query the IP Address of Given Domain Name

| AT+CDNSGIP Query the IP Address of Given Domain Name   |  |
|--|--|
| Test Command<br><b>AT+CDNSGIP=?</b>                    | <p>Response<br/><b>OK</b></p>  |
| Write Command<br><b>AT+CDNSGIP=&lt;domain name&gt;</b> | <p>Response<br/><b>OK</b><br/><b>ERROR</b></p> <p>If successful, return:</p> |



|                       |  |
|-----------------------|--|
|                       | <b>+CDNSGIP: 1,&lt;domain name&gt;,&lt;IP1&gt;[,&lt;IP2&gt;]</b><br>If fail, return:<br><b>+CDNSGIP:0,&lt;dns error code&gt;</b><br>Parameters<br><b>&lt;domain name&gt;</b> A string parameter which indicates the domain name<br><b>&lt;IP1&gt;</b> A string parameter which indicates the first IP address corresponding to the domain name<br><b>&lt;IP2&gt;</b> A string parameter which indicates the second IP address corresponding to the domain name<br><b>&lt;dns error code&gt;</b> A numeric parameter which indicates the error code<br>8 DNS COMMON ERROR<br>3 NETWORK ERROR<br>There are some other error codes as well. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

#### 8.2.16 AT+CIPHEAD Add an IP Head at the Beginning of a Package Received

| AT+CIPHEAD Add an IP Head at the Beginning of a Package Received |  |
|--|--|
| Test Command<br><b>AT+CIPHEAD=?</b>                              | Response<br><b>+CIPHEAD: (list of supported &lt;mode&gt;s)</b><br><br><b>OK</b>  |
|  | Parameter<br>See Write Command   |
| Read Command<br><b>AT+CIPHEAD?</b>                               | Response<br><b>+CIPHEAD: &lt;mode&gt;</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPHEAD=&lt;mode&gt;</b>                  | Response<br><b>OK</b><br><b>ERROR</b>  |
|  | Parameters<br><b>&lt;mode&gt;</b> A numeric parameter which indicates whether an IP header is added to the received data or not.<br>0 Not add IP header<br>1 Add IP header, the format is: |

|                       |   |
|-----------------------|---|
|                       | 1) For single IP connection (+CIPMUX=0)<br><b>+IPD,&lt;data length&gt;:</b><br>2) For multi IP connection (+CIPMUX=1)<br><b>+RECEIVE,&lt;n&gt;,&lt;data length&gt;:</b> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

### 8.2.17 AT+CIPATS Set Auto Sending Timer

| AT+CIPATS Set Auto Sending Timer                              |   |
|---|---|
| Test Command<br><b>AT+CIPATS=?</b>                            | Response<br><b>+CIPATS:</b> (list of supported <b>&lt;mode&gt;s</b> ),(list of supported <b>&lt;time&gt;</b> )<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CIPATS?</b>                             | Response<br><b>+CIPATS:</b> <b>&lt;mode&gt;</b> , <b>&lt;time&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPATS=&lt;mode&gt;[,&lt;time&gt;]</b> | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b> A numeric parameter which indicates whether set timer when module is sending data<br>0    Not set timer when module is sending data<br>1    Set timer when module is sending data<br><b>&lt;time&gt;</b> 1..100    A numeric parameter which indicates the seconds after which the data will be sent |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

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

| AT+CIPSPRT Set Prompt of '>' When Module Sends Data    |   |
|--|---|
| Test Command<br><b>AT+CIPSPRT=?</b>                    | Response<br><b>+CIPSPRT: (list of supported &lt;send prompt&gt;s)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Read Command<br><b>AT+CIPSPRT?</b>                     | Response<br><b>+CIPSPRT: &lt;send prompt&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPSPRT=&lt;send prompt&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;send prompt&gt;</b> A numeric parameter which indicates whether to echo prompt '>' after module issues AT+CIPSEND command.<br>0 It shows "send ok" but does not prompt echo '>' when sending is successful.<br>1 It prompts echo '>' and shows "send ok" when sending is successful.<br>2 It neither prompts echo '>' nor shows "send ok" when sending is successful. |
| Parameter Saving Mode                                  | NO_SAVE   |
| Max Response Time                                      | -   |
| Reference  | Note  |

## 8.2.19 AT+CIPSERVER Configure Module as Server

| AT+CIPSERVER Configure Module as Server |  |
|---|--|
| Test Command<br><b>AT+CIPSERVER=?</b>   | Response<br><b>+CIPSERVER: (0-CLOSE SERVER, 1-OPEN SERVER),(1-65535)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |

|  |   |
|--|---|
| Read Command<br><b>AT+CIPSERVER?</b>                             | Response<br><b>+CIPSERVER: &lt;mode&gt;[,&lt;port&gt;,&lt;channel id&gt;,&lt;bearer&gt;]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPSERVER=&lt;mode&gt;[,&lt;port&gt;]</b> | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b> 0    Close server<br>1    Open server<br><b>&lt;port&gt;</b> 1..65535    Listening port<br><b>&lt;channel id&gt;</b> Channel id<br><b>&lt;bearer&gt;</b> GPRS bearer |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note<br>This command is allowed to establish a TCP server only when the state is IP INITIAL or IP STATUS when it is in single state. In multi-IP state, the state is in IP STATUS only.   |

### 8.2.20 AT+CIPCSGP Set GPRS for Connection Mode

| <b>AT+CIPCSGP Set GPRS for Connection Mode</b>                     |   |
|--|---|
| Test Command<br><b>AT+CIPCSGP=?</b>                                | Response<br><b>+CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CIPCSGP?</b>                                 | Response<br><b>+CIPCSGP: &lt;mode&gt;,&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;[,&lt;rate&gt;]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+CIPCSGP=&lt;mode&gt;[,(&lt;apn&gt;,&lt;</b> | Response<br><b>OK</b><br><b>ERROR</b>   |

|  |  |
|--|--|
| <b>user name&gt;,<br/>&lt;password&gt;)]</b> | Parameters<br><b>&lt;mode&gt;</b> A numeric parameter which indicates the wireless connection mode<br><u>1</u> set GPRS as wireless connection mode<br><b>&lt;apn&gt;</b> A string parameter which indicates the access point name<br><b>&lt;user name&gt;</b> A string parameter which indicates the user name<br><b>&lt;password&gt;</b> A string parameter which indicates the password |
| Parameter Saving Mode                        | NO_SAVE  |
| Max Response Time                            | -  |
| Reference                                    | Note   |

### 8.2.21 AT+CIPSRIP Show Remote IP Address and Port When Received Data

| AT+CIPSRIP Show Remote IP Address and Port When Received Data |   |
|---|---|
| Test Command<br><b>AT+CIPSRIP=?</b>                           | Response<br><b>+CIPSRIP: (list of supported &lt;mode&gt;s)</b><br><br><b>OK</b><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CIPSRIP?</b>                            | Response<br><b>+CIPSRIP: &lt;mode&gt;</b><br><br><b>OK</b><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPSRIP=&lt;mode&gt;</b>               | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b> A numeric parameter which shows remote IP address and port.<br><u>0</u> Do not show the prompt<br><u>1</u> Show the prompt, the format is as follows:<br>1) For single IP connection (+CIPMUX=0)<br><b>RCV FROM:&lt;IP ADDRESS&gt;:&lt;PORT&gt;</b><br>1) For multi IP connection (+CIPMUX=1)<br><b>+RECEIVE,&lt;n&gt;,&lt;data length&gt;,&lt;IP ADDRESS&gt;:&lt;PORT&gt;</b> |
| Parameter Saving Mode   | NO_SAVE   |

|                   |   |
|-------------------|---|
| Max Response Time | - |
| Reference         |   |

### 8.2.22 AT+CIPDPPD Set Whether to Check State of GPRS Network Timing

| AT+CIPDPPD Set Whether to Check State of GPRS Network Timing                     |  |
|--|--|
| Test Command<br><b>AT+CIPDPPD=?</b>  | <p>Response</p> <p><b>+CIPDPPD:</b> (list of supported&lt;mode&gt;s, list of supported &lt;interval&gt;, list of supported &lt;timer&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br><b>AT+CIPDPPD?</b>   | <p>Response</p> <p><b>+CIPDPPD:</b> &lt;mode&gt;,&lt;interval&gt;,&lt;timer&gt;</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+CIPDPPD=&lt;mode&gt;[,&lt;interval&gt;,&lt;timer&gt;]</b> | <p>Response</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b></p> <p>0 Not set detect PDP</p> <p>1 Set detect PDP</p> <p><b>&lt;interval&gt;</b></p> <p>1&lt;=interval&lt;=180(s), default value is 10.</p> <p><b>&lt;timer&gt;</b></p> <p>1&lt;=timer&lt;=10, default value is 3.</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | <p>Note</p> <p>If "+PDP: DEACT" urc is reported because of module not attaching to gprs for a certain time or other reasons, user still needs to execute "AT+CIPSHUT" command makes PDP context come back to original state.</p>   |

### 8.2.23 AT+CIPMODE Select TCPIP Application Mode

| AT+CIPMODE Select TCPIP Application Mode        |   |
|---|---|
| Test Command<br><b>AT+CIPMODE=?</b>             | Response<br><b>+CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CIPMODE?</b>              | Response<br><b>+CIPMODE: &lt;mode&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command                       |
| Write Command<br><b>AT+CIPMODE=&lt;mode&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b> 0   Normal mode<br>1   Transparent mode  |
| Parameter Saving Mode                           | NO_SAVE   |
| Max Response Time                               | -   |
| Reference                                       | Note  |

### 8.2.24 AT+CIPCCFG Configure Transparent Transfer Mode

| AT+CIPCCFG Configure Transparent Transfer Mode |  |
|--|--|
| Test Command<br><b>AT+CIPCCFG=?</b>            | Response<br><b>+CIPCCFG:</b><br><b>(NmRetry:3-8),(WaitTm:1-10),(SendSz:1-1460),(esc:0,1) ,(Rxmode:0,1),</b><br><b>(RxSize:50-1460),(Rxtimer:20-1000)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CIPCCFG?</b>             | Response<br><b>+CIPCCFG:</b><br><b>&lt;NmRetry&gt;,&lt;WaitTm&gt;,&lt;SendSz&gt;,&lt;esc&gt;,&lt;Rxmode&gt;,&lt;RxSize&gt;,&lt;Rxtime</b><br><b>r&gt;</b>  |

|   |   |
|---|---|
|   | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPCCFG=<br/>&lt;NmRetry&gt;,&lt;WaitTm&gt;,&lt;SendSz&gt;,&lt;esc&gt;[,&lt;Rxmode&gt;,&lt;RxSize&gt;,&lt;Rxtimer&gt;]</b> | Response<br><b>OK</b><br><b>ERROR</b><br><br>Parameters<br><b>&lt;NmRetry&gt;</b> Number of retries to be made for an IP packet.Default value is 5.<br><b>&lt;WaitTm&gt;</b> Number of 100ms intervals to wait for serial input before sending the packet. Default value is 2.<br><b>&lt;SendSz&gt;</b> Size in bytes of data block to be received from serial port before sending. Default value is 1024.<br><b>&lt;esc&gt;</b> Whether turn on the escape sequence, default is TRUE.<br>0      Turn off the escape sequence<br>1      Turn on the escape sequence<br><b>&lt;Rxmode&gt;</b> Whether to set time interval during output data from serial port.<br>0      output data to serial port without interval<br>1      output data to serial port within <Rxtimer> interval.<br><b>&lt;RxSize&gt;</b> Output data length for each time. Default value is 1460.<br><b>&lt;Rxtimer&gt;</b> Time interval (ms) to wait for serial port to output data again. Default value: 50ms |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note<br>This command will be effective only in single connection mode (+CIPMUX=0)   |

### 8.2.25 AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data

| <b>AT+CIPSHOWTP Display Transfer Protocol in IP Head When Received Data</b> |   |
|---|---|
| Test Command<br><b>AT+CIPSHOWTP=?</b>                                       | Response<br><b>+CIPSHOWTP: (list of supported &lt;mode&gt;s)</b><br><br><b>OK</b> |
|   | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CIPSHOWTP</b>   | Response<br><b>+CIPSHOWTP: &lt;mode&gt;</b>                                       |



|  |  |
|--|--|
| ?  | <b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPSHOWTP</b><br><b>=&lt;mode&gt;</b> | Response<br><b>OK</b><br><b>ERROR</b><br>Parameters<br><b>&lt;mode&gt;</b> A numeric parameter which indicates whether to display transfer protocol in IP header to received data or not<br><div> <u>0</u>    Not display transfer protocol<br/> 1    Display transfer protocol, the format is "+IPD, &lt;data size&gt;,&lt;TCP/UDP&gt;:&lt;data&gt;" </div> |
| Parameter    Saving<br>Mode                                  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note <ul style="list-style-type: none"> <li>● This command will be effective only in single connection mode (+CIPMUX=0).</li> <li>● Only when +CIPHEAD is set to 1, the setting of this command will work.</li> </ul>  |

### 8.2.26 AT+CIPUDPMODE    UDP Extended Mode

| <b>AT+CIPUDPMODE    UDP Extended Mode</b>         |  |
|---|--|
| Test Command<br><b>AT+CIPUDPMOD</b><br><b>E=?</b> | Response<br>1) For single IP connection (+CIPMUX=0)<br><b>+CIPUDPMODE: (0-2),(" (0-255).(0-255).(0-255).(0-255)" ),(1-65535)</b><br><br><b>OK</b><br>2) For multi IP connection (+CIPMUX=1)<br><b>+CIPUDPMODE:</b><br><b>(0-5),(0-2),(" (0-255).(0-255).(0-255).(0-255)" ),(1-65535)</b><br><br><b>OK</b><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CIPUDPMOD</b><br><b>E?</b>  | Response<br>1) For single IP connection (+CIPMUX=0)<br><b>+CIPUDPMODE: &lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b><br><br><b>OK</b><br>2) For multi IP connection (+CIPMUX=1)   |

|  |   |   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
|--|---|---|-----|---|--------|---|-----------------|--|---|-------------------|--|---|----------------------------|--------------|--|--|--------|--|-------------|
|  | <div>+CIPUDPMODE: 0,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 1,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 2,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 3,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 4,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 5,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 6,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/>+CIPUDPMODE: 7,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]<br/><br/>OK<br/><br/>Parameter<br/>See Write Command</div> |   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| Write Command<br>1) For single IP connection<br>(+CIPMUX=0)<br>AT+CIPUDPMODE=<mode>[,<IP address>,<Port>]<br>2) For multi IP connection<br>(+CIPMUX=1)<br>AT+CIPUDPMODE=<n>,<mode>[,<IP address>,<Port>] | <div>Response<br/>OK<br/>ERROR<br/><table><tr><td>&lt;n&gt;</td><td>0-7</td><td>A numeric parameter which indicates the connection number</td></tr><tr><td>&lt;mode&gt;</td><td>0</td><td>UDP Normal Mode</td></tr><tr><td></td><td>1</td><td>UDP Extended Mode</td></tr><tr><td></td><td>2</td><td>Set UDP address to be sent</td></tr><tr><td>&lt;IP address&gt;</td><td></td><td>A string parameter which indicates remote IP address</td></tr><tr><td>&lt;port&gt;</td><td></td><td>Remote port</td></tr></table></div>   | <n>   | 0-7 | A numeric parameter which indicates the connection number | <mode> | 0 | UDP Normal Mode |  | 1 | UDP Extended Mode |  | 2 | Set UDP address to be sent | <IP address> |  | A string parameter which indicates remote IP address | <port> |  | Remote port |
| <n>  | 0-7   | A numeric parameter which indicates the connection number |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| <mode>   | 0   | UDP Normal Mode   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
|  | 1   | UDP Extended Mode   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
|  | 2   | Set UDP address to be sent                                |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| <IP address>   |   | A string parameter which indicates remote IP address      |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| <port>   |   | Remote port   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| Parameter Saving Mode  | NO_SAVE   |   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| Max Response Time  | -   |   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |
| Reference  | Note  |   |     |   |        |   |                 |  |   |                   |  |   |                            |              |  |  |        |  |             |

### 8.2.27 AT+CIPRXGET Get Data from Network Manually

| AT+CIPRXGET Get Data from Network Manually |  |
|--|--|
| Test Command<br><b>AT+CIPRXGET=?</b>       | Response<br>If single IP connection (+CIPMUX=0)<br><b>+CIPRXGET: (list of supported &lt;mode&gt;s),(list of supported &lt;reqlength&gt;)</b><br><br><b>OK</b><br>If multi IP connection (+CIPMUX=1)<br><b>+CIPRXGET: (list of supported &lt;mode&gt;s), (list of supported &lt;id&gt;s), (list of supported &lt;reqlength&gt;)</b> |

|   |   |
|---|---|
|   | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CIPRXGET</b><br><b>?</b>  | Response<br><b>+CIPRXGET: &lt;mode&gt;</b>  |
|   | <b>OK</b><br>Parameters<br>See Write Command  |
| Write Command<br>1) If single IP connection<br>(+CIPMUX=0)<br><br><b>AT+CIPRXGET</b><br><b>=&lt;mode&gt;[,&lt;reqlength&gt;]</b><br><br>2) If multi IP connection<br>(+CIPMUX=1)<br><br><b>AT+CIPRXGET</b><br><b>=&lt;mode&gt;[,&lt;id&gt;,&lt;reqlength&gt;]</b> | Response<br><b>OK</b><br><b>ERROR</b><br>1)For single IP connection<br>If "AT+CIPSRIP=1" is set, IP address and port are contained.<br>if <mode>=1<br><b>+CIPRXGET: 1[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br>if <mode>=2<br><b>+CIPRXGET: 2,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br><b>1234567890...</b><br><b>OK</b><br>if <mode>=3<br><b>+CIPRXGET: 3,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br><b>5151...</b><br><b>OK</b><br>if <mode>=4<br><b>+CIPRXGET: 4,&lt;cnflength&gt;</b><br><br><b>OK</b><br>2)For multi IP connection<br>If "AT+CIPSRIP=1" is set, IP address and port is contained.<br>if <mode>=1<br><b>+CIPRXGET: 1[,&lt;id&gt;,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br>if <mode>=2<br><b>+CIPRXGET: 2,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br><b>1234567890...</b><br><b>OK</b><br>if <mode>=3<br><b>+CIPRXGET: 3,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b><br><b>5151...</b><br><b>OK</b> |

|                       |  |
|-----------------------|--|
|                       | <p>if &lt;mode&gt;=4</p> <p><b>+CIPRXGET: 4,&lt;id&gt;,&lt;cnflength&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b></p> <p><u>0</u>    Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly.</p> <p>1    Enable getting data from network manually.</p> <p>2    The module can get data, but the length of output data can not exceed 1460 bytes at a time.</p> <p>3    Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time.</p> <p>4    Query how many data are not read with a given ID.</p> <p><b>&lt;id&gt;</b>    A numeric parameter which indicates the connection number</p> <p><b>&lt;reqlength&gt;</b> Requested number of data bytes (1-1460 bytes)to be read. If &lt;mode&gt;=4,the range of &lt;reqlength&gt; is 0-2920bytes.</p> <p><b>&lt;cnflength&gt;</b> Confirmed number of data bytes to be read, which may be less than &lt;length&gt;. 0 indicates that no data can be read.</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | <p>Note</p> <p>To enable this function, parameter &lt;mode&gt; must be set to 1 before connection.</p>   |

### 8.2.28 AT+CIPRDTIMER Set Remote Delay Timer

| AT+CIPRDTIMER Set Remote Delay Timer   |  |
|--|--|
| Test Command<br><b>AT+CIPRDTIMER=?</b> | <p>Response</p> <p><b>+CIPRDTIMER: (100-4000),(100-7000)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Read Command<br><b>AT+CIPRDTIMER?</b>  | <p>Response</p> <p><b>+CIPRDTIMER: &lt;rdsigtimer&gt;,&lt;rdmuxtimer&gt;</b></p> <p><b>OK</b></p>                            |

|   |  |
|---|--|
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPRDTIMER=&lt;rdsigtimer&gt;,&lt;rdmuxtimer&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|   | Parameters<br><b>&lt;rdsigtimer&gt;</b> Remote delay timer of single connection. Default value is 2000.<br><b>&lt;rdmuxtimer&gt;</b> Remote delay timer of multi-connections. Default value is 3500. |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note<br>This command is used to shorten the disconnect time locally when the remote server has been disconnected.  |

#### 8.2.29 AT+CIPSGTXT Select GPRS PDP context

|  |   |
|--|---|
| <b>AT+CIPSGTXT</b>                               | <b>Select GPRS PDP context</b>  |
| Test Command<br><b>AT+CIPSGTXT=?</b>             | Response<br><b>+CIPSGTXT: (0,1)</b><br><b>OK</b>  |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPSGTXT=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;mode&gt;</b> <u>0</u> Select first PDP context<br>1    Select second PDP context |
| Parameter Saving Mode                            | NO_SAVE   |
| Max Response Time                                | -   |
| Reference  | Note<br>This command is used to select pdp context, only for multi IP connection (+CIPMUX=1).         |

### 8.2.30 AT+CIPSENDHEX Set CIPSEND Data Format to Hex

| AT+CIPSENDHEX Set CIPSEND Data Format to HEX       |   |
|--|---|
| Test Command<br><b>AT+CIPSENDHEX=?</b>             | Response<br><b>+ CIPSENDHEX: (0,1)</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPSENDHEX=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;mode&gt;</b> <u>0</u> The default format of output data in AT+CIPSEND.<br>1    Set the input data in HEX format when using CIPSEND command to send data. |
| Parameter Saving Mode                              | NO_SAVE   |
| Max Response Time                                  | -   |
| Reference  | Note  |

### 8.2.31 AT+CIPHEXS Set Output-data Format with suffix

| AT+CIPHEXS Set Output-data Format with suffix   |   |
|---|---|
| Test Command<br><b>AT+CIPHEXS=?</b>             | Response<br><b>+CIPHEXS: (list of supported &lt;mode&gt;s)</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPHEXS=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|   | Parameters<br><b>&lt;mode&gt;</b> <u>0</u> The default format of output data<br>1    Set the output data with suffix "0d 0a"<br>2    Set the output data in HEX format with suffix "0d 0a". |
| Parameter Saving Mode                           | NO_SAVE   |

|                   |  |
|-------------------|--|
| Max Response Time | -  |
| Reference         | Note:<br>This command is only available when "AT+CIPHEAD=1". |

### 8.2.32 AT+CIPTKA Set TCP Keepalive Parameters

| AT+CIPTKA Set TCP Keepalive Parameters  |  |
|---|--|
| Test Command<br>AT+CIPTKA=?   | <p>Response</p> <p><b>+CIPTKA:</b> (list of supported <b>&lt;mode&gt;s</b>),(list of supported <b>&lt;keepIdle&gt;s</b>),(list of supported <b>&lt;keepInterval&gt;</b>),(list of supported <b>&lt;keepCount&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br>AT+CIPTKA?  | <p>Response</p> <p><b>+CIPTKA:</b> <b>&lt;mode&gt;</b>,<b>&lt;keepIdle&gt;</b>,<b>&lt;keepInterval&gt;</b>,<b>&lt;keepCount&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT+CIPTKA=<<br><b>mode&gt;</b> ],[ <b>&lt;keepI<br/>dle&gt;</b> ],[ <b>&lt;keepInte<br/>rval&gt;</b> ],[ <b>&lt;keepCo<br/>unt&gt;</b> ]]] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b> Set TCP keepalive option.<br/>0 Disable TCP keep alive mechanism<br/>1 Enable TCP keep alive mechanism</p> <p><b>&lt;keepIdle&gt;</b> Integer type; Idle time (in second) before TCP send the initial keepalive probe.<br/>30-7200 Default: 7200</p> <p><b>&lt;keepInterval&gt;</b> Interval time (in second) between keepalive probes retransmission.<br/>30-600 Default: 75</p> <p><b>&lt;keepCount&gt;</b> Integer type; Maximum number of keepalive probes to be sent.<br/>1-9 Default: 9</p> |
| Parameter Saving Mode   | NO_SAVE  |

|                   |      |
|-------------------|------|
| Max Response Time | -    |
| Reference         | Note |

### 8.2.33 AT+CIPOPTION Enable or Disable TCP nagle algorithm

| AT+CIPOPTION Enable or Disable TCP nagle algorithm      |  |
|---|--|
| Test Command<br><b>AT+CIPOPTION<br/>N=?</b>             | <p>Response</p> <p><b>+CIPOPTION:</b> (list of supported &lt;mode&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CIPOPTION<br/>N?</b>              | <p>Response</p> <p><b>+CIPOPTION:</b> &lt;mode&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CIPOPTION<br/>N=&lt;mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;mode&gt;            Config to enable or disable TCP nagle algorithm</p> <p>0    Enable TCP nagle algorithm</p> <p>1    Disable TCP nagle algorithm</p> |
| Parameter Saving Mode                                   | NO_SAVE  |
| Max Response Time                                       | -  |
| Reference   | Note   |



## 9 AT Commands for HTTP Application

SIM7000 series has an embedded TCP/IP stack that is driven by AT commands and enables the host application to easily access the Internet HTTP service. This chapter is a reference guide to all the AT commands and responses defined to use with the TCP/IP stack in HTTP Service.

