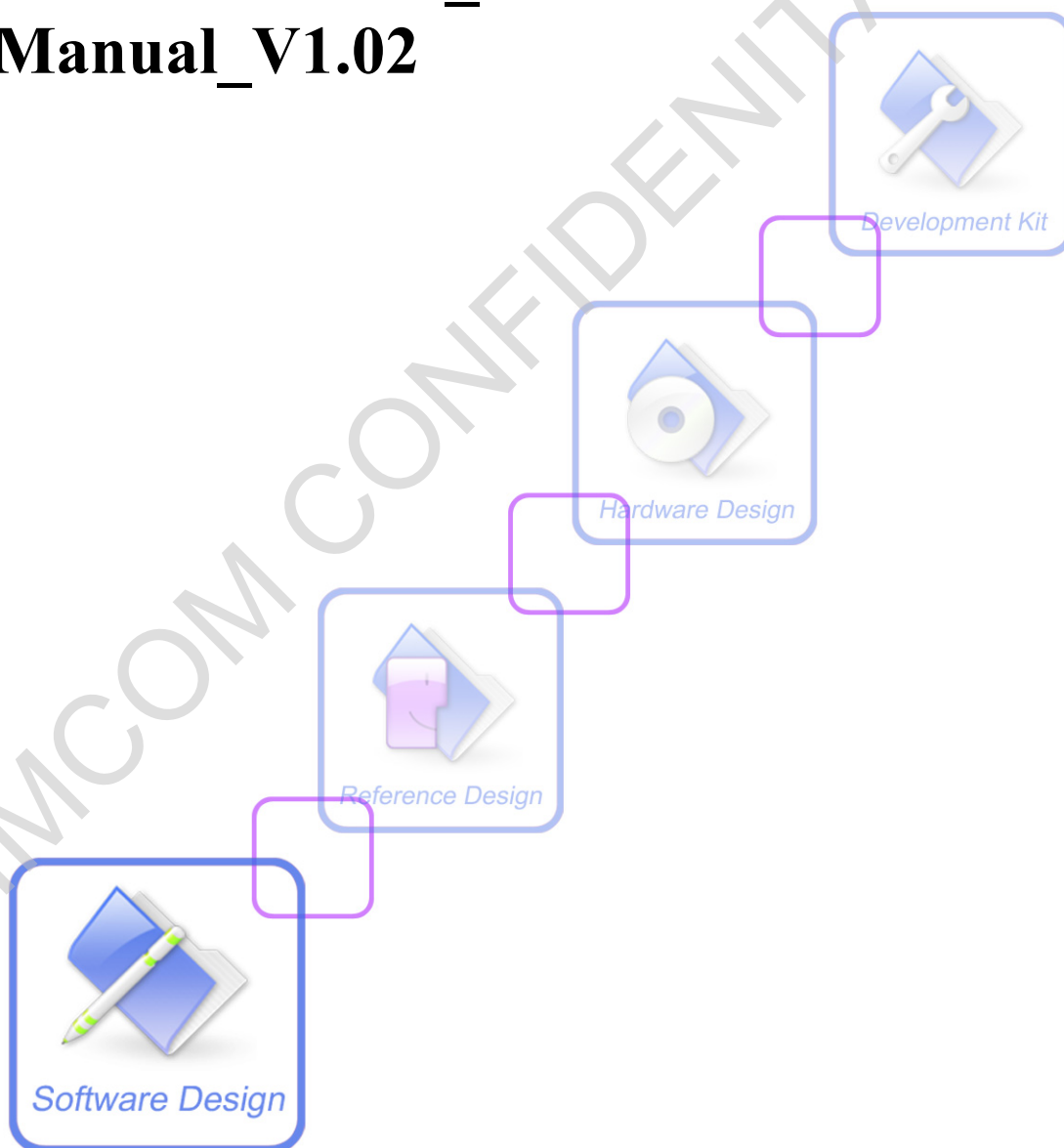




# **SIM7020 Series\_AT Command Manual\_V1.02**



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## Version History

| Version | Date       | Chapter  | What is new  |
|---------|------------|--|--|
| V1.00   | 2018-04-10 |  | New version  |
| V1.01   | 2018-07-16 | AT+CATWAKEUP<br>AT+CSGACT<br>4.2.3 AT+CLTS<br>4.2.15 AT+CPSMSTATUS<br>4.2.17 AT+CRESET<br>4.2.18 AT+CREVHEX<br>5.2.3 AT+CSOB<br>5.2.5 AT+CSODSEND<br>5.2.8 AT+CSORCVFLAG<br>7.2.8 AT+CHTTPPARA<br>10.2.3 +CMQDISCON<br>11.2.1 AT+CCOAPNEW<br>11.2.2 AT+CCOAPSEND<br>11.2.3 AT+CCOAPDEL<br>12.2.1 +CSNTP<br>14.2.2<br>AT+MIPLCREATEEXT<br>14.2.17<br>AT+MIPLBOOTSTRAPPA<br>RA<br>15 AT Commands for<br>NVRAM<br>16 AT Commands for CT<br>IOT Platform | Delete ATC<br>Delete ATC<br>Modify parameters<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC<br>Add test command<br>Add test command<br>Add test command<br>Modify parameters<br>Add ATC<br>Add ATC<br>Add ATC<br>Add ATC |
| V1.02   | 2018-12-13 | Scope<br>AT+CCOAPSTA<br>3.2.41 AT+IPCONFIG<br>3.2.54 AT+CEREG<br>3.2.55 AT+CGDATA<br>4.2.5 AT+CBANDSL<br>4.2.19 AT+CDISAUPDN   | Add SIM7020G<br>Delete command<br>Add command<br>Add command<br>Add command<br>Add command<br>Add command  |

|  |   |   |
|--|---|---|
|  | 4.2.20 AT+CNWRCCFG                            | Add command   |
|  | 4.2.21 AT+CURTC                               | Add command   |
|  | 4.2.22 AT+CHOMENW                             | Add command   |
|  | 4.2.23 AT+CBATCHK                             | Add command   |
|  | 4.2.24 AT+CGPIO                               | Add command   |
|  | 4.2.25 AT*MEDRXCFC                            | Add command   |
|  | 5.2.4 AT+RETENTION                            | Add command   |
|  | 5.2.12 AT+CSOALIVE                            | Add command   |
|  | Chapter 6                                     | AT Commands for TCPIP Application Toolkit to Compatible with SIM800 Serials |
|  | 7.2.2   | Add command   |
|  | AT+CHTTPCREATEEXT                             |   |
|  | 7.2.7   | Add command   |
|  | AT+CHTTPSENDEXT                               |   |
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|  | 7.2.10  | Add command   |
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|  | 7.2.11  | Add command   |
|  | AT+CHTTPCLRMULSND BUF                         |   |
|  | 7.2.12  | Add command   |
|  | AT+CHTTPRESUMESEND                            |   |
|  | 7.2.16 +CHTTPTOFS                             | Add command   |
|  | 7.2.17 +CHTTPTOFSOK                           | Add command   |
|  | 10.2.8 AT+CMQALICFG                           | Add command   |
|  | 10.2.9 AT+CMQALICON                           | Add command   |
|  | 16.2.4 AT+CM2MCLIGET                          | Add command   |
|  | Chapter 17 AT Commands for Network Command-DM | Add ATC   |
|  | Chapter 18 AT Commands for FOTA               | Add ATC   |
|  | Chapter 19 Supported Unsolicited Result Codes | Add   |
|  | Chapter 21 ATC Differences among              | Add ATC   |

SIMCOM CONFIDENTIAL FILE

# 1 Introduction

## 1.1 Scope of the document

This document presents the AT Command Set for SIMCom SIM7020 Series, including SIM7020C, SIM7020E, SIM7020G, SIM7030 and SIM7060.

## 1.1 Related documents

You can visit the SIMCom Website using the following link:

<http://www.simcom.com>

## 1.2 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.

## 1.3 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 SIM7020 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 SIM7020 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:

### 1.3.1 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.

### 1.3.2 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.

### 1.3.3 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.                                   |

### 1.3.4 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 2048 characters (counted from the first

command without "AT" or "at" prefix). If the characters entered exceeded this number then none of the Command will be executed and TA will return **"ERROR"**.

### 1.3.5 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.

## 1.4 Supported character sets

The SIM7020 Series AT Command interface defaults to the **IRA** character set. The SIM7020 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.

## 1.5 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. SIM7020 Series support both two kinds of flow control.

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

### 1.5.1 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 SIM7020 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.

**1.5.2 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.

**1.6 Definitions****1.6.1 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.
- **AT&W\_SAVE**: The parameter of the current AT command will be kept in NVRAM by sending the command of "AT&W".
- -: "-" means this AT command doesn't care the parameter saving mode.

**1.6.2 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   |
|---------|---|
| ATE     | Set command echo mode   |
| ATI     | Display product identification information  |
| ATL     | Set monitor speaker loudness  |
| ATM     | Set monitor speaker mode  |
| ATN1    | Some PC modem driver initial setting to handshake at highest speed larger than S37            |
| ATO     | Switch from command mode to data mode   |
| ATP     | Select pulse dialling   |
| ATQ     | Set result code presentation mode   |
| ATS0    | Set number of rings before automatically answering the call                                   |
| ATS1    | Ring counter  |
| ATS2    | Set escape sequence character   |
| 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                             |
| ATS12   | Set escape code guard time  |
| ATS25   | Set DTR change time   |
| ATS95   | Some PC modem driver initial setting to enable extended result codes                          |
| ATT     | Select Tone Dialing   |
| 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&K      | Flow control setting                                   |
| AT&V      | Display current configuration                          |
| AT&W      | Store Active Profile                                   |
| AT+DR     | V.42bis data compression reporting control             |
| AT+DS     | V.42bis data compression control                       |
| 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+ILRR   | Set TE-TA Local rate reporting mode                    |
| AT+IPR    | Set TE-TA fixed local rate                             |
| AT+FCLASS | Set Fax Class  |