### 9.1 Overview

| Command       | Description   |
|---------------|---|
| AT+HTTPINIT   | Initialize HTTP service                             |
| AT+HTTPTERM   | Terminate HTTP service                              |
| AT+HTTPPARA   | Set HTTP parameters value                           |
| AT+HTTPDATA   | Input HTTP data                                     |
| AT+HTTPACTION | HTTP method action                                  |
| AT+HTTPREAD   | Read the HTTP server response                       |
| AT+HTTPSTATUS | Read HTTP status                                    |
| AT+HTTPHEAD   | Read the HTTP header information of server response |
| AT+HTTPTOFS   | Download file to ap file system                     |
| AT+HTTPTOFSRL | State of download file to ap file system            |

### 9.2 Detailed Descriptions of Commands

#### 9.2.1 AT+HTTPINIT Initialize HTTP Service

| AT+HTTPINIT Initialize HTTP Service |   |
|-------------------------------------|---|
| Test Command<br>AT+HTTPINIT=?       | Response<br><b>OK</b>   |
| Execution Command<br>AT+HTTPINIT    | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
| Parameter Saving Mode               | NO_SAVE   |
| Max Response Time                   | -   |
| Reference                           | Note<br>HTTPINIT should first be executed to initialize the HTTP service.                           |

## 9.2.2 AT+HTTPTERM Terminate HTTP Service

| AT+HTTPTERM Terminate HTTP Service      |   |
|---|---|
| Test Command<br><b>AT+HTTPTERM=?</b>    | Response<br><b>OK</b>   |
| Execution command<br><b>AT+HTTPTERM</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
| Parameter Saving Mode                   | NO_SAVE   |
| Max Response Time                       | -   |
| Reference                               | Note  |

## 9.2.3 AT+HTTPPARA Set HTTP Parameters Value

| AT+HTTPPARA Set HTTP Parameters Value   |   |
|---|---|
| Test Command<br><b>AT+HTTPPARA=?</b>  | Response<br><b>+HTTPPARA: "HTTPParamTag","HTTPParamValue"</b>                                       |
|   | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Read Command<br><b>AT+HTTPPARA?</b>   | Response<br><b>+HTTPPARA:</b><br><b>&lt;HTTPParamTag&gt;,&lt;HTTPParamValue&gt;</b>                 |
|   | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+HTTPPARA=&lt;HTTPParamTag&gt;,&lt;HTTPParamValue&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters<br><b>&lt;HTTPParamTag&gt;</b><br>"CID" HTTP Parameter<br>"URL"                          |

|                  |  |
|------------------|--|
|                  | <p>(Mandatory Parameter) Bearer profile identifier</p> <p>(Mandatory Parameter) HTTP client URL</p> <p><u>"http://server'/path':tcpPort' "</u></p> <p>"server": FQDN or IP-address</p> <p>"path": path of file or directory</p> <p>"UA" "tcpPort": default value is 80.</p> <p>Refer to "IETF-RFC 2616".</p> <p>The user agent string which is set by the application to identify the mobile. Usually this parameter is set as operation system and software</p> |
| "PROIP"          | version information.   |
| "PROPORT"        | Default value is "SIMCom_MODULE".  |
| "REDIR"          | <p>The IP address of HTTP proxy server</p> <p>The port of HTTP proxy server</p> <p>This flag controls the redirection mechanism of the SIM800 when it is acting as HTTP client (numeric). If the server sends a redirect code (range 30x), the client will automatically send a</p>  |
| "BREAK"          | <p>new HTTP request when the flag is set to (1).</p> <p>Default value is 0 (no redirection).</p>   |
| "BREAKEND"       | <p>Parameter for HTTP method "GET", used for resuming broken transfer.</p> <p>Parameter for HTTP method "GET", used for resuming broken transfer. which is used together with "BREAK",</p> <p>If the value of "BREAKEND" is bigger than "BREAK", the transfer scope is from "BREAK" to "BREAKEND".</p> <p>If the value of "BREAKEND" is smaller than</p>   |
| "TIMEOUT"        | <p>"BREAK", the transfer scope is from "BREAK" to the end of the file.</p> <p>If both "BREAKEND" and "BREAK" are 0, the resume broken transfer function is disabled.</p> <p>HTTP session timeout value, scope: 30-1000 second.</p> <p>Default value is 120 seconds.</p>  |
| "CONTENT"        | <p>HTTP Parameter value. Type and supported content depend on related &lt;HTTPParamTag&gt;.</p>  |
| "USERDATA"       | Used to set the "Content-Type" field in HTTP   |
| <HTTPParamValue> | <p>header.</p> <p>User data</p> <p>HTTP Parameter value. Type and supported content depend on related &lt;HTTPParamTag&gt;.</p>  |

|                       |  |
|-----------------------|--|
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note<br>Not all the HTTP Server supports "BREAK" and "BREAKEND" parameters |

## 9.2.4 AT+HTTPDATA Input HTTP Data

| AT+HTTPDATA Input HTTP Data                                   |   |
|---|---|
| Test Command<br><b>AT+HTTPDATA=?</b>                          | <p>Response<br/><b>+HTTPDATA: (list of supported &lt;size&gt;s),(list of supported &lt;time&gt;s)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+HTTPDATA=&lt;size&gt;,&lt;time&gt;</b> | <p>Response<br/><b>DOWNLOAD</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;size&gt;</b>      Size in bytes of the data to POST.<br/>1-319488 (bytes)<br/>0 means delete all the content.</p> <p><b>&lt;time&gt;</b>      1000-120000 (millisecond) Maximum time in milliseconds to input data.</p> |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note<br>It is strongly recommended to set enough time to input all data with the length of <size>.  |

## 9.2.5 AT+HTTPACTION HTTP Method Action

| AT+HTTPACTION HTTP Method Action |
|----------------------------------|
|----------------------------------|

|  |  |
|--|--|
| <p>Test Command<br/><b>AT+HTTPACTION=?</b></p>               | <p>Response<br/><b>+HTTPACTION: (0-3)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| <p>Write Command<br/><b>AT+HTTPACTION=&lt;Method&gt;</b></p> | <p>Response<br/><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Unsolicited Result Code<br/><b>+HTTPACTION: &lt;Method&gt;,&lt;StatusCode&gt;,&lt;DataLen&gt;</b></p> <p>Parameters</p> <p><b>&lt;Method&gt;</b> HTTP method specification:</p> <ul style="list-style-type: none"> <li>0 GET</li> <li>1 POST</li> <li>2 HEAD</li> <li>3 DELETE</li> </ul> <p><b>&lt;StatusCode&gt;</b> HTTP Status Code responded by remote server, it identifier refer to HTTP1.1(RFC2616)</p> <ul style="list-style-type: none"> <li>100 Continue</li> <li>101 Switching Protocols</li> <li>200 OK</li> <li>201 Created</li> <li>202 Accepted</li> <li>203 Non-Authoritative Information</li> <li>204 No Content</li> <li>205 Reset Content</li> <li>206 Partial Content</li> <li>300 Multiple Choices</li> <li>301 Moved Permanently</li> <li>302 Found</li> <li>303 See Other</li> <li>304 Not Modified</li> <li>305 Use Proxy</li> <li>307 Temporary Redirect</li> <li>400 Bad Request</li> <li>401 Unauthorized</li> <li>402 Payment Required</li> <li>403 Forbidden</li> <li>404 Not Found</li> <li>405 Method Not Allowed</li> </ul> |

|                       |   |
|-----------------------|---|
|                       | 406 Not Acceptable<br>407 Proxy Authentication Required<br>408 Request Time-out<br>409 Conflict<br>410 Gone<br>411 Length Required<br>412 Precondition Failed<br>413 Request Entity Too Large<br>414 Request-URI Too Large<br>415 Unsupported Media Type<br>416 Requested range not satisfiable<br>417 Expectation Failed<br>500 Internal Server Error<br>501 Not Implemented<br>502 Bad Gateway<br>503 Service Unavailable<br>504 Gateway Time-out<br>505 HTTP Version not supported<br>600 Not HTTP PDU<br>601 Network Error<br>602 No memory<br>603 DNS Error<br>604 Stack Busy<br><br><b>&lt;DataLen&gt;</b> The length of data got |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | About 5 seconds in test, dependence on network status and the size of request website   |
| Reference             | Note  |

### 9.2.6 AT+HTTPREAD Read the HTTP Server Response

| AT+HTTPREAD Read the HTTP Server Response |  |
|---|--|
| Test Command<br><b>AT+HTTPREAD=?</b>      | Response<br><b>+HTTPREAD:</b> (list of supported <b>&lt;start_address&gt;</b> s),(list of supported <b>&lt;byte_size&gt;</b> s)<br><br><b>OK</b> |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+HTTPREAD</b>       | Response<br><b>+HTTPREAD: &lt;date_len&gt;</b>   |

|                                  |   |
|----------------------------------|---|
| D=<start_addresses>,<byte_size>  | <p>&lt;data&gt;<br/>OK</p> <p>Read data when AT+HTTPACTION=0 or AT+HTTPDATA is executed.</p> <p>If&lt;byte_size&gt; is bigger than the data size received, module will only return actual data size.</p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;data&gt; Data from HTTP server or user input.</p> <p>&lt;start_address&gt; The starting point for data output.<br/>0-319488 (bytes)</p> <p>&lt;byte_size&gt; The length for data output.<br/>1-319488 (bytes)</p> <p>&lt;data_len&gt; The actual length for data output.</p> |
| Execution Command<br>AT+HTTPREAD | <p>Response<br/><b>+HTTPREAD: &lt;data_len&gt;</b><br/>&lt;data&gt;<br/>OK</p> <p>Read all data when AT+HTTPACTION=0 or AT+HTTPDATA is executed.</p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p>   |
| Parameter Saving Mode            | NO_SAVE   |
| Max Response Time                | -   |
| Reference                        | Note  |

## 9.2.7 AT+HTTPSTATUS Read HTTP Status

| AT+HTTPSTATUS Read HTTP Status  |                |
|---------------------------------|----------------|
| Test Command<br>AT+HTTPSTATUS=? | Response<br>OK |

|                                       |   |
|---------------------------------------|---|
| Read Command<br><b>AT+HTTPSTATUS?</b> | <p>Response</p> <p><b>+HTTPSTATUS: &lt;mode&gt;,&lt;status&gt;,&lt;finish&gt;,&lt;remain&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p><b>Parameters:</b></p> <p><b>&lt;mode&gt;</b></p> <p>GET</p> <p>POST</p> <p>HEAD</p> <p><b>&lt;status&gt;</b></p> <p>0 idle</p> <p>1 receiving</p> <p>2 sending</p> <p><b>&lt;finish&gt;</b></p> <p>The amount of data which have been transmitted</p> <p><b>&lt;remain&gt;</b></p> <p>The amount of data remaining to be sent or received</p> |
| Parameter Saving Mode                 | NO_SAVE   |
| Max Response Time                     | -   |

### 9.2.8 AT+HTTPHEAD Read the HTTP Header Information of Server Response

| <b>AT+HTTPHEAD</b>                      | <b>Read the HTTP Header Information of Server Response</b>   |
|---|--|
| Test Command<br><b>AT+HTTPHEAD=?</b>    | <p>Response</p> <p><b>OK</b></p>   |
| Execution Command<br><b>AT+HTTPHEAD</b> | <p>Response</p> <p><b>+HTTPHEAD: &lt;date_len&gt;</b></p> <p><b>&lt;data&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p><b>Parameters</b></p> <p><b>&lt;date_len&gt;</b> The actual length for http header data output</p> <p><b>&lt;data&gt;</b> Data from HTTP server</p> |
| Parameter Saving Mode                   | NO_SAVE  |
| Max Response Time                       | -  |



|           |   |
|-----------|---|
| Time      |   |
| Reference | Note<br>Read header data when AT+HTTPACTION=0 executed. |

### 9.2.9 AT+HTTPTOFS Download File to AP File System

| AT+HTTPTOFS Download File to AP File System   |  |
|---|--|
| Test Command<br><b>AT+HTTPTOFS=?</b>  | Response<br><b>+HTTPTOFS: (1-255),(1-127)</b><br><br><b>OK</b>   |
| Read Command<br><b>AT+HTTPTOFS?</b>   | Response<br><b>+HTTPTOFS: &lt;status&gt;,&lt;url&gt;,&lt;file_path&gt;</b><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
| Write Command<br><b>AT+HTTPTOFS=&lt;url&gt;,&lt;file_path&gt;[&lt;timeout&gt;[,&lt;retrycnt&gt;]]</b> | Response<br><b>OK</b><br><br><b>+HTTPTOFS: &lt;StatusCode&gt;,&lt;DataLen&gt;</b><br><br>Parameters<br><b>&lt;status&gt;</b><br>0 Idle<br>1 Busy<br><b>&lt;url&gt;</b> The url<br><b>&lt;file_path&gt;</b><br>File path and name on ap side,<br>For example: "/customer/test.bin","custapp/ test.bin",<br>"/fota/test.bin"<br><b>&lt;timeout&gt;</b> Timeout of HTTP request. Unit is second.<br>Range is 10-1000, default value is 50.<br><b>&lt;retrycnt&gt;</b> Retry times of HTTP request.<br>Range is 5-100, default value is 5.<br><b>&lt;StatusCode&gt;</b> HTTP Status Code responded by remote server, it identifier refer to HTTP1.1(RFC2616)<br>100 Continue<br>200 OK<br>206 Partial Content<br>400 Bad Request |

|                       |  |
|-----------------------|--|
|                       | <p>404 Not Found</p> <p>408 Request Time-out</p> <p>500 Internal Server Error</p> <p>600 Not HTTP PDU</p> <p>601 Network Error</p> <p>602 No memory</p> <p>603 DNS Error</p> <p>604 Stack Busy</p> <p>620 SSL continue</p> <p>65535 Other Errors</p> <p><b>&lt;DataLen&gt;</b><br/>The length of data download</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

#### 9.2.10 AT+HTTPTOFSRL State of Download File to AP File System

| AT+HTTPTOFSRL State of Download File to AP File System |  |
|--|--|
| Test Command<br><b>AT+HTTPTOFSRL=?</b>                 | Response<br><b>OK</b>  |
| Read Command<br><b>AT+HTTPTOFSRL?</b>                  | <p>Response<br/><b>+HTTPTOFSRL: &lt;status&gt;,&lt;curlen&gt;,&lt;totalen&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/> <b>&lt;status&gt;</b> Downloading state<br/>             0 Idle<br/>             1 During downloading<br/> <b>&lt;curlen&gt;</b> The length of data have been download successfully<br/> <b>&lt;totalen&gt;</b> The length of data download. If total length does not been got, <b>&lt;totalen&gt;</b> will be 0.</p> |
| Parameter Saving Mode                                  | NO_SAVE  |
| Max Response Time                                      | -  |
| Reference  | Note   |

SIMCOM CONFIDENTIAL FILE

## 10 AT Commands for PING Application

SIM7000 series modules provide PING AT command is as follows:

### 10.1 Overview

| Command    | Description                              |
|------------|--|
| AT+CIPPING | PING Request                             |
| AT+CIPCTL  | Set the Mode When Receiving an IP Packet |
| AT+CIPFLT  | Set the Rules of IP Filter               |

### 10.2 Detailed Descriptions of Commands

#### 10.2.1 AT+CIPPING PING Request

| AT+CIPPING PING Request  |  |
|--|--|
| Test Command<br>AT+CIPPING=?   | <p>Response</p> <p>+CIPPING: (list of supported &lt;retryNum&gt;s),(list of supported &lt;dataLen&gt;s),(list of supported &lt;timeout&gt;s),(list of supported &lt;ttl&gt;s)</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+CIPPING?  | <p>Response</p> <p>+CIPPING: &lt;retryNum&gt;,&lt;dataLen&gt;,&lt;timeout&gt;,&lt;ttl&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CIPPING=<IPAddr>,<retryNum>,<dataLen>,<timeout>,<ttl>] | <p>Response</p> <p>+CIPPING: &lt;replyId&gt;,&lt;Ip Address&gt;,&lt;replyTime&gt;,&lt;ttl&gt;[&lt;CR&gt;&lt;LF&gt;+CIPPING: &lt;replyId&gt;,&lt;Ip Address&gt;,&lt;replyTime&gt;,&lt;ttl&gt;[...]]</p> <p>OK</p> <p>or</p> <p>ERROR</p> <p>or</p> <p>+CME ERROR: &lt;err&gt;</p> |

|                       |  |   |
|-----------------------|--|---|
|                       |  | Parameters<br><b>&lt;IPAddr&gt;</b> Address of the remote host, string type. This parameter can be either:<br>- IP address in the format: "xxx.xxx.xxx.xxx"<br>- Host name solved by a DNS query<br><b>&lt;retryNum&gt;</b> The number of Ping Echo Request to send<br>1-100 Default: 4<br><b>&lt;dataLen&gt;</b> The length of Ping Echo Request data<br>0-1024 Default: 8<br><b>&lt;timeout&gt;</b> The timeout, in units of 100 ms, waiting for a single Echo Reply<br>1-600 Default: 100(10 seconds)<br><b>&lt;tll&gt;</b> Time to live<br>1-255 Default: 64<br><b>&lt;replyId&gt;</b> Echo Reply number<br><b>&lt;IP Address&gt;</b> IP Address of the remote host<br><b>&lt;replyTime&gt;</b> Time, in ms, required to receive the response |
| Parameter Saving Mode |  | NO_SAVE   |
| Max Response Time     |  | -   |
| Reference             |  | Note <ul style="list-style-type: none"> <li>Before sending PING Request the GPRS context must be activated.</li> <li>When the Echo Request timeout expires (no reply received on time), the response will contains <b>&lt;replyTime&gt;</b> setting to 600 and <b>&lt;tll&gt;</b> setting to 255.</li> <li>When executing this command, if PDP context is deactivated for some reasons, such as out of service, etc.the "+PDP: DEACT" URC is reported and the command will end immediately.</li> <li>If executing the command in NB-IOT network,please config <b>&lt;timeout&gt;</b> to 300(30 second).For example:<br/> AT+CIPPING="www.google.cn",4,8,300,64 </li> </ul>  |

## 10.2.2 AT+CIPCTL Set the Mode When Receiving an IP Packet

| AT+CIPCTL Set the Mode When Receiving an IP Packet |  |
|--|--|
| Test Command<br>AT+CIPCTL=?                        | Response<br>+CIPCTL: (list of supported <mode>s)<br><br>OK |
|  | Parameters<br>See Write Command                            |

|  |   |
|--|---|
| Read Command<br><b>AT+CIPCTL?</b>              | Response<br><b>+CIPCTL: &lt;mode&gt;</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CIPCTL=&lt;mode&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;mode&gt;</b> 0    Disable to send Echo Reply<br>1    Enable to send Echo Reply to every IP address<br>pinging it<br>2    Enable to send Echo Reply only to a subset of IP<br>Addresses pinging it. This subset of IP Addresses<br>can be set by "AT+CIPFLT" command. |
| Parameter    Saving<br>Mode                    | NO_SAVE   |
| Max Response Time                              | -   |
| Reference                                      | Note<br>The value of <b>&lt;mode&gt;</b> is stored in non volatile memory.  |

### 10.2.3 AT+CIPFLT Set the Rules of IP Filter

| <b>AT+CIPFLT Set the Rules of IP Filter</b> |  |
|---|--|
| Test Command<br><b>AT+CIPFLT=?</b>          | Response<br><b>+CIPFLT: (list of supported &lt;action&gt;s),(list of supported &lt;item&gt;s)</b>  |
|   | <b>OK</b>  |
|   | Parameter<br>See Write Command   |
| Read Command<br><b>AT+CIPFLT?</b>           | Response<br><b>+CIPFLT: &lt;item&gt;,&lt;ipAddr&gt;,&lt;mask&gt;</b><br><b>[&lt;CR&gt;&lt;LF&gt;+CIPFLT: &lt;item&gt;,&lt;ipAddr&gt;,&lt;mask&gt;</b><br><b>[...]]</b> |
|   | <b>OK</b>  |
|   | Parameter<br>See Write Command   |

|   |  |
|---|--|
| <p>Write Command<br/><b>AT+CIPFLT=&lt;action&gt;[,&lt;item&gt;][,&lt;ipAddr&gt;,&lt;mask&gt;]</b></p> | <p>Response<br/><b>OK</b><br/>or<br/><b>ERROR</b><br/>or<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameter</p> <p><b>&lt;action&gt;</b>    0    Remove the rule specified by &lt;item&gt;. &lt;item&gt; must be given.<br/>                  1    Add the rule specified by &lt;item&gt;. If &lt;item&gt; is not given, it can find an empty item automatically. &lt;ipAddr&gt; and &lt;mask&gt; must be given.<br/>                  2    Delete all of rules</p> <p><b>&lt;item&gt;</b>                    The item of IP filter rule<br/>                  1-20</p> <p><b>&lt;ipAddr&gt;</b>                Remote IP address,string type. It can be any valid IP address in the format of "xxx.xxx.xxx.xxx"</p> <p><b>&lt;mask&gt;</b>                    Mask to be applied to the &lt;ipAddr&gt;,string type. It can be any valid IP address mask in the format of "xxx.xxx.xxx.xxx"</p> |
| <p>Parameter    Saving Mode</p>   | <p>NO_SAVE</p>   |
| <p>Max Response Time</p>  | <p>-</p>   |
| <p>Reference</p>  | <p>Note</p> <ul style="list-style-type: none"> <li>● When a packet comes from the IP address <b>coming_IP</b>, All rules will be scanned to match the following criteria:<br/>                  <b>&lt;coming_IP&gt; &amp; &lt;mask&gt; = &lt;ipAddr&gt; &amp; &lt;mask&gt;</b><br/>If the criterion is matched, the IP packet will be accepted and the rule scan is finished. If the criterion is not matched, the IP packet will be ignored.</li> <li>● The rule is stored in non volatile memory.</li> </ul>  |

## 11 AT Commands for FTP Application

SIM7000 series has an embedded TCP/IP stack that is driven by AT commands and enables the host application to easily access the Internet FTP service. This chapter is a reference guide to all the AT commands and responses defined for using with the TCP/IP stack in FTP Service.

### 11.1 Overview

| Command       | Description   |
|---------------|---|
| AT+FTPPORT    | Set FTP control port  |
| AT+FTPMODE    | Set active or passive FTP mode  |
| AT+FTPTYPE    | Set the type of data to be transferred                                      |
| AT+FTPPUTOPT  | Set FTP put type  |
| AT+FTPCID     | Set FTP bearer profile identifier   |
| AT+FTPREST    | Set resume broken download  |
| AT+FTPSERV    | Set FTP server address  |
| AT+FTPUN      | Set FTP user name   |
| AT+FTPPW      | Set FTP password  |
| AT+FTPGETNAME | Set download file name  |
| AT+FTPGETPATH | Set download file path  |
| AT+FTPPUTNAME | Set upload file name  |
| AT+FTPPUTPATH | Set upload file path  |
| AT+FTPGET     | Download file   |
| AT+FTPPUT     | Set upload file   |
| AT+FTPDELE    | Delete specified file in FTP server   |
| AT+FTPSIZE    | Get the size of specified file in FTP server                                |
| AT+FTPSTATE   | Get the FTP state   |
| AT+FTPEXTPUT  | Extend upload file  |
| AT+FTPMKD     | Make directory on the remote machine  |
| AT+FTPRMD     | Remove directory on the remote machine                                      |
| AT+FTPLIST    | List contents of directory on the remote machine                            |
| AT+FTPEXTGET  | Extend download file  |
| AT+FTPETPUT   | Upload File   |
| AT+FTPETGET   | Download File   |
| AT+FTPQUIT    | Quit current FTP session  |
| AT+FTPRENAME  | Rename the Specified File on the Remote Machine                             |
| AT+FTPMDTM    | Get the Last Modification Timestamp of Specified File on the Remote Machine |



## 11.2 Detailed Descriptions of Commands

### 11.2.1 AT+FTPPORT Set FTP Control Port

| AT+FTPPORT Set FTP Control Port                  |  |
|--|--|
| Test Command<br><b>AT+FTPPORT=?</b>              | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPPORT?</b>               | Response<br><b>+FTPPORT: &lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+FTPPORT=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;value&gt;</b> The value of FTP Control port, from 1 to 65535.<br>Default value is 21 |
| Parameter Saving Mode                            | NO_SAVE  |
| Max Response Time                                | -  |
| Reference  | Note<br>Numbers above 65535 are illegal as the port identification fields are 16 bits long in the TCP header.  |

### 11.2.2 AT+FTPMODE Set Active or Passive FTP Mode

| AT+FTPMODE Set Active or Passive FTP Mode |  |
|---|--|
| Test Command<br><b>AT+FTPMODE=?</b>       | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPMODE?</b>        | Response<br><b>+FTPMODE: &lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |

|   |   |
|---|---|
| Write Command<br><b>AT+FTPMODE</b><br><b>=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters<br><b>&lt;value&gt;</b> 0    Active FTP mode<br><u>1</u> Passive FTP mode                |
| Parameter Saving Mode                                       | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

### 11.2.3 AT+FTPTYPE Set the Type of Data to Be Transferred

| <b>AT+FTPTYPE Set the Type of Data to Be Transferred</b> |  |
|--|--|
| Test Command<br><b>AT+FTPTYPE=?</b>                      | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPTYPE?</b>                       | Response<br><b>+FTPTYPE: &lt;value&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+FTPTYPE=&lt;value&gt;</b>         | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameters<br><b>&lt;value&gt;</b> "A"    For FTP ASCII sessions<br>" <u>I</u> "    For FTP Binary sessions  |
| Parameter Saving Mode                                    | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note<br><br>When this value is set to A, all the data sent by the stack to the FTP server is made of 7 bits characters (NVT-ASCII: the MSB is set to 0). As a consequence binary data containing 8 bits characters will be corrupted |

during the transfer if the FTPTYPE is set to A.

## 11.2.4 AT+FTPPUTOPT Set FTP Put Type

| AT+FTPPUTOPT Set FTP Put Type                            |  |
|--|--|
| Test Command<br><b>AT+FTPPUTOPT<br/>T=?</b>              | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPPUTOPT<br/>T?</b>               | Response<br><b>+FTPPUTOPT: &lt;value&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+FTPPUTOPT<br/>T=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>                                |
|  | Parameters<br><b>&lt;value&gt;</b> "APPE" For appending file<br>"STOU" For storing unique file<br>" <u>STOR</u> " For storing file |
| Parameter Saving Mode                                    | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

## 11.2.5 AT+FTPCID Set FTP Bearer Profile Identifier

| AT+FTPCID Set FTP Bearer Profile Identifier |  |
|---|--|
| Test Command<br><b>AT+FTPCID=?</b>          | Response<br><b>OK</b>                                      |
|   | Parameters<br>See Write Command                            |
| Read Command<br><b>AT+FTPCID?</b>           | Response<br><b>+FTPCID: &lt;value&gt;</b><br><br><b>OK</b> |

|   |   |
|---|---|
|   | Parameter<br>See Write Command  |
| Write Command<br><b>AT+FTPCID=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters<br><b>&lt;value&gt;</b> Bearer profile identifier refer to AT+SAPBR                      |
| Parameter Saving Mode                           | NO_SAVE   |
| Max Response Time                               | -   |
| Reference                                       | Note  |

### 11.2.6 AT+FTPREST Set Resume Broken Download

| <b>AT+FTPREST Set Resume Broken Download</b>     |   |
|--|---|
| Test Command<br><b>AT+FTPREST=?</b>              | Response<br><b>OK</b>   |
| Read Command<br><b>AT+FTPREST?</b>               | Response<br><b>+FTPREST: &lt;value&gt;</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+FTPREST=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;value&gt;</b> Broken point to be resumed                                       |
| Parameter Saving Mode                            | NO_SAVE   |
| Max Response Time                                | -   |
| Reference  | Note  |

## 11.2.7 AT+FTPSERV Set FTP Server Address

| AT+FTPSERV Set FTP Server Address                |  |
|--|--|
| Test Command<br><b>AT+FTPSERV=?</b>              | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPSERV?</b>               | Response<br><b>+FTPSERV: &lt;value&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+FTPSERV=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|  | Parameters<br><b>&lt;value&gt;</b> 32-bit number in dotted-decimal notation (i.e. xxx.xxx.xxx.xxx) or alphanumeric ASCII text string up to 49 characters if DNS is available |
| Parameter Saving Mode                            | NO_SAVE  |
| Max Response Time                                | -  |
| Reference  | Note   |

## 11.2.8 AT+FTPUN Set FTP User Name

| AT+FTPUN Set FTP User Name        |   |
|-----------------------------------|---|
| Test Command<br><b>AT+FTPUN=?</b> | Response<br><b>OK</b>                                     |
|                                   | Parameters<br>See Write Command                           |
| Read Command<br><b>AT+FTPUN?</b>  | Response<br><b>+FTPUN: &lt;value&gt;</b><br><br><b>OK</b> |
|                                   | Parameters<br>See Write Command                           |

|  |   |
|--|---|
| Write Command<br><b>AT+FTPUN=&lt;value&gt;</b> | Response<br><b>OK</b><br><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 49 characters.                  |
| Parameter Saving Mode                          | NO_SAVE   |
| Max Response Time                              | -   |
| Reference                                      | Note  |

### 11.2.9 AT+FTPPW Set FTP Password

| <b>AT+FTPPW Set FTP Password</b>               |   |
|--|---|
| Test Command<br><b>AT+FTPPW=?</b>              | Response<br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+FTPPW?</b>               | Response<br><b>+FTPPW: &lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command        |
| Write Command<br><b>AT+FTPPW=&lt;value&gt;</b> | Response<br><b>OK</b><br><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 49 characters.                  |
| Parameter Saving Mode                          | NO_SAVE   |
| Max Response Time                              | -   |
| Reference                                      | Note  |

## 11.2.10 AT+FTPGETNAME Set Download File Name

| AT+FTPGETNAME Set Download File Name                |   |
|---|---|
| Test Command<br><b>AT+FTPGETNAME=?</b>              | Response<br><b>OK</b>   |
| Read Command<br><b>AT+FTPGETNAME?</b>               | Response<br><b>+FTPGETNAME: &lt;value&gt;</b><br><br><b>OK</b>                                      |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+FTPGETNAME=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 99 characters               |
| Parameter Saving Mode                               | NO_SAVE   |
| Max Response Time                                   | -   |
| Reference   | Note  |

## 11.2.11 AT+FTPGETPATH Set Download File Path

| AT+FTPGETPATH Set Download File Path                |   |
|---|---|
| Test Command<br><b>AT+FTPGETPATH=?</b>              | Response<br><b>OK</b>   |
| Read Command<br><b>AT+FTPGETPATH?</b>               | Response<br><b>+FTPGETPATH: &lt;value&gt;</b><br><br><b>OK</b>    |
|   | Parameters<br>See Write Command                                   |
| Write Command<br><b>AT+FTPGETPATH=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality: |

|                       |  |
|-----------------------|--|
|                       | <b>+CME ERROR: &lt;err&gt;</b>   |
|                       | Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 255 characters |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

### 11.2.12 AT+FTPPUTNAME Set Upload File Name

| AT+FTPPUTNAME Set Upload File Name                  |  |
|---|--|
| Test Command<br><b>AT+FTPPUTNAME=?</b>              | Response<br><b>OK</b>  |
| Read Command<br><b>AT+FTPPUTNAME?</b>               | Response<br><b>+FTPPUTNAME: &lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+FTPPUTNAME=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 99 characters |
| Parameter Saving Mode                               | NO_SAVE  |
| Max Response Time                                   | -  |
| Reference   | Note   |



### 11.2.13 AT+FTPPUTPATH Set Upload File Path

| AT+FTPPUTPATH Set Upload File Path                  |   |
|---|---|
| Test Command<br><b>AT+FTPPUTPATH=?</b>              | Response<br><b>OK</b>   |
| Read Command<br><b>AT+FTPPUTPATH?</b>               | Response<br><b>+FTPPUTPATH: &lt;value&gt;</b><br><b>OK</b>  |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+FTPPUTPATH=&lt;value&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters<br><b>&lt;value&gt;</b> Alphanumeric ASCII text string up to 255 characters              |
| Parameter Saving Mode                               | NO_SAVE   |
| Max Response Time                                   | -   |
| Reference   | Note  |

### 11.2.14 AT+FTPGET Download File

| AT+FTPGET Download File  |  |
|--|--|
| Test Command<br><b>AT+FTPGET=?</b>                                 | Response<br><b>OK</b>  |
| Write Command<br><b>AT+FTPGET=&lt;mode&gt;[,&lt;reqlength&gt;]</b> | Response   |
|  | If mode is 1 and it is a successful FTP get session:<br><b>OK</b><br><b>+FTPGET: 1,1</b> |
|  | If data transfer finished:<br><b>+FTPGET: 1,0</b>  |
|  | If mode is 1 and it is a failed FTP get session:   |

|                       |   |
|-----------------------|---|
|                       | <p><b>OK</b></p> <p><b>+FTPGET: 1,&lt;error&gt;</b></p> <p>If mode is 2:</p> <p><b>+FTPGET: 2,&lt;cnflength&gt;</b></p> <p><b>012345678...</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>    1    For opening FTP get session<br/>                     2    For reading FTP download data.</p> <p><b>&lt;reqlength&gt;</b> Requested number of data bytes (1-1460) to be read</p> <p><b>&lt;cnflength&gt;</b> Confirmed number of data bytes to be read, which may be less than <b>&lt;length&gt;</b>. 0 indicates that no data can be read.</p> <p><b>&lt;error&gt;</b>    61    Net error<br/>                     62    DNS error<br/>                     63    Connect error<br/>                     64    Timeout<br/>                     65    Server error<br/>                     66    Operation not allow<br/>                     70    Replay error<br/>                     71    User error<br/>                     72    Password error<br/>                     73    Type error<br/>                     74    Rest error<br/>                     75    Passive error<br/>                     76    Active error<br/>                     77    Operate error<br/>                     78    Upload error<br/>                     79    Download error<br/>                     80    Manual quit</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | 75 seconds(In case no response is received from server)   |
| Reference             | <p>Note</p> <p>When "+FTPGET: 1,1" is shown, then use "AT+FTPGET=2,&lt;reqlength&gt;" to read data. If the module still has unread data, "+FTPGET: 1,1" will be shown again in a certain time.</p>  |

## 11.2.15 AT+FTPPUT Set Upload File

| AT+FTPPUT Set Upload File  |  |
|--|--|
| Test Command<br><b>AT+FTPPUT=?</b>                                   | Response<br><b>OK</b>  |
| Write Command<br><b>AT+FTPPUT=&lt;mode&gt;[,&lt;reqlength&gt;th]</b> | <p>Response</p> <p>If mode is 1 and it is a successful FTP get session:<br/><b>OK</b></p> <p><b>+FTPPUT: 1,1,&lt;maxlength&gt;</b></p> <p>If mode is 1 and it is a failed FTP get session:<br/><b>OK</b></p> <p><b>+FTPPUT: 1,&lt;error&gt;</b></p> <p>If mode is 2 and &lt;reqlength&gt; is not 0<br/><b>+FTPPUT: 2,&lt;cnflength&gt;</b><br/>..... //Input data<br/><b>OK</b><br/><b>+FTPPUT: 1,1,1360</b></p> <p>If mode is 2 and &lt;reqlength&gt; is 0, it will respond OK, and FTP session will be closed<br/><b>OK</b></p> <p>If data transfer finished.<br/><b>+FTPPUT: 1,0</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>      1    For opening FTP put session<br/>                 2    For writing FTP upload data.</p> <p><b>&lt;reqlength&gt;</b>   Requested number of data bytes(0-&lt;maxlength&gt;) to be transmitted</p> <p><b>&lt;cnflength&gt;</b>   Confirmed number of data bytes to be transmitted</p> <p><b>&lt;maxlength&gt;</b>   The max length of data can be sent at a time. It depends on the network status.</p> <p><b>&lt;error&gt;</b>        See "AT+FTPGET"</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max      Response  | 75 seconds(In case no response is received from server)  |

|           |  |
|-----------|--|
| Time      |  |
| Reference | Note<br>When "+FTPPUT: 1,1,<maxlength>" is shown, then use "AT+FTPPUT=2, <reqlength>" to write data. |

### 11.2.16 AT+FTPDELE Delete Specified File in FTP Server

| AT+FTPDELE Delete Specified File in FTP Server |   |
|--|---|
| Test Command<br><b>AT+FTPDELE=?</b>            | Response<br><b>OK</b>   |
|  | Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+FTPDELE</b>         | Response<br>If succeeded:<br><b>OK</b><br><br><b>+FTPDELE: 1,0</b><br><br>If failed:<br><b>OK</b><br><br><b>+FTPDELE: 1,&lt;error&gt;</b><br><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;error&gt;</b> See "AT+FTPGET"  |
| Parameter Saving Mode                          | NO_SAVE   |
| Max Response Time                              | 75 seconds(In case no response is received from server)   |
| Reference                                      | Note<br>The file to be deleted is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.  |

### 11.2.17 AT+FTPSIZE Get the Size of Specified File in FTP Server

| AT+FTPSIZE Get the Size of Specified File in FTP Server |                       |
|---|-----------------------|
| Test Command<br><b>AT+FTPSIZE=?</b>                     | Response<br><b>OK</b> |

|  |   |
|--|---|
|  | Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+FTPSIZE</b> | <p>Response</p> <p>If succeeded:<br/><b>OK</b></p> <p><b>+FTPSIZE: 1,0,&lt;size&gt;</b></p> <p>If failed:<br/><b>OK</b></p> <p><b>+FTPSIZE: 1,&lt;error&gt;,0</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;error&gt;</b> See "AT+FTPGET"</p> <p><b>&lt;size&gt;</b> The file size. Unit: byte</p> |
| Parameter Saving Mode                  | NO_SAVE   |
| Max Response Time                      | 75 seconds(In case no response is received from server)   |
| Reference                              | <p>Note</p> <p>The file is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.</p>   |

### 11.2.18 AT+FTPSTATE Get the FTP State

|   |  |
|---|--|
| <b>AT+FTPSTATE Get the FTP State</b>    |  |
| Test Command<br><b>AT+FTPSTATE=?</b>    | <p>Response</p> <p><b>OK</b></p> <p>Parameters<br/>See Execution Command</p>   |
| Execution Command<br><b>AT+FTPSTATE</b> | <p>Response</p> <p><b>+FTPSTATE: &lt;state&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> |

|                       |  |
|-----------------------|--|
|                       | Parameters<br><b>&lt;state&gt;</b><br>0 Idle<br>1 In the FTP session, including FTPGET, FTPPUT, FTPDELE and FTPSIZE operation. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

### 11.2.19 AT+FTPEXTPUT Extend Upload File

| AT+FTPEXTPUT Extend Upload File   |  |
|---|--|
| Test Command<br><b>AT+FTPEXTPUT=?</b>   | Response<br><b>OK</b>  |
| Write Command<br><b>AT+FTPEXTPUT=&lt;mode&gt;[,&lt;pos&gt;,&lt;len&gt;,&lt;timeout&gt;]</b> | <p>Response</p> <p>If mode is 0 or 1<br/><b>OK</b></p> <p>If mode is 2<br/><b>+FTPEXTPUT: &lt;address&gt;,&lt;len&gt;</b><br/>..... //Input data<br/><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>     0 use default FTPPUT method<br/>              1 use extend FTPPUT method<br/>              2 send data to RAM through serial port, then FTPPUT method will get the data from RAM.</p> <p><b>&lt;pos&gt;</b>     data offset address 0-300k</p> <p><b>&lt;len&gt;</b>     data length 0-300k</p> <p><b>&lt;timeout&gt;</b>   timeout value of serial port. 1000ms-1000000ms</p> <p><b>&lt;file name&gt;</b> File name length should less or equal 50 characters.</p> <p><b>&lt;err&gt;</b>     See "AT+FTPGET"</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | 75 seconds(In case no response is received from server)  |

|           |   |
|-----------|---|
| Reference | <p>Note</p> <ul style="list-style-type: none"> <li>When extend FTPPUT mode is activated, input data then execute "AT+FTPPUT=1" to transmit, after session is complete, if successful, it returns "+FTPPUT: 1,0", otherwise it returns "+FTPPUT: 1,&lt;error&gt;", &lt;error&gt; see "AT+FTPGET".</li> </ul> |
|-----------|---|

### 11.2.20 AT+FTPMKD Make Directory on the Remote Machine

| AT+FTPMKD Make Directory on the Remote Machine |  |
|--|--|
| Test Command<br>AT+FTPMKD=?                    | Response<br>OK   |
| Execution Command<br>AT+FTPMKD                 | <p>Response</p> <p>If success:</p> <p>OK</p> <p>+FTPMKD: 1,0</p> <p>If failed:</p> <p>OK</p> <p>+FTPMKD: 1,&lt;error&gt;</p> <p>If error is related to ME functionality:</p> <p>+CME ERROR: &lt;err&gt;</p> <p>Parameters</p> <p>&lt;error&gt; See "AT+FTPGET"</p> |
| Parameter Saving Mode                          | NO_SAVE  |
| Max Response Time                              | 75 seconds(In case no response is received from server)  |
| Reference                                      | <p>Note</p> <p>The created folder is specified by the "AT+FTPGETPATH" command.</p>   |

### 11.2.21 AT+FTPRMD Remove Directory on the Remote Machine

| AT+FTPRMD Remove Directory on the Remote Machine |  |
|--|--|
| Test Command<br>AT+FTPRMD=?                      | Response<br>OK                               |
| Execution Command<br>AT+FTPRMD                   | <p>Response</p> <p>If success:</p> <p>OK</p> |

|                            |  |
|----------------------------|--|
|                            | <p><b>+FTPRMD: 1,0</b></p> <p>If failed:<br/><b>OK</b></p> <p><b>+FTPRMD: 1,&lt;error&gt;</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;error&gt;</b>      See "AT+FTPGET"</p> |
| Parameter    Saving Mode   | NO_SAVE  |
| Max          Response Time | 75 seconds(In case no response is received from server)  |
| Reference                  | <p>Note</p> <p>The removed folder is specified by the "AT+FTPGETPATH" command.</p>   |

#### 11.2.22 AT+FTPLIST    List Contents of Directory on the Remote Machine

| AT+FTPLIST    List Contents of Directory on the Remote Machine      |   |
|---|---|
| Test Command<br><b>AT+FTPLIST=?</b>                                 | Response<br><b>OK</b>   |
| Write Command<br><b>AT+FTPLIST=&lt;mode&gt;[,&lt;reqlength&gt;]</b> | <p>Response</p> <p>If mode is 1 and it is a successful FTP get session:<br/><b>OK</b></p> <p><b>+FTPLIST: 1,1</b></p> <p>If data transfer is finished:<br/><b>+FTPLIST: 1,0</b></p> <p>If mode is 1 and it is a failed FTP get session:<br/><b>OK</b></p> <p><b>+FTPLIST: 1,&lt;error&gt;</b></p> <p>If mode is 2:<br/><b>+FTPLIST: 2,&lt;cnflength&gt;</b><br/><b>012345678...</b><br/><b>OK</b></p> |



|           |             |   |
|-----------|-------------|---|
|           |             | If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|           |             | Parameters<br><b>&lt;mode&gt;</b><br><ol style="list-style-type: none"> <li>1 For opening FTP get file list session</li> <li>2 For reading FTP file list</li> </ol> <b>&lt;reqlength&gt;</b> Requested number of data bytes (1-1460) to be read<br><b>&lt;cnflength&gt;</b> Confirmed number of data bytes to be read, which may be less than <reqlength>. 0 indicates that no data can be read.<br><b>&lt;error&gt;</b> See "AT+FTPGET"        |
| Parameter | Saving Mode | NO_SAVE   |
| Max Time  | Response    | 75 seconds(In case no response is received from server)   |
| Reference |             | Note <ul style="list-style-type: none"> <li>● When "+FTPLIST: 1,1" is shown, "AT+FTPLIST=2,&lt;reqlength&gt;" can be used to read data. If the module still has unread data, "+FTPLIST: 1,1" will be shown again in a certain time.</li> <li>● If using "AT+FTPGETPATH" to set a directory path, it will returned the files contents under this directory; if set a file path, it will return the information of the file specified.</li> </ul> |

### 11.2.23 AT+FTPTEXTGET Extend Download File

| AT+FTPTEXTGET Extend Download File  |  |
|---|--|
| Test Command<br><b>AT+FTPTEXTGET=?</b>  | Response<br><b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Read Command<br><b>AT+FTPTEXTGET?</b>   | Response<br><b>+FTPTEXTGET: &lt;mode&gt;,&lt;length&gt;</b><br><b>OK</b>             |
|   | Parameters<br>See Write Command  |
| Write Command<br>1) if mode is 0 or 1<br><b>AT+FTPTEXTGET=?</b><br><b>T=&lt;mode&gt;</b><br>3)if mode is 3<br><b>AT+FTPTEXTGET=?</b><br><b>T=&lt;mode&gt;,&lt;pos&gt;,&lt;len&gt;</b> | Response<br>If mode is 0:<br><b>OK</b>   |
|   | If mode is 1 and successfully download data:<br><b>OK</b><br><b>+FTPTEXTGET: 1,0</b> |

|                          |  |
|--------------------------|--|
|                          | <p>If mode is 1 and failed to download data:<br/><b>OK</b></p> <p><b>+FTPEXTGET: 1,&lt;error&gt;</b></p> <p>If mode is 3 and successfully download data:<br/><b>+FTPEXTGET: 3,&lt;length&gt;</b><br/><b>0123456...</b><br/><b>OK</b></p> <p>If &lt;file name&gt; is already exist in flash:<br/><b>ERROR</b></p>   |
|                          | <p>Parameters</p> <p><b>&lt;mode&gt;</b>     0    use default FTPGET method.<br/>                 1    open extend FTP get session and download data to RAM.<br/>                 3    read the downloaded data from RAM, then output it to the serial port.</p> <p><b>&lt;file name&gt;</b>   File name length should less than or equal to 50 characters.</p> <p><b>&lt;pos&gt;</b>        data offset should less than &lt;length&gt;.</p> <p><b>&lt;len&gt;</b>        data length 0-300k.</p> <p><b>&lt;length&gt;</b>    The length of the downloaded data from the remote machine.</p> <p><b>&lt;error&gt;</b>      See "AT+FTPGET"</p> |
| Parameter    Saving Mode | NO_SAVE  |
| Max        Response Time | 75 seconds(In case no response is received from server)  |
| Reference                | <p>Note</p> <ul style="list-style-type: none"> <li>● The data it can get is 300k at most.</li> </ul>   |

## 11.2.24 AT+FTPETPUT Upload File

| AT+FTPETPUT Upload File                          |   |
|--|---|
| Test Command<br><b>AT+FTPETPUT=?</b>             | <p>Response</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+FTPETPUT=&lt;mode&gt;</b> | <p>Response</p> <p>If mode is 1 and successfully open PUT session:<br/><b>OK</b></p> <p><b>+FTPETPUT: 1,1</b></p> <p>If mode is 1 and failed to open PUT session:</p> |

|                       |   |
|-----------------------|---|
|                       | <p><b>OK</b></p> <p><b>+FTPETPUT: 1,&lt;error&gt;</b></p> <p>If mode is 2:</p> <p><b>+FTPETPUT: 2,1</b></p> <p>...                   <i>//Input data</i></p> <p><b>&lt;ETX&gt;</b>               <i>//To notify the module that all data has been sent, switch from data mode to command mode</i></p> <p><b>OK</b></p> <p>If data transfer finished:</p> <p><b>+FTPETPUT: 1,0</b></p> <p>If data transfer failed:</p> <p><b>+FTPETPUT: 1,&lt;error&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>       1   For opening FTPETPUT session.<br/>              2   For writing FTP upload data.</p> <p><b>&lt;error&gt;</b>       See "AT+FTPEXTGET"</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>The TCP/IP stack will only interpret an &lt;ETX&gt; character as the end of the file to be transferred if it's not preceded by a &lt;DLE&gt; character. As a consequence the attached host must send &lt;ETX&gt; characters preceded by &lt;DLE&gt; characters and it must also code &lt;DLE&gt; characters in &lt;DLE&gt;&lt;DLE&gt;.</li> </ul>  |

### 11.2.25 AT+FTPGET Download File

| AT+FTPGET Download File |   |
|-------------------------|---|
| Test Command            | Response  |
| <b>AT+FTPGET</b>        | <b>OK</b>                                       |
| <b>=?</b>               | Parameters<br>See Write Command                 |
| Write Command           | Response  |
| <b>AT+FTPGET</b>        | If mode is 1 and successfully open GET session: |
| <b>=&lt;mode&gt;</b>    | <b>OK</b>                                       |
|                         | <b>+FTPGET: 1,1</b>                             |

|                       |  |
|-----------------------|--|
|                       | <p>If data transfer finished:</p> <p><b>0123456789...</b></p> <p><b>&lt;ETX&gt;</b>     <i>//To notify the user that all data transfer has been finished, switch from data mode to command mode.</i></p> <p><b>+FTPGET: 1,0</b></p> <p>If mode is 1 and failed to download data:</p> <p><b>OK</b></p> <p><b>+FTPGET: 1,&lt;error&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>     1    Open FTPGET session and download data.</p> <p><b>&lt;error&gt;</b>     See "AT+FTPEXTGET"</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>Each &lt;ETX&gt; character present in the payload data of the FTP flow will be coded by the TCP/IP stack on the serial port as &lt;DLE&gt;&lt;ETX&gt;. Each &lt;DLE&gt; character will be coded as &lt;DLE&gt;&lt;DLE&gt;. The attached host must then decode the FTP flow to remove these escape characters.</li> </ul>  |

### 11.2.26 AT+FTPQUIT Quit Current FTP Session

| AT+FTPQUIT Quit Current FTP Session |   |
|-------------------------------------|---|
| Test Command                        | Response  |
| <b>AT+FTPQUIT=?</b>                 | <b>OK</b>   |
| Execution Command                   | Response  |
| <b>AT+FTPQUIT</b>                   | <p>If the current operation is GET method:</p> <p><b>OK</b></p> <p><b>+FTPGET: 1,80</b></p> <p>If the current operation is PUT method:</p> <p><b>OK</b></p> <p><b>+FTPPUT: 1,80</b></p> <p>If FTP is in idle state:</p> |

|                       |              |
|-----------------------|--------------|
|                       | <b>ERROR</b> |
| Parameter Saving Mode | NO_SAVE      |
| Max Response Time     | -            |
| Reference             | Note         |

### 11.2.27 AT+FTPRENAME Rename the Specified File on the Remote Machine

| AT+FTPRENAME Rename the Specified File on the Remote Machine |   |
|--|---|
| Test Command<br><b>AT+FTRENAME=?</b>                         | Response<br><b>OK</b>   |
|  | Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+FTPRENAM E</b>                    | Response<br>If success:<br><b>OK</b><br><br><b>+FTPRENAME: 1,0</b><br><br>If failed:<br><b>OK</b><br><br><b>+FTPRENAME: 1,&lt;error&gt;</b><br><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameter<br><b>&lt;error&gt;</b> See "AT+FTPGET"   |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note <ul style="list-style-type: none"> <li>● The file is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.</li> <li>● The new file name is set by "AT+FTPPUTNAME" and "AT+FTPPUTPATH" command.</li> </ul>       |

## 11.2.28 AT+FTPMDTM Get the Last Modification Timestamp of Specified File on the Remote Machine

| AT+FTPMDTM Get the Last Modification Timestamp of Specified File on the Remote Machine |   |
|--|---|
| Test Command<br><b>AT+FTPMDTM=?</b>  | Response<br><b>OK</b>   |
|  | Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+FTPMDTM</b>   | Response<br>If success:<br><b>OK</b><br><br><b>+FTPMDTM: 1,0,&lt;timestamp&gt;</b><br><br>If failed:<br><b>OK</b><br><br><b>+FTPMDTM: 1,&lt;error&gt;</b><br><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameter<br><b>&lt;error&gt;</b> See "AT+FTPGET"<br><b>&lt;timestamp&gt;</b> The last modification timestamp of the specified file.  |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note<br>The file is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.  |

## 12 AT Command for NTP function

### 12.1 Overview

| Command    | Description                  |
|------------|------------------------------|
| AT+CNTPCID | Set GPRS bearer profile's ID |
| AT+CNTP    | Synthesize network time      |

### 12.2 Detailed Descriptions of Commands

#### 12.2.1 AT+CNTPCID Set GPRS Bearer Profile's ID

| AT+CNTPCID Set GPRS Bearer Profile's ID |   |
|---|---|
| Test Command<br>AT+CNTPCID=?            | Response<br>+ CNTPCID: (range of supported <cid>s)<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br>AT+CNTPCID?             | Response<br>+ CNTPCID: <cid><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CNTPCID=<cid>       | Response<br><br><b>OK</b><br>If error is related to ME functionality:<br><b>ERROR</b><br><br>Parameters<br><cid> Bearer profile identifier, refer to AT+SAPBR |
| Parameter Saving Mode                   | -   |
| Max Response Time                       | -   |
| Reference                               | Note  |

#### 12.2.2 AT+CNTP Synchronize Network Time

AT+CNTP Synchronize Network Time

|   |   |
|---|---|
| <p>Test Command<br/><b>AT+CNTP=?</b></p>  | <p>Response<br/><b>+CNTP:</b> (length of <b>&lt;ntp server&gt;</b>),(range of <b>&lt;time zone&gt;</b>),(range of <b>&lt;cid&gt;</b>), (range of <b>&lt;mode&gt;</b>)</p> <p><b>OK</b></p> <p>Parameter<br/>See Write Command</p>   |
| <p>Read Command<br/><b>AT+CNTP?</b></p>   | <p>Response<br/><b>+ CNTP:</b> <b>&lt;ntp sever&gt;</b>,<b>&lt;time zone&gt;</b>,<b>&lt;cid&gt;</b>,<b>&lt;mode&gt;</b></p> <p><b>OK</b></p> <p>Parameter<br/>See Write Command</p>   |
| <p>Write Command<br/><b>AT+CNTP=&lt;ntp server&gt;[,&lt;time zone&gt;][,&lt;cid&gt;][,&lt;mode&gt;]</b></p> | <p>Response<br/><b>OK</b></p> <p>Parameter</p> <p><b>&lt;ntp server&gt;</b>      NTP server's url</p> <p><b>&lt;time zone&gt;</b>      Local time zone, the range is (-47 to 48), in fact, time zone range (-12 to 12), but taking into account that some countries and regions will use half time zone, or even fourth time zone, so the entire extended four time zones X, so that when the time zone of the input integers are used, without the need for decimal. Time zone in front of the West if it is a negative number indicates the time zone.</p> <p><b>&lt;cid&gt;</b>              Bearer profile identifier, refer to AT+SAPBR</p> <p><b>&lt;mode&gt;</b>            print network time on uart and set to local time</p> <p>          0      Just set network to localtime</p> <p>          1      Just output network time to AT port</p> <p>          2      Set network to localtime and output network time to AT port</p> |
| <p>Execution command<br/><b>AT+CNTP</b></p>   | <p>Response<br/><b>OK</b></p> <p><b>+CNTP:</b> <b>&lt;code&gt;</b>[,<b>&lt;time&gt;</b>]</p> <p>Parameter</p> <p><b>&lt;code&gt;</b>            1    Network time synchronization is successful<br/>                      61    Network Error<br/>                      62    DNS resolution error<br/>                      63    Connection Erro<br/>                      64    Service response error<br/>                      65    Service Response Timeout</p> <p><b>&lt;time&gt;</b>      Network time</p>   |
| <p>Parameter      Saving Mode</p>   | <p>-</p>  |



|                   |   |
|-------------------|---|
| Max Response Time | -   |
| Reference         | <p>Note</p> <ul style="list-style-type: none"><li>● After successful synchronization time, you can use AT+CCLK to query local time.</li></ul> |

## 13 AT Commands for OneNet Application

### 13.1 Overview

| Command             | Description                        |
|---------------------|------------------------------------|
| AT+MIPLCREATE       | Create OneNet configuration        |
| AT+MIPLDELETE       | Delete OneNet configuration        |
| AT+MIPLOPEN         | Connect to OneNet                  |
| AT+MIPLADDOBJ       | Add object                         |
| AT+MIPLDELOBJ       | Delete object                      |
| AT+MIPLCLOSE        | Disconnect to OneNet               |
| AT+MIPLNOTIFY       | Notify data to OneNet              |
| AT+MIPLREADRSP      | Send response on read command      |
| AT+MIPLWRITERSP     | Send response on write command     |
| AT+MIPLEXECUTERSP   | Send response on execute command   |
| AT+MIPLOBSERVERSP   | Send response on observe command   |
| AT+MIPLDISCOVERRSP  | Send response on discover command  |
| AT+MIPLPARAMETERRSP | Send response on parameter command |
| AT+MIPLUPDATE       | Update registration                |
| AT+MIPLVER          | Version of OneNet SDK              |
| AT+MIPLBOOTSTRAP    | Bootstrap mode                     |
| +MIPLREAD           | Read request to user               |
| +MIPLWRITE          | Write request to user              |
| +MIPLEXECUTE        | Execute request to user            |
| +MIPLOBSERVE        | Observe request to user            |
| +MIPLDISCOVER       | Discover request to user           |
| +MIPLPARAMETER      | Set parameter request to user      |
| +MIPLEVENT          | Event indication to user           |

### 13.2 Detailed Descriptions of Commands

#### 13.2.1 AT+MIPLCREATE Create OneNet configuration

| AT+MIPLCREATE Create OneNet configuration |   |
|---|---|
| Test Command                              | Response  |
| AT+MIPLCREAT<br>E=?                       | +MIPLCREATE: <size>,<config>,<index>,<totalsize>,<flag> |

|  |  |
|--|--|
|  | <b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Execution Command<br><b>AT+MIPLCREATE</b>  | Response<br><ref><br><b>OK</b>   |
| Write Command<br><b>AT+MIPLCREATE=&lt;size&gt;,&lt;config&gt;,&lt;index&gt;,&lt;totalsize&gt;,&lt;flag&gt;</b> | Response<br><ref><br><b>OK</b><br>Parameters<br><size> Current <config> size<br><config> Config in hex format<br><index> Current config index<br><totalsize> Total config size<br><flag> Indicate the input is over or not |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

### 13.2.2 AT+MIPLDELETE Delete OneNet configuration

| <b>AT+MIPLDELETE</b>                              | <b>Delete OneNet configuration</b>  |
|---|---|
| Test Command<br><b>AT+MIPLDELETE=?</b>            | Response<br><b>+MIPLDELETE: &lt;ref&gt;</b><br><b>OK</b><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+MIPLDELETE=&lt;ref&gt;</b> | Response<br><b>OK</b><br>Parameters<br><ref> Config id                                      |
| Parameter Saving Mode                             | NO_SAVE   |
| Max Response Time                                 | -   |
| Reference   | Note  |

### 13.2.3 AT+MIPLOPEN Connect to OneNet

| AT+MIPLOPEN Connect to OneNet   |  |
|---|--|
| Test Command<br><b>AT+MIPLOPEN=?</b>  | Response<br><b>+MIPLOPEN: &lt;ref&gt;,&lt;lifetime&gt;,&lt;param&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+MIPLOPEN=</b><br><b>&lt;ref&gt;,&lt;lifetime&gt;,&lt;param&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><ref> Config id<br><lifetime> Lifetime to update automatically<br><param> Reserved    |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 13.2.4 AT+MIPLADDOBJ Add object

| AT+MIPLADDOBJ Add object  |  |
|---|--|
| Test Command<br><b>AT+MIPLADDOBJ=</b><br><b>J=?</b>   | Response<br><b>+MIPLADDOBJ:</b><br><b>&lt;ref&gt;,&lt;objectid&gt;,&lt;instancecount&gt;,&lt;instanceBitmap&gt;,&lt;attributeCount&gt;,&lt;actionCount&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command                                   |
| Write Command<br><b>AT+MIPLADDOBJ=</b><br><b>J=&lt;ref&gt;,&lt;objectid&gt;,&lt;instancecount&gt;,&lt;instanceBitmap&gt;,&lt;attributeCount&gt;,&lt;actionCount&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><ref> Config id<br><objectid> Object id<br><instancecount> Count of instance<br><instanceBitmap> Bitmap of instance<br><attributeCount> Count of attribute resource<br><actionCount> Count of action resource |
| Parameter Saving Mode   | NO_SAVE  |

|                   |      |
|-------------------|------|
| Max Response Time | -    |
| Reference         | Note |

### 13.2.5 AT+MIPLDELOBJ Delete Object

| AT+MIPLDELOBJ Delete object  |   |
|--|---|
| Test Command<br><b>AT+MIPLDELOBJ=?</b>                             | Response<br><b>+MIPLDELOBJ: &lt;ref&gt;,&lt;objectid&gt;</b>                  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLDELOBJ=&lt;ref&gt;,&lt;objectid&gt;</b> | Response<br><b>OK</b>   |
|  | Parameters<br><b>&lt;ref&gt;</b> Config id<br><b>&lt;object&gt;</b> Object id |
|  | Parameter Saving Mode<br>NO_SAVE  |
| Max Response Time  | -   |
| Reference  | Note  |

### 13.2.6 AT+MIPLCLOSE Disconnect to OneNet

| AT+MIPLCLOSE Disconnect to OneNet                |  |
|--|--|
| Test Command<br><b>AT+MIPLCLOSE=?</b>            | Response<br><b>+MIPLCLOSE: &lt;ref&gt;</b> |
|  | <b>OK</b>                                  |
|  | Parameters<br>See Write Command            |
| Write Command<br><b>AT+MIPLCLOSE=&lt;ref&gt;</b> | Response<br><b>OK</b>                      |
|  | Parameters<br><b>&lt;ref&gt;</b> Config id |
|  | Parameter Saving Mode<br>NO_SAVE           |
| Max Response Time                                | -  |
| Reference  | Note                                       |

### 13.2.7 AT+MIPLNOTIFY Notify Data to OneNet

| AT+MIPLNOTIFY Notify Data to OneNet   |  |
|---|--|
| Test Command<br><b>AT+MIPLNOTIFY=?</b>  | Response<br><b>+MIPLNOTIFY:</b><br><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;[,&lt;ackid&gt;]</b><br><br><b>OK</b>   |
| Write Command<br><b>AT+MIPLNOTIFY=&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;[,&lt;ackid&gt;]</b> | Parameters<br><b>OK</b><br><br>Parameters<br><b>&lt;ref&gt;</b> Config id<br><b>&lt;objectid&gt;</b> Object id<br><b>&lt;instanceid&gt;</b> Instance id<br><b>&lt;resourceid&gt;</b> Resource id<br><b>&lt;valuetype&gt;</b> Type of value<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Bool<br><b>&lt;len&gt;</b> Length<br><b>&lt;value&gt;</b> Value string<br><b>&lt;index&gt;</b> Index of current input<br><b>&lt;flag&gt;</b> Indicate the input is over or not<br><b>&lt;ackid&gt;</b> Need ack or not |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 13.2.8 AT+MIPLREADRSP Send Response on Read Command

| AT+MIPLREADRSP Send Response on Read Command |   |
|--|---|
| Test Command<br><b>AT+MIPLREADRSP=?</b>      | Response<br><b>+MIPLREADRSP:</b><br><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;</b> |

|   |  |
|---|--|
|   | <b>OK</b><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLREADRSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;index&gt;,&lt;flag&gt;</b> | Response<br><b>OK</b><br>Parameters<br><ref> Config id<br><msgid> Message id<br><result> Result<br><objectid> Object id<br><instanceid> Instance id<br><resourceid> Resource id<br><valuetype> Type of value<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Bool<br><len> Length<br><value> Value string<br><index> Index of current input<br><flag> Indicate the input is over or not |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 13.2.9 AT+MIPLWRITERSP Send Response on Write Command

| AT+MIPLWRITERSP Send Response on Write Command                                   |  |
|--|--|
| Test Command<br><b>AT+MIPLWRITERSP=?</b>   | Response<br><b>+MIPLWRITERSP: &lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b><br><b>OK</b><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+MIPLWRITERSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | Response<br><b>OK</b><br>Parameters<br><ref> Config id<br><msgid> Message id<br><result> Result                            |

|                       |         |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     | -       |
| Reference             | Note    |

### 13.2.10 AT+MIPLEXECUTERSP Send Response on Execute Command

| AT+MIPLEXECUTERSP Send Response on Execute Command                                 |   |                    |           |                      |            |                       |        |
|--|---|--------------------|-----------|----------------------|------------|-----------------------|--------|
| Test Command<br><b>AT+MIPLEXECUTERSP=?</b>   | <p>Response<br/><b>+MIPLEXECUTERSP: &lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |                    |           |                      |            |                       |        |
| Write Command<br><b>AT+MIPLEXECUTERSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | <p>Response<br/><b>OK</b></p> <p>Parameters</p> <table> <tr> <td><b>&lt;ref&gt;</b></td><td>Config id</td></tr> <tr> <td><b>&lt;msgid&gt;</b></td><td>Message id</td></tr> <tr> <td><b>&lt;result&gt;</b></td><td>Result</td></tr> </table> | <b>&lt;ref&gt;</b> | Config id | <b>&lt;msgid&gt;</b> | Message id | <b>&lt;result&gt;</b> | Result |
| <b>&lt;ref&gt;</b>   | Config id   |                    |           |                      |            |                       |        |
| <b>&lt;msgid&gt;</b>   | Message id  |                    |           |                      |            |                       |        |
| <b>&lt;result&gt;</b>  | Result  |                    |           |                      |            |                       |        |
| Parameter Saving Mode  | NO_SAVE   |                    |           |                      |            |                       |        |
| Max Response Time  | -   |                    |           |                      |            |                       |        |
| Reference  | Note  |                    |           |                      |            |                       |        |

### 13.2.11 AT+MIPLOBSERVERSP Send Response On Observe Command

| AT+MIPLOBSERVERSP Send Response on Observe Command                                 |   |                    |           |                      |            |                       |        |
|--|---|--------------------|-----------|----------------------|------------|-----------------------|--------|
| Test Command<br><b>AT+MIPLOBSERVERSP=?</b>   | <p>Response<br/><b>+MIPLOBSERVERSP: &lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |                    |           |                      |            |                       |        |
| Write Command<br><b>AT+MIPLOBSERVERSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | <p>Response<br/><b>OK</b></p> <p>Parameters</p> <table> <tr> <td><b>&lt;ref&gt;</b></td><td>Config id</td></tr> <tr> <td><b>&lt;msgid&gt;</b></td><td>Message id</td></tr> <tr> <td><b>&lt;result&gt;</b></td><td>Result</td></tr> </table> | <b>&lt;ref&gt;</b> | Config id | <b>&lt;msgid&gt;</b> | Message id | <b>&lt;result&gt;</b> | Result |
| <b>&lt;ref&gt;</b>   | Config id   |                    |           |                      |            |                       |        |
| <b>&lt;msgid&gt;</b>   | Message id  |                    |           |                      |            |                       |        |
| <b>&lt;result&gt;</b>  | Result  |                    |           |                      |            |                       |        |



|                       |         |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     | -       |
| Reference             | Note    |

### 13.2.12 AT+MIPLDISCOVERERRSP Send Response on Discover Command

| AT+MIPLDISCOVERERRSP Send Response on Discover Command   |   |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
|--|---|--------------------------|-----------|----------------------------|------------|-----------------------------|--------|-----------------------------|----------------------|----------------------------------|--------------------|
| Test Command<br><b>AT+MIPLDISCOVERERRSP=?</b>  | <p>Response</p> <p><b>+MIPLDISCOVERERRSP:</b><br/> <code>&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;length&gt;,&lt;valuestring&gt;</code></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| Write Command<br><b>AT+MIPLDISCOVERERRSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;length&gt;,&lt;valuestring&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <table> <tr> <td><code>&lt;ref&gt;</code></td><td>Config id</td></tr> <tr> <td><code>&lt;msgid&gt;</code></td><td>Message id</td></tr> <tr> <td><code>&lt;result&gt;</code></td><td>Result</td></tr> <tr> <td><code>&lt;length&gt;</code></td><td>Number of resourceid</td></tr> <tr> <td><code>&lt;valuestring&gt;</code></td><td>Resource id string</td></tr> </table> | <code>&lt;ref&gt;</code> | Config id | <code>&lt;msgid&gt;</code> | Message id | <code>&lt;result&gt;</code> | Result | <code>&lt;length&gt;</code> | Number of resourceid | <code>&lt;valuestring&gt;</code> | Resource id string |
| <code>&lt;ref&gt;</code>   | Config id   |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| <code>&lt;msgid&gt;</code>   | Message id  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| <code>&lt;result&gt;</code>  | Result  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| <code>&lt;length&gt;</code>  | Number of resourceid  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| <code>&lt;valuestring&gt;</code>   | Resource id string  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| Parameter Saving Mode  | NO_SAVE   |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| Max Response Time  | -   |                          |           |                            |            |                             |        |                             |                      |                                  |                    |
| Reference  | Note  |                          |           |                            |            |                             |        |                             |                      |                                  |                    |

### 13.2.13 AT+MIPLPARAMETERRSP Send Response on Parameter Command

| AT+MIPLPARAMETERRSP Send Response on Parameter Command                               |   |
|--|---|
| Test Command<br><b>AT+MIPLPARAMETERRSP=?</b>   | <p>Response</p> <p><b>+MIPLPARAMETERRSP:</b> <code>&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</code></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Write Command<br><b>AT+MIPLPARAMETERRSP=&lt;ref&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p>  |

|                       |   |
|-----------------------|---|
|                       | <b>&lt;ref&gt;</b> Config id<br><b>&lt;msgid&gt;</b> Message id<br><b>&lt;result&gt;</b> Result |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

### 13.2.14 AT+MIPLUPDATE Update Registration

| AT+MIPLUPDATE Update Registration   |   |
|---|---|
| Test Command<br><b>AT+MIPLUPDAT<br/>E=?</b>   | Response<br><b>+MIPLUPDATE: &lt;ref&gt;,&lt;lifetime&gt;,&lt;flag&gt;</b><br><br><b>OK</b><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLUPDAT<br/>E=&lt;ref&gt;,&lt;lifetime&gt;<br/>,&lt;flag&gt;</b> | Response<br><b>OK</b><br>Parameters<br><b>&lt;ref&gt;</b> Config id<br><b>&lt;lifetime&gt;</b> Lifetime to update<br><b>&lt;flag&gt;</b> Update with object update or not |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

### 13.2.15 AT+MIPLVER Version of OneNet SDK

| AT+MIPLVER Version of OneNet SDK   |  |
|------------------------------------|--|
| Read Command<br><b>AT+MIPLVER?</b> | Response<br><b>+MIPLVER: &lt;version&gt;</b><br><br><b>OK</b><br>Parameters<br><b>&lt;version&gt;</b> Version of SDK |
| Parameter Saving Mode              | -  |
| Max Response Time                  | -  |

|           |      |
|-----------|------|
| Reference | Note |
|-----------|------|

### 13.2.16 AT+MIPLBOOTSTRAP Bootstrap Mode

| AT+MIPLBOOTSTRAP Bootstrap Mode                            |  |
|--|--|
| Write Command<br><b>AT+MIPLBOOTS<br/>TRAP=&lt;mode&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;mode&gt;</b> Bootstrap mode<br>0    Disable<br>1    Enable |
| Parameter    Saving<br>Mode                                | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

### 13.2.17 +MIPLREAD Read Request to User

| +MIPLREAD Read Request to User |  |
|--------------------------------|--|
|                                | Response<br><b>+MIPLREAD:</b><br><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;</b><br><br>Parameters<br><b>&lt;ref&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE<br><b>&lt;msgid&gt;</b> Integer, message id<br><b>&lt;objectid&gt;</b> Integer, object id<br><b>&lt;instanceid&gt;</b> Integer, instance id, read all resources of all instances of the object if instanceid equals -1<br><b>&lt;resourceid&gt;</b> Integer, resource id, read all resources of the instance if resourceid equals -1 |

### 13.2.18 +MIPLWRITE Write Request to User

| +MIPLWRITE Write Request to User |  |
|----------------------------------|--|
|                                  | Response<br><b>+ MIPLWRITE:</b><br><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;valuetype&gt;,&lt;len&gt;,&lt;value&gt;,&lt;flag&gt;,&lt;index&gt;</b><br><br>Parameters<br><b>&lt;ref&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE<br><b>&lt;msgid&gt;</b> Integer, message id |

|  |  |
|--|--|
|  | <p><b>&lt;objectid&gt;</b> Integer, object id</p> <p><b>&lt;instanceid&gt;</b> Integer, instance id</p> <p><b>&lt;resourceid&gt;</b> Integer, resource id</p> <p><b>&lt;valuetype&gt;</b> Integer, write data value type</p> <p>1 String</p> <p>2 Opaque</p> <p>3 Integer</p> <p>0 Float</p> <p>5 Bool</p> <p><b>&lt;len&gt;</b> Integer, write data length. It can be omitted, if valuetype is Integer or Float, or Bool</p> <p><b>&lt;value&gt;</b> Integer, write data value</p> <p><b>&lt;flag&gt;</b> Integer, message flag</p> <p>1 First message;</p> <p>2 Middle message;</p> <p>0 Last message</p> <p><b>&lt;index&gt;</b> Integer, message index, from 0 to 1024</p> |
|--|--|

### 13.2.19 +MIPLEXECUTE Execute Request to User

| <b>+MIPLEXECUTE Execute Request to User</b> |   |
|---|---|
|   | <p>Response</p> <p><b>+MIPLEXECUTE:</b></p> <p><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;len&gt;,&lt;arguments&gt;</b></p>  |
|   | <p>Parameters</p> <p><b>&lt;ref&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE</p> <p><b>&lt;msgid&gt;</b> Integer, message id</p> <p><b>&lt;objectid&gt;</b> Integer, object id</p> <p><b>&lt;instanceid&gt;</b> Integer, instance id</p> <p><b>&lt;resourceid&gt;</b> Integer, resource id</p> <p><b>&lt;len&gt;</b> Integer, parameter length</p> <p><b>&lt;arguments&gt;</b> String, parameter string</p> |

### 13.2.20 +MIPLOBERVE Observe Request to User

| <b>+MIPLOBERVE Observe Request to User</b> |  |
|--|--|
|  | <p>Response</p> <p><b>+ MIPLOBERVE:</b></p> <p><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;flag&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;</b></p>  |
|  | <p>Parameters</p> <p><b>&lt;ref&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE</p> <p><b>&lt;msgid&gt;</b> Integer, message id</p> <p><b>&lt;flag&gt;</b> Integer, observe flag.</p> |

|  |  |
|--|--|
|  | <p>1 Indicates observe</p> <p>0 Indicates cancel observe</p> <p>&lt;objectid&gt; Integer, object id</p> <p>&lt;instanceid&gt; Integer, instance id, observe all resources of all instances of the object if instanceid equals -1</p> <p>&lt;resourceid&gt; Integer, resource id, observe all resources of the instance if resourceid equals -1</p> |
|--|--|

### 13.2.21 +MIPLDISCOVER Discover Request to User

| +MIPLDISCOVER Discover Request to User |   |
|--|---|
|  | <p>Response</p> <p><b>+MIPLDISCOVER: &lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;</b></p>   |
|  | <p>Parameters</p> <p>&lt;ref&gt; Integer, OneNET instance returned by AT+MIPLCREATE</p> <p>&lt;msgid&gt; Integer, message id</p> <p>&lt;objectid&gt; Integer, object id</p> |

### 13.2.22 +MIPLPARAMETER Set Parameter Request to User

| +MIPLPARAMETER Set Parameter Request to User |   |
|--|---|
|  | <p>Response</p> <p><b>+MIPLPARAMETER:</b></p> <p><b>&lt;ref&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;len&gt;,&lt;parameter&gt;</b></p>  |
|  | <p>Parameters</p> <p>&lt;ref&gt; Integer, OneNET instance returned by AT+MIPLCREATE</p> <p>&lt;msgid&gt; Integer, message id</p> <p>&lt;objectid&gt; Integer, object id</p> <p>&lt;instanceid&gt; Integer, instance id, observe all resources of all instances of the object if instanceid equals -1</p> <p>&lt;resourceid&gt; Integer, resource id, observe all resources of the instance if resourceid equals -1</p> <p>&lt;len&gt; Integer, parameter length</p> <p>&lt;parameter&gt; String, parameter string, must start with "and end with" pmin=xxx; pmax=xxx; gt=xxx; lt=xxx; stp=xxx</p> |

### 13.2.23 +MIPLEVENT Event Indication to User

| +MIPLEVENT Event Indication to User |   |
|-------------------------------------|---|
|                                     | <p>Response</p> <p><b>+MIPLEVENT: &lt;ref&gt;,&lt;evtid&gt;</b></p>                     |
|                                     | <p>Parameters</p> <p>&lt;ref&gt; Integer, OneNET instance returned by AT+MIPLCREATE</p> |

| <evtid> | Integer, event id |
|---------|-------------------|
| 1       | BOOTSTRAP_START   |
| 2       | BOOTSTRAP_SUCCESS |
| 3       | BOOTSTRAP_FAILED  |
| 4       | CONNECT_SUCCESS   |
| 5       | CONNECT_FAILED    |
| 6       | REG_SUCCESS       |
| 7       | REG_FAILED        |
| 8       | REG_TIMEOUT       |
| 9       | LIFETIME_TIMEOUT  |
| 10      | STATUS_HALT       |
| 11      | UPDATE_SUCCESS    |
| 12      | UPDATE_FAILED     |
| 13      | UPDATE_TIMEOUT    |
| 14      | UPDATE_NEED       |
| 15      | UNREG_DONE        |
| 20      | RESPONSE_FAILED   |
| 21      | RESPONSE_SUCCESS  |
| 25      | NOTIFY_FAILED     |
| 26      | NOTIFY_SUCCESS    |

## 14 AT Commands for Telecom IOT Application

### 14.1 Overview

| Command       | Description               |
|---------------|---------------------------|
| AT+SIMLCREATE | Create configuration      |
| AT+SIMLMODE   | Connection mode           |
| AT+SIMLOPEN   | Connect to Telecom IOT    |
| AT+SIMLSEND   | Send data to Telecom IOT  |
| AT+SIMLCLOSE  | Disconnect to Telecom IOT |

### 14.2 Detailed Descriptions of Commands

#### 14.2.1 AT+SIMLCREATE Create Configuration

| AT+SIMLCREATE Create Configuration          |  |
|---|--|
| Test Command<br>AT+SIMLCREAT<br>E=?         | Response<br>+SIMLCREATE: <config><br><br>OK<br><br>Parameters<br>See Write Command |
| Write Command<br>AT+SIMLCREAT<br>E=<config> | Response<br>OK<br><br>Parameters<br><config> Config in hex format                  |
| Parameter Saving<br>Mode                    | NO_SAVE  |
| Max Response Time                           | -  |
| Reference                                   | Note   |

#### 14.2.2 AT+SIMLMODE Connection Mode

| AT+SIMLMODE Connection Mode       |   |
|-----------------------------------|---|
| Test Command<br>AT+SIMLMODE=<br>? | Response<br>+SIMLMODE: <mode><br><br>OK |

|   |  |
|---|--|
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+SIMLMODE=</b><br><b>&lt;mode&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;mode&gt;</b> Connection mode<br><u>1</u> Other<br>2    China Telecom IOT |
| Parameter      Saving<br>Mode                               | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

#### 14.2.3 AT+SIMLOPEN Connect to Telecom IOT

| <b>AT+SIMLOPEN Connect to Telecom IOT</b>                       |  |
|---|--|
| Test Command<br><b>AT+SIMLOPEN=?</b>                            | Response<br><b>+SIMLOPEN: &lt;lifetime&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+SIMLOPEN=&lt;</b><br><b>lifetime&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;lifetime&gt;</b> Reserved                            |
| Parameter      Saving<br>Mode                                   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

#### 14.2.4 AT+SIMLSEND Send Data to Telecom IOT

| <b>AT+SIMLSEND Send Data to Telecom IOT</b> |   |
|---|---|
| Test Command<br><b>AT+SIMLSEND=?</b>        | Response<br><b>+SIMLSEND: &lt;data&gt;,&lt;flag&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |



|   |   |
|---|---|
| Write Command<br><b>AT+SIMLSEND=&lt;data&gt;,&lt;flag&gt;</b> | Response<br><b>OK</b>   |
|   | Parameters<br><b>&lt;data&gt;</b> String in hex format<br><b>&lt;flag&gt;</b><br>0      Input over<br>1      Input not over |
| Parameter    Saving Mode                                      | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

#### 14.2.5 AT+SIMLCLOSE    Disconnect to Telecom IOT

| <b>AT+SIMLCLOSE    Disconnect to Telecom IOT</b> |                       |
|--|-----------------------|
| Execution Command<br><b>AT+SIMLCLOSE</b>         | Response<br><b>OK</b> |
|  | Parameters            |
| Parameter    Saving Mode                         | -                     |
| Max Response Time                                | -                     |
| Reference  | Note                  |

## 15 AT Commands for GNSS Application

SIM7000 series modules provide GNSS AT command is as follows:

### 15.1 Overview

| Command     | Description  |
|-------------|--|
| AT+CGNSPWR  | GNSS Power Control                                     |
| AT+CGNSINF  | GNSS Navigation Information Parsed From NMEA Sentences |
| AT+CGNSURC  | GNSS Navigation URC Report                             |
| AT+CGNSPORT | GNSS NMEA Out Port Set                                 |
| AT+CGNSCOLD | GNSS Cold Start  |
| AT+CGNSWARM | GNSS Warm Start  |
| AT+CGNSHOT  | GNSS Hot Start   |
| AT+CGNSMOD  | GNSS Work Mode Set                                     |
| AT+CGNSCFG  | GNSS NMEA Out Configure                                |
| AT+CGNSTST  | GNSS NMEA Data Out Put To AT Port                      |
| AT+CGNSXTRA | GNSS XTRA Function Open                                |
| AT+CGNSCPY  | GNSS XTRA File Copy                                    |
| AT+CGNSRTMS | GNSS NMEA out frequency configure                      |

## 15.2 Detailed Descriptions of Commands

### 15.2.1 AT+CGNSPWR GNSS Power Control

| AT+CGNSPWR GNSS Power Control                   |   |
|---|---|
| Test Command<br><b>AT+CGNSPWR=?</b>             | Response<br><b>+CGNSPWR:</b> (list of supported <mode>s )<br><br><b>OK</b><br><br>Parameters<br>See Write Command                                 |
| Read Command<br><b>AT+CGNSPWR?</b>              | Response<br>TA returns the current status of GNSS Power supply<br><b>+CGNSPWR:</b> <mode><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+CGNSPWR=&lt;mode&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><mode><br>0 Turn off GNSS power supply<br>1 Turn on GNSS power supply            |
| Parameter Saving Mode                           | NO_SAVE   |
| Max Response Time                               | -   |
| Reference                                       | NMEA data will not out put to usb's NMEA port when set AT+CGNSPWR=1 through uart port except config it by AT+CGNSCFG=1.                           |

### 15.2.2 AT+CGNSINF GNSS Navigation Information Parsed From NMEA Sentences

| AT+CGNSINF GNSS Navigation Information Parsed From NMEA Sentences |  |
|---|--|
| Test Command<br><b>AT+CGNSINF=?</b>                               | Response<br><b>OK</b><br><br>Parameters<br>See Execution Command |
| Execution   | Response   |

|                       |  |
|-----------------------|--|
| Command<br>AT+CGNSINF | +CGNSINF: <GNSS run status>,<Fix status>,<UTC date & Time>,<Latitude>,<Longitude>,<MSL Altitude>,<Speed Over Ground>,<Course Over Ground>,<Fix Mode>,<Reserved1>,<HDOP>,<PDOP>,<VDOP>,<Reserved2>,<GNSS Satellites in View>,<GNSS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA><br><br><b>OK</b><br><br>Parameters<br><GNSS run status><br>0 GNSS off<br>1 GNSS on<br><Fix status><br>0 Not fixed position<br>1 Fixed position<br>See below table 2-3. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             |  |

Table 2-1: AT+CGNSINF return Parameters

| Index | Parameter          | Unit                   | Range   | Length |
|-------|--------------------|------------------------|---|--------|
| 1     | GNSS run status    | --                     | 0-1   | 1      |
| 2     | Fix status         | --                     | 0-1   | 1      |
| 3     | UTC date & Time    | yyyyMMddhh<br>mmss.sss | yyyy: [1980,2039]<br>MM : [1,12]<br>dd: [1,31]<br>hh: [0,23]<br>mm: [0,59]<br>ss.sss:[0.000,60.999] | 18     |
| 4     | Latitude           | ±dd.ddd ddd            | [-90.000000,90.000000]  | 10     |
| 5     | Longitude          | ±ddd.ddd ddd           | [-180.000000,180.000000]  | 11     |
| 6     | MSL Altitude       | meters                 |   | 8      |
| 7     | Speed Over Ground  | Km/hour                | [0,999.99]  | 6      |
| 8     | Course Over Ground | degrees                | [0,360.00]  | 6      |
| 9     | Fix Mode           | --                     | 0,1,2 <sup>[1]</sup>  | 1      |
| 10    | Reserved1          |                        |   | 0      |
| 11    | HDOP               | --                     | [0,99.9]  | 4      |

# Smart Machine Smart Decision

|                   |                            |        |            |   |
|-------------------|----------------------------|--------|------------|---|
| 12                | PDOP                       | --     | [0,99.9]   | 4 |
| 13                | VDOP                       | --     | [0,99.9]   | 4 |
| 14                | Reserved2                  |        |            | 0 |
| 15                | GPS Satellites in View     | --     | [0,99]     | 2 |
| 16                | GNSS Satellites Used       | --     | [0,99]     | 2 |
| 17                | GLONASS Satellites in View | --     | [0,99]     | 2 |
| 18                | Reserved3                  |        |            | 0 |
| 19                | C/N0 max                   | dBHz   | [0,55]     | 2 |
| 20                | HPA <sup>[2]</sup>         | meters | [0,9999.9] | 6 |
| 21                | VPA <sup>[2]</sup>         | meters | [0,9999.9] | 6 |
| Total: (94) chars |                            |        |            |   |

### 15.2.3 AT+CGNSURC GNSS Navigation URC Report

| AT+CGNSURC   | GNSS Navigation URC Report   |
|--|--|
| Test Command<br><b>AT+CGNSURC=?</b>                        | <p>Response</p> <p><b>+CGNSURC: (0-255)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CGNSURC?</b>                         | <p>Response</p> <p>TA returns the current URC setting</p> <p><b>+CGNSURC: &lt;Navigation mode&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> <p>Unsolicited Result Code</p> <p><b>+UGNSINF: &lt;GNSS run status&gt;,&lt;Fix status&gt;,&lt;UTC date &amp; Time&gt;,&lt;Latitude&gt;,&lt;Longitude&gt;,&lt;MSL Altitude&gt;,&lt;Speed Over Ground&gt;,&lt;Course Over Ground&gt;,&lt;Fix Mode&gt;,&lt;Reserved1&gt;,&lt;HDOP&gt;,&lt;PDOP&gt;,&lt;VDOP&gt;,&lt;Reserved2&gt;,&lt;Satellites in View&gt;,&lt;Satellites Used&gt;,&lt;Reserved3&gt;,&lt;C/N0 max&gt;,&lt;HPA&gt;,&lt;VPA&gt;</b></p> |
| Write Command<br><b>AT+CGNSURC=&lt;Navigation mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;Navigation mode&gt;:</b></p> <p>0 Turn off navigation data URC report</p> <p>1 Turn on navigation data URC report, and report every GNSS FIX</p> <p>2 Turn on navigation data URC report, and report every 2 GNSS FIX</p> <p>...</p> <p>255 Turn on navigation data URC report, and report every 255 GNSS FIX</p>   |
| Parameter Saving Mode                                      | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | <p>Note</p> <ul style="list-style-type: none"> <li>Factory setting is "AT+CGNSURC=0".</li> <li>URC "+UGNSINF: "parameters are the same as "+CGNSINF:" return.</li> </ul>   |

#### 15.2.4 AT+CGNSPORT GNSS NMEA Out Port Set

| AT+CGNSPORT GNSS NMEA Out Port Set               |   |
|--|---|
| Test Command<br><b>AT+CGNSPORT=?</b>             | Response<br><b>+CGNSPORT: (list of supported &lt;port&gt;)</b><br><br><b>OK</b>                     |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CGNSPORT?</b>              | Response<br><b>+CGNSPORT: &lt;port&gt;</b><br><br><b>OK</b>   |
| Write Command<br><b>AT+CGNSPORT=&lt;port&gt;</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;port&gt;</b> num of the port NMEA out<br>3 NMEA port<br>4 NONE                 |
| Parameter Saving Mode                            | AUTO_SAVE_REBOOT  |
| Max Response Time                                | -   |
| Reference  | Note<br>Module must reboot to make it effect if <port> value is changed.                            |

#### 15.2.5 AT+CGNSCOLD GNSS Cold Start

| AT+CGNSCOLD GNSS Cold Start             |  |
|---|--|
| Test Command<br><b>AT+CGNSCOLD=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CGNSCOLD</b> | Response<br>If AT+CGNSXTRA=0<br><b>OK</b><br>Else if AT+CGNSXTRA=1<br><b>OK</b><br><br><b>+CGNSXTRA: &lt;mod&gt;</b> |

|                       |  |
|-----------------------|--|
|                       | Parameters<br><mod><br><br>0 Aid XTRA file success<br>1 XTRA file is not exist<br>2 XTRA file is not effective |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

### 15.2.6 AT+CGNSWARM GNSS Warm Start

| AT+CGNSWARM GNSS Warm Start             |                       |
|---|-----------------------|
| Test Command<br><b>AT+CGNSWARM=?</b>    | Response<br><b>OK</b> |
| Execution Command<br><b>AT+CGNSWARM</b> | Response<br><b>OK</b> |
| Parameter Saving Mode                   | NO_SAVE               |
| Max Response Time                       | -                     |
| Reference                               | Note                  |

### 15.2.7 AT+CGNSHOT GNSS Hot Start

| AT+CGNSHOT GNSS Hot Start              |                       |
|--|-----------------------|
| Test Command<br><b>AT+CGNSHOT=?</b>    | Response<br><b>OK</b> |
| Execution Command<br><b>AT+CGNSHOT</b> | Response<br><b>OK</b> |
| Parameter Saving Mode                  | NO_SAVE               |
| Max Response Time                      | -                     |
| Reference                              | Note                  |



## 15.2.8 AT+CGNSMOD GNSS Work Mode Set

| AT+CGNSMOD GNSS Work Mode Set   |   |
|---|---|
| Test Command<br><b>AT+CGNSMOD=?</b>   | <p>Response</p> <p><b>+CGNSMOD:</b> (list of supported <b>&lt;gps mode&gt;</b>),( list of supported <b>&lt;glo mode&gt;s</b>),( list of supported <b>&lt;bd mode&gt;s</b>),( list of supported <b>&lt;gal mode&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CGNSMOD?</b>  | <p>Response</p> <p><b>+CGNSMOD:</b> <b>&lt;gps mode&gt;</b>,<b>&lt;glo mode&gt;</b>,<b>&lt;bd mode&gt;</b>,<b>&lt;gal mode&gt;</b></p> <p><b>OK</b></p>   |
| Write Command<br><b>AT+CGNSMOD=&lt;gps mode&gt;,&lt;glo mode&gt;,&lt;bd mode&gt;,&lt;gal mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;GPS mode&gt;</b> GPS work mode</p> <p><u>1</u> Start GPS NMEA out</p> <p><b>&lt;glo mode&gt;</b> GLONASS work mode</p> <p>0 Stop GLONASS NMEA out</p> <p><u>1</u> Start GLONASS NMEA out</p> <p><b>&lt;bd mode&gt;</b> BEIDOU work mode</p> <p>0 Stop BEIDOU NMEA out</p> <p><u>1</u> Start BEIDOU NMEA out</p> <p>2 BEIDOU outside of us</p> <p><b>&lt;ga mode&gt;</b> GALILEAN work mode</p> <p><u>0</u> Stop GALILEAN NMEA out</p> <p>1 Start GALILEAN NMEA out</p> <p>2 GALILEAN out side of us</p> |
| Parameter Saving Mode   | AUTO_SAVE_REBOOT  |
| Max Response Time   | -   |
| Reference   | Note  |

## 15.2.9 AT+CGNSCFG GNSS NMEA Out Configure

| AT+CGNSCFG GNSS NMEA Out Configure              |  |
|---|--|
| Test Command<br><b>AT+CGNSCFG=?</b>             | <p>Response</p> <p><b>+CGNSCFG:</b> (list of supported &lt;mode&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CGNSCFG?</b>              | <p>Response</p> <p>TA returns the current status of configure</p> <p><b>+CGNSCFG: &lt;mode&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CGNSCFG=&lt;mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b>    <u>0</u>    Turn off GNSS NMEA data out put to USB's NMEA port when set AT+CGNSPWR=1/0 through UART</p> <p>                  <u>1</u>    Turn on GNSS NMEA data out put to USB's NMEA port when set AT+CGNSPWR=1/0 through UART</p> <p>                  <u>2</u>    Turn on GNSS NMEA data out put to UART3 port when set AT+CGNSPWR=1/0</p> |
| Parameter Saving Mode                           | NO_SAVE  |
| Max Response Time                               | -  |
| Reference                                       | <p>Note</p> <p>This command only supported in UART port.</p>   |

## 15.2.10 AT+CGNSTST GNSS NMEA Data Out Put To At Port

| AT+CGNSTST GNSS NMEA Data Out Put To At Port                  |   |
|---|---|
| Test Command<br><b>AT+CGNSTST=?</b>                           | Response<br><b>+CGNSTST: (0-1), (1-255)</b>   |
|   | <b>OK</b>   |
| Read Command<br><b>AT+CGNSTST?</b>                            | Parameters<br>See Write Command   |
|   | Response<br>TA returns the current status of configure<br><b>+CGNSTST: &lt;TST&gt;</b>  |
| Write Command<br><b>AT+CGNSTST=&lt;TST&gt;[,&lt;cont&gt;]</b> | <b>OK</b>   |
|   | or<br><b>ERROR</b>  |
| Parameter Saving Mode   | Parameters<br><b>&lt;TST&gt;</b> <u>0</u> Turn off GNSS NMEA data out put to AT port<br>1    Turn on GNSS NMEA data out put to AT port<br><b>&lt;cont&gt;</b> 1-255 the number of NMEA data package |
|   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   |   |

### 15.2.11 AT+CGNSXTRA GNSS XTRA Function Open

| AT+CGNSXTRA GNSS XTRA Function Open                |   |
|--|---|
| Test Command<br><b>AT+CGNSXTRA=?</b>               | Response<br><b>+CGNSXTRA: (0-1)</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CGNSXTRA?</b>                | Response<br>TA returns the current status of configure<br><b>+CGNSXTRA: &lt;enable&gt;</b><br><br><b>OK</b> |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGNSXTRA=&lt;enable&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;enable&gt;</b><br><br>0 Disable XTRA function<br>1 Enable XTRA function                |
| Parameter Saving Mode                              | NO_SAVE   |
| Max Response Time                                  | -   |
| Reference  |   |

### 15.2.12 AT+CGNSCPY GNSS XTRA File Copy

| AT+CGNSCPY GNSS XTRA File Copy         |   |
|--|---|
| Test Command<br><b>AT+CGNSCPY=?</b>    | Response<br><b>OK</b>                                     |
|  | Parameters<br>See Execution Command                       |
| Execution Command<br><b>AT+CGNSCPY</b> | Response<br><b>+CGNSCPY: &lt;ret&gt;</b><br><br><b>OK</b> |

|                       |   |
|-----------------------|---|
|                       | Parameters<br><ret><br>1 File not exist<br>0 Copy success |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             |   |

### 15.2.13 AT+CGNSRTMS GNSS NMEA Out Frequency Configure

| AT+CGNSRTMS GNSS NMEA Out Frequency Configure |   |
|---|---|
| Test Command<br><b>AT+CGNSRTMS=?</b>          | Response<br><b>+CGNSRTMS: (list of supported &lt;frequency&gt;s)</b><br><br><b>OK</b>         |
|   | Parameters<br>See Read Command  |
| Read Command<br><b>AT+CGNSRTMS?</b>           | Response<br><b>+CGNSRTMS: &lt;frequency&gt;</b><br><br><b>OK</b>                              |
|   | Parameters<br><frequency> GNSS NMEA Out Frequency, range is 50-1000.<br>Defaultvalue is 1000. |
| Parameter Saving Mode                         | NO_SAVE   |
| Max Response Time                             | -   |
| Reference                                     |   |

## 16 AT Commands for File System

### 16.1 Overview

| Command     | Description   |
|-------------|---|
| AT+CFSINIT  | Get Flash Data Buffer   |
| AT+CFSWFILE | Write File to the Flash Buffer Allocated by CFSINIT             |
| AT+CFSRFILE | Read File from Flash  |
| AT+CFSDFILE | Delete the File from the Flash                                  |
| AT+CFSGFIS  | Get File Size   |
| AT+CFSREN   | Rename a file   |
| AT+CFSGFRS  | Get the size of file system                                     |
| AT+CFSTERM  | Free the Flash Buffer Allocated by CFSINIT                      |
| AT+CBAINIT  | Initialize the ap backup file system                            |
| AT+CBALIST  | Set the files which want to backup                              |
| AT+CBAPPS   | Start to backup ap file system allocated by CBAINIT and CBALIST |
| AT+CBART    | Restore the file into ap file system                            |

### 16.2 Detailed Descriptions of Commands

#### 16.2.1 AT+CFSINIT Get Flash Data Buffer

| AT+CFSINIT Get Flash Data Buffer |   |
|----------------------------------|---|
| Execution Command<br>AT+CFSINIT  | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b> |
|                                  | Parameters  |
| Parameter Saving Mode            | -   |
| Max Response Time                | -   |
| Reference                        | Note  |

## 16.2.2 AT+CFSWFILE Write File to the Flash Buffer Allocated by CFSINIT

| AT+CFSWFILE Write File to the Flash Buffer Allocated by CFSINIT                                |  |
|--|--|
| Test Command<br>AT+CFSWFILE=<br>?  | Response<br>+CFSWFILE: (0-3),"fileName",(0-1),(1-10240),(100-10000)<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CFSWFILE=<br><index>,<file<br>name>,<mode>,<fi<br>le size>,<input<br>time> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;index&gt;</b><br>Directory of AP filesystem:<br>0 "/custapp/"<br>1 "/fota/"<br>2 "/datatx/"<br>3 "/customer/"<br><b>&lt;file name&gt;</b><br>File name length should less or equal 50 characters<br><b>&lt;mode&gt;</b><br>0 If the file already existed, write the data at the beginning of the file.<br>1 If the file already existed, add the data at the end of the file.<br><b>&lt;file size&gt;</b><br>File size should be less than 10240 bytes.<br><b>&lt;input time&gt;</b> Millisecond, should send file during this period or you can't send file when timeout. The value should be less than 10000 ms. |
| Parameter Saving Mode  | -  |
| Max Response Time  | -  |
| Reference  | Note   |

## 16.2.3 AT+CFSRFILE Read File from Flash

### AT+CFSRFILE Read File from Flash

|  |  |
|--|--|
| <b>Test Command</b><br><b>AT+CFSRFILE=?</b>  | <b>Response</b><br><b>+CFSRFILE: (0-3),"fileName",(0-1),(1-10240),(0-filesize)</b><br><br><b>OK</b><br><br><b>Parameters</b><br>See Write Command  |
| <b>Write Command</b><br><b>AT+CFSRFILE=&lt;index&gt;,&lt;file name&gt;,&lt;mode&gt;,&lt;file size&gt;,&lt;position&gt;</b> | <b>Response</b><br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br><br><b>Parameters</b><br><b>&lt;index&gt;</b><br>Directory of AP filesystem:<br>0   "/custapp/"<br>1   "/fota/"<br>2   "/datatx/"<br>3   "/customer/"<br><br><b>&lt;file name&gt;</b><br>File name length should be less than or equal to 50 characters,<br><b>&lt;mode&gt;</b><br>0   Read data at the beginning of the file .<br>1   Read data at the <position> of the file .<br><b>&lt;file size&gt;</b><br>The size of the file that you want to read should be less than 10240.<br><b>&lt;position&gt;</b> The starting position that will be read in the file.<br>When <write mode>=0, <position> is invalid. Read data from the beginning to the end of the file.<br>When <write mode>=1, <position> is valid. Read data from the <position> to the end of the file. |
| <b>Parameter Saving Mode</b>   | -  |
| <b>Max Response Time</b>   | -  |
| <b>Reference</b>   | Note   |

#### 16.2.4 AT+CFSDFILE Delete the File from the Flash

**AT+CFSDFILE   Delete the File from the Flash**



|  |   |
|--|---|
| Test Command<br><b>AT+CFSDFILE=?</b>   | Response<br><b>+CFSDFILE: (0-3),"fileName"</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CFSDFILE=<br/>&lt;index&gt;,&lt;file<br/>name&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;index&gt;</b><br>Directory of AP filesystem:<br>0 "/custapp/"<br>1 "/fota/"<br>2 "/datatx/"<br>3 "/customer/"<br><b>&lt;file name&gt;</b><br>File name length should be less than or equal to 50 characters. |
|  |   |
| Parameter Saving Mode  | -   |
| Max Response Time  | -   |
| Reference  | Note  |

### 16.2.5 AT+CFSGFIS Get File Size

| <b>AT+CFSGFIS Get File Size</b>   |  |
|---|--|
| Test Command<br><b>AT+CFSGFIS=?</b>                                     | Response<br><b>+CFSGFIS: (0-3),"fileName"</b>                          |
|   | <b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CFSGFIS=&lt;i<br/>ndex&gt;,&lt;file name&gt;</b> | Response<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br>or |
|   |  |
|   |  |

|                       |   |
|-----------------------|---|
|                       | <b>+CFSGFIS:&lt;n&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;file name&gt;</b><br>File name length should be less than or equal to 50 characters.<br><b>&lt;n&gt;</b> File size<br><b>&lt;index&gt;</b><br>Directory of AP filesystem:<br>0 "/custapp/"<br>1 "/fota/"<br>2 "/datatx/"<br>3 "/customer/" |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | Note  |

#### 16.2.6 AT+CFSREN Rename a File

| AT+CFSREN Rename a File   |   |
|---|---|
| Test Command<br><b>AT+CFSREN=?</b>  | Response<br><b>+CFSREN: (0-3),"old_name","new_name"</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CFSREN=&lt;index&gt;,&lt;old file name&gt;,&lt;new file name&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;index&gt;</b><br>Directory of AP filesystem:<br>0 "/custapp/"<br>1 "/fota/"<br>2 "/datatx/"<br>3 "/customer/" |

|                       |   |
|-----------------------|---|
|                       | <p><b>&lt;old file name&gt;</b><br/>File name length should be less than or equal to 50 characters.</p> <p><b>&lt;new file name&gt;</b><br/>File name length should be less than or equal to 50 characters.</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | Note  |

### 16.2.7 AT+CFSGFRS Get the Size of File System

| AT+CFSGFRS Get the Size of file system |   |
|--|---|
| Read Command<br><b>AT+CFSGFRS?</b>     | <p>Response</p> <p><b>ERROR</b></p> <p>or</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>or</p> <p><b>+CFSGFRS:&lt;n&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> the size of file system</p> |
| Parameter Saving Mode                  | -   |
| Max Response Time                      | -   |
| Reference                              | Note  |

### 16.2.8 AT+CFSTERM Free the Flash Buffer Allocated by CFSINIT

| AT+CFSTERM Free the Flash Buffer Allocated by CFSINIT |  |
|---|--|
| Execution Command<br><b>AT+CFSTERM</b>                | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>or</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> |

|                       |      |
|-----------------------|------|
| Parameter Saving Mode | -    |
| Max Response Time     | -    |
| Reference             | Note |

### 16.2.9 AT+CBAINIT Initialize the AP Backup File System

| AT+CBAINIT Initialize the AP Backup File System |  |
|---|--|
| Execution Command<br><b>AT+CBAINIT</b>          | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>or</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> |
| Parameter Saving Mode                           | -  |
| Max Response Time                               | 3 seconds  |
| Reference                                       | Note   |

### 16.2.10 AT+CBALIST Set the files Which Want to Backup

| AT+CBALIST Set the Files Which Want to Backup                     |   |
|---|---|
| Read Command<br><b>AT+CBALIST?</b>                                | <p>Response</p> <p><b>+CBALIST: &lt;index&gt;,&lt;filename&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CBALIST=&lt;index&gt;,&lt;filename&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;index&gt;</b>     0-9    The file index.</p> <p>                 10    Disable log</p> <p>                 11    Enable log</p> <p><b>&lt;file name&gt;</b> File name length should less than or equal to 80 characters.</p> |

|                       |         |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     |         |
| Reference             | Note    |

### 16.2.11 AT+CBAPPS Start to Backup AP File System Allocated by CBAINIT and CBALIST

| AT+CBAPPS Start to Backup AP File System Allocated by CBAINIT and CBALIST |   |
|---|---|
| Execution Command<br>AT+CBAPPS  | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br>Parameters |
| Parameter Saving Mode   | -   |
| Max Response Time   | 3 seconds   |
| Reference   | Note  |

### 16.2.12 AT+CBART Restore the File into AP File System

| AT+CBART Restore the File into AP File System |   |
|---|---|
| Execution Command<br>AT+CBART                 | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>or<br><b>+CME ERROR: &lt;err&gt;</b><br>Parameters |
| Parameter Saving Mode                         | -   |
| Max Response Time                             | 3 seconds   |
| Reference                                     | Note<br>The files should have been backup into ap file system                                     |

## 17 AT Commands for SIM Application Toolkit

### 17.1 Overview

| Command | Description         |
|---------|---------------------|
| AT+STIN | SAT indication      |
| AT+STGI | Get SAT information |
| AT+STGR | SAT respond         |
| AT+STK  | STK switch          |

### 17.2 Detailed Descriptions of Commands

#### 17.2.1 AT+STIN SAT Indication

| AT+STIN SAT Indication    |   |
|---------------------------|---|
| Test Command<br>AT+STIN=? | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Read Command</p>  |
| Read Command<br>AT+STIN?  | <p>Response</p> <p><b>+STIN: &lt;cmd_id&gt;</b></p> <p><b>OK</b></p> <p>If the current proactive command has been changed:</p> <p><b>+ STIN: &lt;cmd_id&gt;</b></p> <p>Parameters</p> <p><b>&lt;cmd_id&gt;</b> Indicate the type of proactive command issued.</p> <ul style="list-style-type: none"> <li>21 Display text</li> <li>22 Get inkey</li> <li>23 Get input</li> <li>24 Select item</li> <li>25 Set up menu</li> </ul> |
| Parameter Saving Mode     | -   |
| Max Response Time         | -   |
| Reference                 | Notification that application will return to main menu automatically if user doesn't do any action in 2 minutes.  |

## 17.2.2 AT+STGI Get SAT Information

| AT+STGI Get SAT Information       |  |
|-----------------------------------|--|
| Test Command<br>AT+STGI=?         | Response<br><b>OK</b>  |
|                                   | Parameters<br>See Write Command  |
| Write Command<br>AT+STGI=<cmd_id> | Response<br>If <cmd_id>=21:<br>+STGI:21,<prio>,<clear_mode>,<text_len>,<text><br><br><b>OK</b><br><br>If <cmd_id>=22:<br>+STGI:22,<rsp_format>,<help>,<text_len>,<text><br><br><b>OK</b><br><br>If <cmd_id>=23:<br>+STGI:23,<rsp_format>,<max_len>,<min_len>,<help>,<show><text_len>,<text><br><br><b>OK</b><br><br>If <cmd_id>=24:<br>+STGI:24,<help>,<softkey>,<present>,<title_len>,<title><item_num><br>+STGI:24,<item_id>,<item_len>,<item_data><br>[...]<br><br><b>OK</b><br><br>If <cmd_id>=25:<br>+STGI:25,<help>,<softkey>,<title_len>,<title><item_num><br>+STGI:25,<item_id>,<item_len>,<item_data><br>[...]<br><br><b>OK</b><br>or<br><b>ERROR</b> |
|                                   | Parameters<br><cmd_id> See AT+STIN.<br><prio> Priority of display text.<br>0 Normal priority   |

|                       |   |
|-----------------------|---|
|                       | <p>1 High priority</p> <p><b>&lt;clear_mode&gt;</b></p> <p>0 Clear after a delay</p> <p>1 Clear by user</p> <p><b>&lt;text_len&gt;</b> Length of text</p> <p><b>&lt;rsp_format&gt;</b></p> <p>0 SMS default alphabet</p> <p>1 YES or NO</p> <p>2 Numerical only</p> <p>3 UCS2</p> <p><b>&lt;help&gt;</b></p> <p>0 Help unavailable</p> <p>1 Help available</p> <p><b>&lt;max_len&gt;</b> Maximum length of input</p> <p><b>&lt;min_len&gt;</b> Minimum length of input</p> <p><b>&lt;show&gt;</b></p> <p>0 Hide input text</p> <p>1 Display input text</p> <p><b>&lt;softkey&gt;</b></p> <p>0 No softkey preferred</p> <p>1 Softkey preferred</p> <p><b>&lt;present&gt;</b> Menu presentation format available for select item</p> <p>0 Presentation not specified</p> <p>1 Data value presentation</p> <p>2 Navigation presentation</p> <p><b>&lt;title_len&gt;</b> Length of title</p> <p><b>&lt;item_num&gt;</b> Number of items in the menu</p> <p><b>&lt;item_id&gt;</b> Identifier of item</p> <p><b>&lt;item_len&gt;</b> Length of item</p> <p><b>&lt;title&gt;</b> Title in ucs2 format</p> <p><b>&lt;item_data&gt;</b> Content of the item in ucs2 format</p> <p><b>&lt;text&gt;</b> Text in ucs2 format</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | <p>Regularly this command is used upon receipt of an URC "+STIN" to request the parameters of the proactive command. Then the TA is expected to acknowledge the AT+STGI response with AT+STGR to confirm that the proactive command has been executed.</p>  |



### 17.2.3 AT+STGR SAT Respond

| AT+STGR SAT respond   |  |
|---|--|
| Test Command<br><b>AT+STGR=?</b>                              | Response<br><b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+STGR=&lt;cmd_id&gt;[,&lt;data&gt;]</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
|   | Parameters<br><p><b>&lt;cmd_id&gt;</b> Identifier of proactive command.</p> <ul style="list-style-type: none"> <li>22 Get inkey</li> <li>23 Get input</li> <li>24 Select item</li> <li>25 Set up menu</li> <li>83 Session end by user</li> <li>84 Go backward</li> </ul> <p><b>&lt;data&gt;</b></p> <p>If <b>&lt;cmd_id&gt;=22:</b><br/>Input a character</p> <p>If <b>&lt;cmd_id&gt;=23:</b><br/>Input a string.<br/>If <b>&lt;rsp_format&gt;</b> is YES or NO, input of a character in case of ANSI character set requests one byte, e.g. "Y".<br/>If <b>&lt;rsp_format&gt;</b> is numerical only, input the characters in decimal number, e.g. "123".<br/>If <b>&lt;rsp_format&gt;</b> is UCS2, requests a 4 byte string, e.g. "0031".<br/><b>&lt;rsp_format&gt;</b> refer to the response by AT+STGI=23.</p> <p>If <b>&lt;cmd_id&gt;=24:</b><br/>Input the identifier of the item selected by user.</p> <p>If <b>&lt;cmd_id&gt;=25:</b><br/>Input the identifier of the item selected by user.</p> <p>If <b>&lt;cmd_id&gt;=83:</b><br/><b>&lt;data&gt;</b>Ignore<br/>Note: It could return main menu during proactive command id is not 22 or 23.</p> <p>If <b>&lt;cmd_id&gt;=84:</b><br/><b>&lt;data&gt;</b> Ignore</p> |
| Parameter Saving Mode   | -  |

|                   |      |
|-------------------|------|
| Max Response Time | -    |
| Reference         | Note |

#### 17.2.4 AT+STK STK Switch

| AT+STK STK Switch                            |  |
|--|--|
| Test Command<br><b>AT+STK=?</b>              | Response<br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+STK?</b>               | Response<br><b>+STK: &lt;value&gt;</b>                                     |
|  | <b>OK</b>  |
| Write Command<br><b>AT+STK=&lt;value&gt;</b> | Parameters<br>See Write Command  |
|  | Response<br><b>OK</b><br>or<br><b>ERROR</b>                                |
| Parameter Saving Mode                        | Parameters<br><b>&lt;value&gt;</b><br><u>0</u> Disable STK<br>1 Enable STK |
|  | -  |
| Max Response Time                            | -  |
| Reference                                    | Note   |

## 18 AT Commands for TCP/UDP Application Supported SSL

### 18.1 Overview

| Command     | Description                                      |
|-------------|--|
| AT+CACID    | Set TCP/UDP identifier                           |
| AT+CASSLCFG | Set SSL certificate and timeout parameters       |
| AT+CAOPEN   | Open a TCP/UDP connection                        |
| AT+CASEND   | Send data via an established connection          |
| AT+CARECV   | Receive data via an established connection       |
| AT+CACLOSE  | Close a TCP/UDP connection                       |
| AT+CSSLCFG  | Configure SSL parameters of a context identifier |
| AT+CACFG    | Configure transparent transmission parameters    |
| AT+CASWITCH | Switch to transparent transport mode             |

### 18.2 Detailed Descriptions of Commands

#### 18.2.1 AT+CACID Set TCP/UDP Identifier

| AT+CACID Set TCP/UDP Identifier      |   |
|--------------------------------------|---|
| Test Command<br>AT+CACID=?           | Response<br>+CACID: (range of supported <cid>s)<br><br>OK                       |
|                                      | Parameters<br>See Write Command   |
| Read Command<br>AT+CACID?            | Response<br>[+CACID: <cid>]<br><br>OK   |
|                                      | Parameters<br>See Write Command   |
| Write Command<br>AT+CACID=<cid><br>> | Response<br>OK<br>If error is related to ME functionality:<br>+CME ERROR: <err> |
|                                      | Parameters<br><cid> TCP/UDP identifier  |

|                       |         |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     | -       |
| Reference             | Note    |

## 18.2.2 AT+CASSLCFG Set SSL Certificate and Timeout Parameters

| AT+CASSLCFG Set SSL Certificate and Timeout Parameters |   |
|--|---|
| Test Command<br><b>AT+CASSLCFG=?</b>                   | <p>Response</p> <p>+CASSLCFG: (range of supported &lt;cid&gt;s),"cacert",&lt;cname&gt;<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"clientcert",&lt;certname&gt;<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"psktable",&lt;pskname&gt;<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"timeout",(0-65535)<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"ssl",(0,1)<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"crindex",(0,5)<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"localport",(0-65536)<br/>           +CASSLCFG: (range of supported &lt;cid&gt;s),"protocol",(0,1)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Read Command<br><b>AT+CASSLCFG?</b>                    | <p>Response</p> <p>If &lt;cid&gt; has been set by AT+CACID:<br/>           +CASSLCFG: &lt;cid&gt;<br/>           cacert:&lt;cname&gt;<br/>           clientcert:&lt;certname&gt;<br/>           psktable:&lt;pskname&gt;<br/>           timeout:&lt;timeout&gt;<br/>           ssl:&lt;ssl&gt;<br/>           crindex:&lt;crindex&gt;<br/>           localport:&lt;localport&gt;<br/>           protocol:&lt;protocol&gt;</p> <p><b>OK</b></p> <p>If no &lt;cid&gt; has been set by AT+CACID:<br/> <b>OK</b></p> <p>Parameter<br/>See Write Command</p>   |

|   |   |
|---|---|
| <p>Write Command<br/><b>AT+CASSLCFG=</b><br/><b>&lt;cid&gt;,"cacert",&lt;c</b><br/><b>aname&gt;</b></p> | <p>Response<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> TCP/UDP identifier, see AT+CACID<br/><b>&lt;caname&gt;</b> Alphanumeric ASCII text string up to 64 characters. Root certificate name that has been configured by AT+CSSLCFG.<br/><b>Note:</b> If the root certificate is empty, module will trust all certificates as default.</p> |
| <p><b>AT+CASSLCFG=</b><br/><b>&lt;cid&gt;,"clientcert",</b><br/><b>&lt;certname&gt;</b></p>             | <p>Response<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;certname&gt;</b> Alphanumeric ASCII text string up to 64 characters. Client certificate name that has been configured by AT+CSSLCFG.</p>   |
| <p><b>AT+CASSLCFG=</b><br/><b>&lt;cid&gt;,"psktable",</b><br/><b>&lt;pskname&gt;</b></p>                | <p>Response<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;pskname&gt;</b> Alphanumeric ASCII text string up to 64 characters. PSK table name that has been configured by AT+CSSLCFG.</p>   |
| <p><b>AT+CASSLCFG=</b><br/><b>&lt;cid&gt;,"ssl",&lt;sslFla</b><br/><b>g&gt;</b></p>                     | <p>Response<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;sslFlag&gt;</b> Interger<br/>0 Not support SSL<br/>1 Support SSL</p>   |
| <p><b>AT+CASSLCFG=</b><br/><b>&lt;cid&gt;,"crindex",&lt;</b><br/><b>crindex&gt;</b></p>                 | <p>Response<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;ctxindex&gt;</b> The identifier of SSL configurations, see AT+CSSLCFG.</p>   |

|   |   |
|---|---|
| <b>AT+CASSLCFG=</b><br><b>&lt;cid&gt;,"protocol",</b><br><b>&lt;crindex&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;cid&gt;</b>     see AT+CACID</p> <p><b>&lt;protocol&gt;</b> Interger</p> <p>      0    TCP</p> <p>      1    UDP</p> |
| Parameter    Saving<br>Mode   | NO_SAVE   |
| Max        Response<br>Time   | -   |
| Reference   | Note  |

### 18.2.3 AT+CAOPEN   Open a TCP/UDP Connection

| <b>AT+CAOPEN   Open a TCP/UDP Connection</b>   |   |
|--|---|
| Test Command<br><b>AT+CAOPEN=?</b>   | <p>Response</p> <p><b>+CAOPEN: (range of supported &lt;cid&gt;s),&lt;server&gt;,(1-65535)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CAOPEN?</b>  | <p>Response</p> <p>If &lt;cid&gt; has been set by AT+CACID:</p> <p><b>+CAOPEN: &lt;cid&gt;,&lt;server&gt;,&lt;port&gt;</b></p> <p><b>OK</b></p> <p>If no &lt;cid&gt; has been set by AT+CACID:</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p> |
| Write Command<br><b>AT+CAOPEN=&lt;cid&gt;,&lt;server&gt;,&lt;port&gt;</b><br><b>&gt;</b> | <p>Response</p> <p><b>+CAOPEN: &lt;cid&gt;,&lt;result&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p>  |

|                       |   |
|-----------------------|---|
|                       | Parameters  |
|                       | <p><b>&lt;cid&gt;</b> see AT+CACID</p> <p><b>&lt;server&gt;</b> Alphanumeric ASCII text string up to 64 characters. Server IP address or host name.</p> <p><b>&lt;port&gt;</b> Integer. Server port.</p> <p><b>&lt;result&gt;</b></p> <ul style="list-style-type: none"> <li>0 Success</li> <li>1 Status error</li> <li>2 Configure type error</li> <li>3 Parameter invalid</li> <li>4 TCP connect error</li> <li>5 UDP create error</li> <li>6 Configuration load error</li> <li>7 Socket add error</li> <li>8 Certificate's time expired</li> <li>9 Certificate's common name does not match</li> <li>10 Certificate's common name does not match and time expired</li> <li>11 Connect failed error</li> <li>12 Socket handle error</li> <li>13 Data length error</li> <li>14 Memory error</li> <li>15 Data send error</li> <li>16 SSL general error</li> <li>17 Unknown error</li> </ul> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <p>After open a connection successfully, if module receives data, it will report "+CADATAIND: &lt;cid&gt;" to remind user to read data.</p>   |

#### 18.2.4 AT+CASEND Send Data via an Established Connection

| AT+CASEND Send Data via an Established Connection |  |
|---|--|
| Test Command                                      | Response   |
| AT+CASEND=?                                       | <p>+CASEND: (range of supported &lt;cid&gt;s),( range of supported &lt;datalen&gt;),( range of supported &lt;inputtime&gt;)</p> <p><b>OK</b></p> |
|   | Parameters   |
|   | See Write Command  |

|   |  |
|---|--|
| Write Command<br><b>AT+CASEND=&lt;cid&gt;,&lt;datalen&gt;[,inputtime]</b> | <p>Response</p> <p><b>+CASEND: &lt;cid&gt;,&lt;datalen&gt;</b><br/>..... //Input data<br/><b>OK</b><br/><b>+CASEND: &lt;cid&gt;,&lt;result&gt;,&lt;sendlen&gt;</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;datalen&gt;</b> Requested number of data bytes to be transmitted<br/><b>&lt;inputtime&gt;</b> Millisecond, should input data during this period or you can't input data when timeout.<br/><b>&lt;sendlen&gt;</b> Data bytes that has been sent successfully<br/><b>&lt;result&gt;</b> see AT+CAOPEN</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | <p>Note</p> <p>Set the input time that input data during this period or you can't input data when timeout. The default inputtime is 5000ms.</p>  |

### 18.2.5 AT+CARECV Receive Data via an Established Connection

| AT+CARECV Receive Data via an Established Connection          |  |
|---|--|
| Test Command<br><b>AT+CARECV=?</b>                            | <p>Response</p> <p><b>+CARECV: (range of supported &lt;cid&gt;s),( range of supported &lt;readlen&gt;)</b><br/><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CARECV=&lt;cid&gt;,&lt;readlen&gt;</b> | <p>Response</p> <p><b>+CARECV: &lt;cid&gt;,&lt;rcvlen&gt;</b><br/>..... //output data<br/><b>OK</b><br/>If error is related to ME functionality:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;readlen&gt;</b> Requested number of data bytes to be read<br/><b>&lt;rcvlen&gt;</b> Data bytes that has been actually received</p> |



|                       |         |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     | -       |
| Reference             | Note    |

### 18.2.6 AT+CACLOSE Close a TCP/UDP Connection

| AT+CACLOSE Close a TCP/UDP Connection |   |
|---------------------------------------|---|
| Test Command<br>AT+CACLOSE=?          | <p>Response</p> <p>+CACLOSE: (range of supported &lt;cid&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>                                 |
| Write Command<br>AT+CACLOSE=<cid>     | <p>Response</p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/>+CME ERROR: &lt;err&gt;</p> <p>Parameters<br/>&lt;cid&gt; see AT+CACID</p> |
| Parameter Saving Mode                 | NO_SAVE   |
| Max Response Time                     | -   |
| Reference                             | Note  |

### 18.2.7 AT+CSSLCFG Configure SSL Parameters of a Context Identifier

| AT+CSSLCFG Configure SSL Parameters of a Context Identifier |   |
|---|---|
| Test Command<br>AT+CSSLCFG=?                                | <p>Response</p> <p>+CSSLCFG: "sslversion",(0-5),(0-5)</p> <p>+CSSLCFG:</p> <p>"ciphersuite",(0-5),(0-7),(0x008A,0x008B,0x008C,0x008D,0x00A8,0x00A9,0x00AE,0x00AF,0x002F,0x0033,0x0035,0x0039,0xC02A,0xC02B,0xC02C,0xC02D,0xC02E,0xC02F,0xC030,0xC031,0xC032,0xC09C,0xC09D,0xC09E,0xC09F,0xC0A0,0xC09F,0xC0A1,0xC0A2,0xC0A3,0xCC13,0xCC14,0xCC15)</p> <p>+CSSLCFG: "ignorertctime",(0-5),(0-1)</p> <p>+CSSLCFG: "protocol",(0-5),(1-2)</p> |

|  |   |
|--|---|
|  | <b>+CSSLCFG: "ctxindex",(0-5)</b><br><b>+CSSLCFG: "convert",(1-3),(&lt;cname&gt;,[&lt;keyname&gt;],[&lt;passkey&gt;])</b><br><b>+CSSLCFG: "sni",(0-5),&lt;servername&gt;</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CSSLCFG?</b>   | Response<br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSSLCFG="sslversion",&lt;ctxindex&gt;,&lt;sslversion&gt;</b>                        | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;ctxindex&gt; (0-5)</b><br><b>&lt;sslversion&gt;</b><br>0 QAPI_NET_SSL_PROTOCOL_UNKNOWN<br>1 QAPI_NET_SSL_PROTOCOL_TLS_1_0<br>2 QAPI_NET_SSL_PROTOCOL_TLS_1_1<br>3 QAPI_NET_SSL_PROTOCOL_TLS_1_2<br>4 QAPI_NET_SSL_PROTOCOL_DTLS_1_0<br>5 QAPI_NET_SSL_PROTOCOL_DTLS_1_2  |
| Write Command<br><b>AT+CSSLCFG="ciphersuite",&lt;ctxindex&gt;,&lt;cipher_index&gt;,&lt;ciphersuite&gt;</b> | Response<br><b>OK</b><br>If failed:<br><b>+CME ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;ctxindex&gt; (0-5)</b><br><b>&lt;cipher_index&gt; (0-7)</b><br><b>&lt;ciphersuite&gt;</b><br>0x008A QAPI_NET_TLS_PSK_WITH_RC4_128_SHA<br>0x008B QAPI_NET_TLS_PSK_WITH_3DES_EDE_CBC_SHA<br>0x008C QAPI_NET_TLS_PSK_WITH_AES_128_CBC_SHA<br>0x008D QAPI_NET_TLS_PSK_WITH_AES_256_CBC_SHA<br>0x00A8 QAPI_NET_TLS_PSK_WITH_AES_128_GCM_SHA256<br>0x00A9 QAPI_NET_TLS_PSK_WITH_AES_256_GCM_SHA384<br>0x00AE QAPI_NET_TLS_PSK_WITH_AES_128_CBC_SHA256<br>0x00AF QAPI_NET_TLS_PSK_WITH_AES_256_CBC_SHA384<br>0x002F QAPI_NET_TLS_RSA_WITH_AES_128_CBC_SHA<br>0x0033 QAPI_NET_TLS_DHE_RSA_WITH_AES_128_CBC_SHA<br>0x0035 QAPI_NET_TLS_RSA_WITH_AES_256_CBC_SHA |

0x0039 QAPI\_NET\_TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0x003C QAPI\_NET\_TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0x003D QAPI\_NET\_TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256  
0x0067  
QAPI\_NET\_TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0x006B  
QAPI\_NET\_TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA256  
0x009C QAPI\_NET\_TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0x009D QAPI\_NET\_TLS\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0x009E  
QAPI\_NET\_TLS\_DHE\_RSA\_WITH\_AES\_128\_GCM\_SHA256  
0x009F  
QAPI\_NET\_TLS\_DHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384  
0xC004  
QAPI\_NET\_TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_CBC\_SHA  
0xC005  
QAPI\_NET\_TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_CBC\_SHA  
0xC009  
QAPI\_NET\_TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_CBC\_SHA  
0xC00A  
QAPI\_NET\_TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_CBC\_SHA  
0xC00E QAPI\_NET\_TLS\_ECDH\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0xC00F QAPI\_NET\_TLS\_ECDH\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0xC013  
QAPI\_NET\_TLS\_ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA  
0xC014  
QAPI\_NET\_TLS\_ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA  
0xC023  
QAPI\_NET\_TLS\_ECDHE\_ECDSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC024  
QAPI\_NET\_TLS\_ECDHE\_ECDSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC025  
QAPI\_NET\_TLS\_ECDH\_ECDSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC026  
QAPI\_NET\_TLS\_ECDH\_ECDSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC027  
QAPI\_NET\_TLS\_ECDHE\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC028  
QAPI\_NET\_TLS\_ECDHE\_RSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC029  
QAPI\_NET\_TLS\_ECDH\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
0xC02A  
QAPI\_NET\_TLS\_ECDH\_RSA\_WITH\_AES\_256\_CBC\_SHA384  
0xC02B

|   |  |
|---|--|
|   | <p>QAPI_NET_TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256<br/>0xC02C</p> <p>QAPI_NET_TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384<br/>0xC02D</p> <p>QAPI_NET_TLS_ECDH_ECDSA_WITH_AES_128_GCM_SHA256<br/>0xC02E</p> <p>QAPI_NET_TLS_ECDH_ECDSA_WITH_AES_256_GCM_SHA384<br/>0xC02F</p> <p>QAPI_NET_TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256<br/>0xC030</p> <p>QAPI_NET_TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384<br/>0xC031</p> <p>QAPI_NET_TLS_ECDH_RSA_WITH_AES_128_GCM_SHA256<br/>0xC032</p> <p>QAPI_NET_TLS_ECDH_RSA_WITH_AES_256_GCM_SHA384<br/>0xC09C</p> <p>QAPI_NET_TLS_RSA_WITH_AES_128_CCM<br/>0xC09D</p> <p>QAPI_NET_TLS_RSA_WITH_AES_256_CCM<br/>0xC09E</p> <p>QAPI_NET_TLS_DHE_RSA_WITH_AES_128_CCM<br/>0xC09F</p> <p>QAPI_NET_TLS_DHE_RSA_WITH_AES_256_CCM<br/>0xC0A0</p> <p>QAPI_NET_TLS_RSA_WITH_AES_128_CCM_8<br/>0xC0A1</p> <p>QAPI_NET_TLS_RSA_WITH_AES_256_CCM_8<br/>0xC0A2</p> <p>QAPI_NET_TLS_DHE_RSA_WITH_AES_128_CCM_8<br/>0xC0A3</p> <p>QAPI_NET_TLS_DHE_RSA_WITH_AES_256_CCM_8<br/>0xCC13</p> <p>QAPI_NET_TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256<br/>0xCC14</p> <p>QAPI_NET_TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256<br/>0xCC15</p> <p>QAPI_NET_TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256<br/>56</p> |
| AT+CSSLCFG="ignoretime",<ctxindex>,<ignoretime> | <p>Response</p> <p><b>OK</b></p> <p>If failed:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;ctxindex&gt; (0-5)</b></p> <p><b>&lt;ignoretime&gt;</b></p> <p><u>0</u> Do not ignore the RTC time</p> <p>1 Ignore the RTC time</p>   |
| AT+CSSLCFG="protocol",<ctxindex>                | <p>Response</p> <p><b>OK</b></p>   |

|   |   |   |                            |   |                        |   |                          |
|---|---|---|----------------------------|---|------------------------|---|--------------------------|
| <b>x&gt;,&lt;protocol&gt;</b>   | <p>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;ctxindex&gt; (0-5)</b><br/><b>&lt;protocol&gt;</b></p> <table border="0"> <tr> <td>1</td> <td>QAPI_NET_SSL_TLS_E</td> </tr> <tr> <td>2</td> <td>QAPI_NET_SSL_DTLS_E</td> </tr> </table>   | 1 | QAPI_NET_SSL_TLS_E         | 2 | QAPI_NET_SSL_DTLS_E    |   |                          |
| 1   | QAPI_NET_SSL_TLS_E  |   |                            |   |                        |   |                          |
| 2   | QAPI_NET_SSL_DTLS_E   |   |                            |   |                        |   |                          |
| <b>AT+CSSLCFG="ctxindex",&lt;ctxindex&gt;</b>   | <p>Response<br/><b>+CSSLCFG:</b><br/><b>&lt;ctxindex&gt;,&lt;sslversion&gt;,&lt;ciphersuite&gt;,&lt;ignoreretctime&gt;,&lt;protocol&gt;,&lt;servername&gt;</b></p> <p><b>OK</b></p> <p>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See other commands</p>   |   |                            |   |                        |   |                          |
| <b>AT+CSSLCFG="convert",&lt;ssltype&gt;,&lt;cname&gt;[,&lt;keyname&gt;[,&lt;passkey&gt;]]</b> | <p>Response<br/><b>OK</b></p> <p>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;ssltype&gt;</b></p> <table border="0"> <tr> <td>1</td> <td>QAPI_NET_SSL_CERTIFICATE_E</td> </tr> <tr> <td>2</td> <td>QAPI_NET_SSL_CA_LIST_E</td> </tr> <tr> <td>3</td> <td>QAPI_NET_SSL_PSK_TABLE_E</td> </tr> </table> <p><b>&lt;cname&gt;</b> String type (string should be included in quotation marks): name of cert file</p> <p><b>&lt;keyname&gt;</b> String type (string should be included in quotation marks):name of key file</p> <p><b>&lt;passkey&gt;</b> String type (string should be included in quotation marks):value of passkey</p> | 1 | QAPI_NET_SSL_CERTIFICATE_E | 2 | QAPI_NET_SSL_CA_LIST_E | 3 | QAPI_NET_SSL_PSK_TABLE_E |
| 1   | QAPI_NET_SSL_CERTIFICATE_E  |   |                            |   |                        |   |                          |
| 2   | QAPI_NET_SSL_CA_LIST_E  |   |                            |   |                        |   |                          |
| 3   | QAPI_NET_SSL_PSK_TABLE_E  |   |                            |   |                        |   |                          |
| <b>AT+CSSLCFG="servername",&lt;ctxindex&gt;,&lt;servername&gt;</b>                            | <p>Response<br/><b>OK</b></p> <p>If failed:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/><b>&lt;ctxindex&gt; (0-5)</b><br/><b>&lt;servername&gt;</b> String type.Server Name Indication.SNI addresses this issue by having the client send the name of the virtual domain as part of the TLS negotiation.</p>   |   |                            |   |                        |   |                          |
| Parameter Saving Mode   | NO_SAVE   |   |                            |   |                        |   |                          |

|                   |      |
|-------------------|------|
| Max Response Time | -    |
| Reference         | Note |

### 18.2.8 AT+CACFG Configure Transparent Transmission Parameters

| AT+CACFG Configure Transparent Transmission Parameters |   |  |
|--|---|--|
| Test Command<br>AT+CACFG=?                             | Response<br>+CACFG: "transwaittm",(0-20)<br>+CACFG: "transpktsize",(1-1460)<br><br>OK   |  |
| Read Command<br>AT+CACFG?                              | Response<br>+CACFG:<br>TRANSWAITTM:2<br>TRANSPKTSIZE:1024<br><br>OK   |  |
| Write Command<br>AT+CACFG=<ParamTag>,<ParamValue>      | Response<br>OK<br>or<br>ERROR<br><br><div> <div>&lt;ParaTag&gt;</div> <div>transwaittm</div> <div>transpktsize</div> </div> <div> <div>&lt;ParamValue&gt;</div> <div>Waiting to send time(100ms). default is 2</div> <div>Waiting for the size of the sending packet(byte).default is 1024</div> </div> |  |
| Parameter Saving Mode                                  | NO_SAVE   |  |
| Max Response Time                                      | -   |  |
| Reference  | Note  |  |

### 18.2.9 AT+CASWITCH Switch to Transparent Transport Mode

| AT+CASWITCH Switch to Transparent Transport Mode |  |
|--|--|
| Test Command<br>AT+CASWITCH=?                    | Response<br>+CASWITCH: (0-1),(0,1)<br><br>OK |

|  |  |
|--|--|
| Read Command<br><b>AT+CASWITCH?</b>  | Response<br><b>+CASWITCH: 0,0</b><br><br><b>OK</b>   |
| Write Command<br><b>AT+CASWITCH=</b><br><b>&lt;cid&gt;,&lt;transmode&gt;</b> | <p>Response<br/><b>OK</b><br/>or<br/><b>OK</b><br/><br/><b>CONNECT</b><br/>... ..<br/><br/><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters<br/><b>&lt;cid&gt;</b> see AT+CACID<br/><b>&lt;transmode&gt;</b><br/>    <u>0</u> Non transparent transmission mode<br/>    1 Transparent transmission mode</p> |
| Parameter    Saving<br>Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

## 19 AT Commands for PING

### 19.1 Overview

| Command    | Description        |
|------------|--------------------|
| AT+SNPING4 | Sends an IPv4 ping |
| AT+SNPING6 | Sends an IPv6 ping |

### 19.2 Detailed Descriptions of Commands

#### 19.2.1 AT+SNPING4 Sends an IPv4 ping

| AT+SNPING4 Sends an IPv4 ping                              |   |
|--|---|
| Test command<br>AT+SNPING4=?                               | Response<br>+SNPING4: "URL",(1-500),(1-1400),(0-60000)<br><br>OK  |
| Write command<br>AT+SNPING4=<URL>,<count>,<size>,<timeout> | Response<br>+SNPING4: <replyId>,<IP address>,<replyTime><br><br>OK<br>or<br>ERROR<br><br>Parameters<br><URL> String type :Address of the remote host<br><count> The number of Ping Echo Request to send, range: 1~500<br><size> Number of data bytes to send, range: 1~1400<br><timeout> Ping request timeout value (in ms),range:0-60000<br><replyId> Echo Reply number<br><IP Address> IP Address of the remote host<br><replyTime> Time, in ms, required to receive the response |
| Parameter Saving Mode                                      | -   |
| Max Response Time  | -   |
| Reference  | Note:<br>Before sending PING Request the GPRS context must be activated   |



## 19.2.2 AT+SNPING6 Sends an IPv6 ping

| AT+SNPING6 Sends an IPv6 ping   |   |
|---|---|
| Test command<br><b>AT+SNPING6=?</b>   | Response<br><b>+SNPING6: "URL",(1-500),(1-1400),(0-60000)</b><br><br><b>OK</b>  |
| Write command<br><b>AT+SNPING6=&lt;URL&gt;,&lt;count&gt;,&lt;size&gt;,&lt;timeout&gt;</b> | Response<br><b>+SNPING6: &lt;replyId&gt;,&lt;IP address&gt;,&lt;replyTime&gt;</b><br><br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><b>&lt;URL&gt;</b> String type :Address of the remote host<br><b>&lt;count&gt;</b> The number of Ping Echo Request to send, range: 1~500<br><b>&lt;size&gt;</b> Number of data bytes to send, range: 1~1400<br><b>&lt;timeout&gt;</b> Ping request timeout value (in ms),range:0-60000<br><b>&lt;replyId&gt;</b> Echo Reply number<br><b>&lt;IP Address&gt;</b> IP Address of the remote host<br><b>&lt;replyTime&gt;</b> Time, in ms, required to receive the response |
| Parameter Saving Mode   | -   |
| Max Response Time   | -   |
| Reference   | Note:<br>Before sending PING Request the GPRS context must be activated.  |

## 20 Supported Unsolicited Result Codes

### 20.1 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:

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

|     |   |
|-----|---|
| 32  | network not allowed - emergency call only     |
| 40  | network personalisation PIN required          |
| 41  | network personalisation PUK required          |
| 42  | network subset personalisation PIN required   |
| 43  | network subset personalisation PUK required   |
| 44  | service provider personalisation PIN required |
| 45  | service provider personalisation PUK required |
| 46  | corporate personalisation PIN required        |
| 47  | corporate personalisation PUK required        |
| 99  | resource limitation                           |
| 100 | unknown                                       |
| 103 | Illegal MS                                    |
| 106 | Illegal ME                                    |
| 107 | GPRS services not allowed                     |
| 111 | PLMN not allowed                              |
| 112 | Location area not allowed                     |
| 113 | Roaming not allowed in this location area     |
| 132 | service option not supported                  |
| 133 | requested service option not subscribed       |
| 134 | service option temporarily out of order       |
| 148 | unspecified GPRS error                        |
| 149 | PDP authentication failure                    |
| 150 | invalid mobile class                          |
| 160 | DNS resolve failed                            |
| 161 | Socket open failed                            |
| 171 | MMS task is busy now                          |
| 172 | The MMS data is oversize                      |
| 173 | The operation is overtime                     |
| 174 | There is no MMS receiver                      |
| 175 | The storage for address is full               |
| 176 | Not find the address                          |
| 177 | The connection to network is failed           |
| 178 | Failed to read push message                   |
| 179 | This is not a push message                    |
| 180 | gprs is not attached                          |
| 181 | tcpip stack is busy                           |
| 182 | The MMS storage is full                       |
| 183 | The box is empty                              |

|     |                                    |
|-----|------------------------------------|
| 184 | failed to save MMS                 |
| 185 | It is in edit mode                 |
| 186 | It is not in edit mode             |
| 187 | No content in the buffer           |
| 188 | Not find the file                  |
| 189 | Failed to receive MMS              |
| 190 | Failed to read MMS                 |
| 191 | Not M-Notification.ind             |
| 192 | The MMS inclosure is full          |
| 193 | Unknown                            |
| 600 | No Error                           |
| 601 | Unrecognized Command               |
| 602 | Return Value Error                 |
| 603 | Syntax Error                       |
| 604 | Unspecified Error                  |
| 605 | Data Transfer Already              |
| 606 | Action Already                     |
| 607 | Not At Cmd                         |
| 608 | Multi Cmd too long                 |
| 609 | Abort Cops                         |
| 610 | No Call Disc                       |
| 611 | BT SAP Undefined                   |
| 612 | BT SAP Not Accessible              |
| 613 | BT SAP Card Removed                |
| 614 | AT Not Allowed By Customer         |
| 753 | missing required cmd parameter     |
| 754 | invalid SIM command                |
| 755 | invalid File Id                    |
| 756 | missing required P1/2/3 parameter  |
| 757 | invalid P1/2/3 parameter           |
| 758 | missing required command data      |
| 759 | invalid characters in command data |
| 765 | Invalid input value                |
| 766 | Unsupported mode                   |
| 767 | Operation failed                   |
| 768 | Mux already running                |
| 769 | Unable to get control              |
| 770 | SIM network reject                 |

|     |                          |
|-----|--------------------------|
| 771 | Call setup in progress   |
| 772 | SIM powered down         |
| 773 | SIM file not present     |
| 791 | Param count not enough   |
| 792 | Param count beyond       |
| 793 | Param value range beyond |
| 794 | Param type not match     |
| 795 | Param format invalid     |
| 796 | Get a null param         |
| 797 | CFUN state is 0 or 4     |

## 20.2 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                                   |
|---------------|---|
| 1             | Unassigned(unallocated) number            |
| 3             | No route to destination                   |
| 6             | Channel unacceptable                      |
| 8             | Operator determined barring               |
| 10            | Call barred                               |
| 11            | Reserved                                  |
| 16            | Normal call clearing                      |
| 17            | User busy                                 |
| 18            | No user responding                        |
| 19            | User alerting, no answer                  |
| 21            | Short message transfer rejected           |
| 22            | Number changed                            |
| 25            | Pre-emption                               |
| 26            | Non-selected user clearing                |
| 27            | Destination out of service                |
| 28            | Invalid number format (incomplete number) |
| 29            | Facility rejected                         |
| 30            | Response to STATUS ENQUIRY                |

|     |  |
|-----|--|
| 32  | Normal, unspecified  |
| 34  | No circuit/channel available                                       |
| 38  | Network out of order   |
| 41  | Temporary failure  |
| 42  | Switching equipment Congestion                                     |
| 43  | Access information discarded                                       |
| 44  | Requested circuit/channel not available                            |
| 47  | Resources unavailable, unspecified                                 |
| 49  | Quality of service unavailable                                     |
| 50  | Requested facility not subscribed                                  |
| 55  | Requested facility not subscribed                                  |
| 57  | Bearer capability not authorized                                   |
| 58  | Bearer capability not presently available                          |
| 63  | Service or option not available, unspecified                       |
| 65  | Bearer service not implemented                                     |
| 68  | ACM equal or greater than ACM maximum                              |
| 69  | Requested facility not implemented                                 |
| 70  | Only restricted digital information bearer capability is available |
| 79  | Service or option not implemented, unspecified                     |
| 81  | Invalid transaction identifier value                               |
| 87  | User not member of CUG   |
| 88  | Incompatible destination   |
| 91  | Invalid transit network selection                                  |
| 95  | Semantically incorrect message                                     |
| 96  | Invalid mandatory information                                      |
| 97  | Message type non-existent or not implemented                       |
| 98  | Message type not compatible with protocol state                    |
| 99  | Information element non-existent or not implemented                |
| 100 | Conditional information element error                              |
| 101 | Message not compatible with protocol                               |
| 102 | Recovery on timer expiry   |
| 111 | Protocol error, unspecified  |
| 127 | Interworking, unspecified  |
| 128 | Telematic interworking not supported                               |
| 129 | Short message Type 0 not supported                                 |

|     |   |
|-----|---|
| 130 | Cannot replace short message                |
| 143 | Unspecified TP-PID error                    |
| 144 | Data coding scheme (alphabet) not supported |
| 145 | Message class not supported                 |
| 159 | Unspecified TP-DCS error                    |
| 160 | Command cannot be acted                     |
| 161 | Command unsupported                         |
| 175 | Unspecified TP-Command error                |
| 176 | TPDU not supported                          |
| 192 | SC busy                                     |
| 193 | No SC subscription                          |
| 194 | SC system failure                           |
| 195 | Invalid SME address                         |
| 196 | Destination SME barred                      |
| 197 | SM Rejected-Duplicate SM                    |
| 198 | TP-VPF not supported                        |
| 199 | TP-VP not supported                         |
| 208 | SIM SMS storage full                        |
| 209 | No SMS storage capability in SIM            |
| 210 | Error in MS                                 |
| 211 | Memory Capacity Exceeded                    |
| 212 | SIM Application Toolkit Busy                |
| 213 | SIM data download error                     |
| 224 | CP retry exceed                             |
| 225 | RP trim timeout                             |
| 226 | SMS connection broken                       |
| 255 | Unspecified error cause                     |
| 300 | ME failure                                  |
| 301 | SMS reserved                                |
| 302 | operation not allowed                       |
| 303 | operation not supported                     |
| 304 | invalid PDU mode                            |
| 305 | invalid text mode                           |
| 310 | SIM not inserted                            |
| 311 | SIM pin necessary                           |
| 312 | PH SIM pin necessary                        |

|     |  |
|-----|--|
| 313 | SIM failure  |
| 314 | SIM busy   |
| 315 | SIM wrong  |
| 316 | SIM PUK required                                     |
| 317 | SIM PIN2 required                                    |
| 318 | SIM PUK2 required                                    |
| 320 | memory failure                                       |
| 321 | invalid memory index                                 |
| 322 | memory full  |
| 323 | invalid input parameter                              |
| 324 | invalid input format                                 |
| 325 | invalid input value                                  |
| 330 | SMSC address unknown                                 |
| 331 | no network   |
| 332 | network timeout                                      |
| 340 | no cnma ack  |
| 500 | Unknown  |
| 512 | SMS no error   |
| 513 | Message length exceeds maximum length                |
| 514 | Invalid request parameters                           |
| 515 | ME storage failure                                   |
| 516 | Invalid bearer service                               |
| 517 | Invalid service mode                                 |
| 518 | Invalid storage type                                 |
| 519 | Invalid message format                               |
| 520 | Too many MO concatenated messages                    |
| 521 | SMSAL not ready                                      |
| 522 | SMSAL no more service                                |
| 523 | Not support TP-Status-Report & TP-Command in storage |
| 524 | Reserved MTI   |
| 525 | No free entity in RL layer                           |
| 526 | The port number is already registered                |
| 527 | There is no free entity for port number              |
| 528 | More Message to Send state error                     |
| 529 | MO SMS is not allow                                  |
| 530 | GPRS is suspended                                    |
| 531 | ME storage full                                      |
| 532 | Doing SIM refresh                                    |



## 20.3 Summary of Unsolicited Result Codes

| URC   | Description  | AT Command                             |
|---|--|--|
| +CRING: <type>  | Indicates incoming call to the TE if extended format is enabled.                         | AT+CRC=1                               |
| +CREG:<br><stat>[,<lac>,<ci>,<netact>]  | There is a change in the MT network registration status or a change of the network cell. | AT+CREG=<n>                            |
| +CMTI: <mem3>,<index>   | Indicates that new message has been received.  | AT+CNMI<br><mt>=1                      |
| +CMTI:<br><mem3>,<index>,"MMS<br>PUSH"  | Indicates that new MMS message has been received.  | AT+CNMI<br><mt>=1                      |
| +CMT:<br><length><CR><LF><pdu>  | Indicates that new message has been received.  | AT+CNMI<br><mt>=2 (PDU mode)           |
| +CMT:<br><oa>,<sects>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>                                | Indicates that new message has been received.  | AT+CNMI<br><mt>=2 (text mode)          |
| +CBM:<br><length><CR><LF><pdu>  | Indicates that new cell broadcast message has been received.                             | AT+CNMI<br><bm>=2 (PDU mode enabled):  |
| +CBM:<br><sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>  | Indicates that new cell broadcast message has been received.                             | AT+CNMI<br><bm>=2 (text mode enabled): |
| +CDS:<br><length><CR><LF><pdu>  | Indicates that new SMS status report has been received.                                  | AT+CNMI<br><ds>=1 (PDU mode enabled):  |
| +CDS:<br><fo>,<mr>[,<ra>][,<tora>],<sects>,<dt>,<st>  | Indicates that new SMS status report has been received.                                  | AT+CNMI<br><ds>=1 (text mode enabled): |
| *PSNWID: "<mcc>","<mnc>","<full network name>",<full network name CI>,<short network name>",<short network name CI> | Refresh network name by network.   | AT+CLTS=1                              |
| *PSUTTZ:<br><year>,<month>,<day>,<hour>,<min>,<sec>,<time   | Refresh time and time zone by network.   |  |

|   |  |                                  |
|---|--|----------------------------------|
| zone>",<dst>                              |  |                                  |
| <b>+CTZV:</b> "<time zone>"               | Refresh network time zone by network.  |                                  |
| <b>DST:</b> <dst>                         | Refresh Network Daylight Saving Time by network.   |                                  |
| <b>+CPIN:</b> <code>                      | Indicates whether some password is required or not.  | AT+CPIN                          |
| <b>+CPIN:</b> NOT READY                   | SIM Card is not ready.   |                                  |
| <b>+CPIN:</b> NOT INSERTED                | SIM Card is not inserted.  |                                  |
| <b>+CUSD:</b><br><n>[,<str_urc>[,<dc>]]   | Indicates an USSD response from the network, or network initiated operation.   | AT+CUSD=1                        |
| <b>NORMAL POWER DOWN</b>                  | SIM7000 is powered down by the PWRKEY pin or AT command "AT+CPOWD=1".  |                                  |
| <b>UNDER-VOLTAGE POWER DOWN</b>           | Under-voltage automatic power down.  |                                  |
| <b>UNDER-VOLTAGE WARNING</b>              | under-voltage warning  |                                  |
| <b>OVER-VOLTAGE POWER DOWN</b>            | Over-voltage automatic power down.   |                                  |
| <b>OVER-VOLTAGE WARNING</b>               | over-voltage warning   |                                  |
| <b>RDY</b>                                | Power on procedure is completed, and the module is ready to operate at fixed baud rate. (This URC does not appear when auto-bauding function is active). | AT+IPR=<rate><br><rate> is not 0 |
| <b>+CFUN:</b> <fun>                       | Phone functionality indication (This URC does not appear when auto-bauding function is active).  | AT+IPR=<rate><br><rate> is not 0 |
| [<n>,<n>]CONNECT OK                       | TCP/UDP connection is successful   | AT+CIPSTART                      |
| <b>CONNECT</b>                            | TCP/UDP connection in channel mode is successful   |                                  |
| [<n>,<n>]CONNECT FAIL                     | TCP/UDP connection fails   | AT+CIPSTART                      |
| [<n>,<n>]ALREADY CONNECT                  | TCP/UDP connection exists  | AT+CIPSTART                      |
| [<n>,<n>]SEND OK                          | Data sending is successful   |                                  |
| [<n>,<n>]CLOSED                           | TCP/UDP connection is closed   |                                  |
| <b>RCV FROM:</b> <IP ADDRESS>: <PORT>     | shows remote IP address and port (only in single connection mode)  | AT+CIPSRIP=1                     |
| <b>+IPD,</b> <data size>,<TCP/UDP>:<data> | display transfer protocol in IP header to received data or not (only in single connection mode)  | AT+CIPHEAD<br>AT+CIPSHOWTP       |
| <b>+RECEIVE,</b> <n>,<length>             | Received data from remote client (only in multiple connection mode)  |                                  |
| <b>REMOTE IP:</b> <IP ADDRESS>            | Remote client connected in   |                                  |

|   |                                  |            |
|---|----------------------------------|------------|
| <b>+CDNSGIP:</b> 1,<domain name>,<IP>[,<IP2>] | DNS successful                   | AT+CDNSGIP |
| <b>+CDNSGIP:</b> 0,<dns error code>           | DNS failed                       |            |
| <b>+PDP:</b> DEACT                            | GPRS is disconnected by network  |            |
| <b>+APP PDP:</b> ACTIVE                       | Active the network of app side   | AT+CNACT=1 |
| <b>+APP PDP:</b> DEACTIVE                     | Deactive the network of app side | AT+CNACT=0 |

## Contact

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