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

### 2.1.1 ATE Set Command Echo Mode

| ATE Set Command Echo Mode                    |  |
|--|--|
| Execution Command<br><b>ATE&lt;value&gt;</b> | <p>Response</p> <p>This setting determines whether or not the TA echoes characters received from TE during Command state.</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;value&gt;</b>    0   Echo mode off<br/>                  1   Echo mode on</p> |
| Parameter Saving Mode                        |  |
| Max Response Time                            | -  |
| Reference V.25ter                            | Note   |

### 2.1.2 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><b>SIM7020 R1752</b><br><br><b>OK</b> |
| Parameter Saving Mode           | NO_SAVE   |
| Max Response Time               | -   |
| Reference V.25ter               | Note  |

### 2.1.3 ATL Set Monitor Speaker Loudness

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

### 2.1.4 ATM Set Monitor Speaker Mode

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

### 2.1.5 ATN1 some PC modem driver initial setting to handshake at highest speed larger than S37

| ATN1 Some PC modem driver initial setting to handshake at highest speed larger than S37 |                       |
|---|-----------------------|
| Execution Command<br><b>ATN1</b>  | Response<br><b>OK</b> |
|   | Parameters            |
| Parameter Saving Mode   | NO_SAVE               |
| Max Response Time   | -                     |
| Reference V.25ter   | Note                  |

### 2.1.6 ATO Switch from Command Mode to Data Mode

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

### 2.1.7 ATP Select Pulse Dialling

| ATP Select Pulse Dialling |
|---------------------------|
|---------------------------|



|                                 |                          |
|---------------------------------|--------------------------|
| Execution Command<br><b>ATP</b> | Response<br><b>OK</b>    |
| Parameter Saving Mode           | NO_SAVE                  |
| Max Response Time               | -                        |
| Reference V.25ter               | Note<br>No effect in GSM |

### 2.1.8 ATQ Set Result Code Presentation Mode

| ATQ Set Result Code Presentation Mode    |  |
|--|--|
| Execution Command<br><b>ATQ&lt;n&gt;</b> | <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</p> <p>&lt;n&gt;     <u>0</u>   TA transmits result code<br/>          1    Result codes are suppressed and not transmitted</p> |
| Parameter Saving Mode                    |  |
| Max Response Time                        | -  |
| Reference V.25ter                        | <p>Note</p> <p>This command only affects V.250 AT commands and not all other AT commands in this specification (either 3GPP or MediaTek proprietary).</p>  |

### 2.1.9 ATS0 Set Number of Rings before Automatically Answering the Call

| ATS0 Set Number of Rings before Automatically Answering the Call |  |
|--|--|
| Read Command<br><b>ATS0?</b>                                     | <p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Write Command  | Response   |

|                       |   |
|-----------------------|---|
| <b>ATS0=&lt;n&gt;</b> | <p>This parameter setting determines the number of rings before auto-answer.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b>     <u>0</u>     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 <b>&lt;n&gt;</b> 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> |

#### 2.1.10    **ATS1    Ring Counter**

| <b>ATS1    Ring counter</b>         |   |
|-------------------------------------|---|
| Read Command <b>ATS1?</b>           | <p>Response</p> <p><b>&lt;n&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command <b>ATS1=&lt;n&gt;</b> | <p>Response</p> <p>This command will not alert the RING counter,but simply display</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b>     The number of "RING" strings sent to the TE as a result of receiving an incoming call.</p> <p>          0-255</p> |
| Parameter Saving Mode               | AT&W_SAVE   |
| Max     Response Time               | -   |

|                      |   |
|----------------------|---|
| Reference<br>V.25ter | Note<br>If "RING" is not displayed on a particular channel due to other settings (such as suppression of all unsolicited events (ATQ)) then this value should not be incremented. This value is reset to 0 when receiving a new incoming call. Note that this command should also be made channel specific as with other ATS<x> commands. |
|----------------------|---|

### 2.1.11 ATS2 Set Escape Sequence Character

| ATS3 Set Escape Sequence Character |  |
|------------------------------------|--|
| Read Command<br>ATS2?              | Response<br><n><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br>ATS2=<n>          | Response<br>This parameter setting determines the character recognized by the TA to indicate the escape sequence.<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><n> 0-43-255 escape sequence character<br>Note: default 43 = '+' |
| Parameter Saving Mode              | AT&W_SAVE  |
| Max Response Time                  | -  |
| Reference<br>V.25ter               | Note   |

### 2.1.12 ATS3 Set Command Line Termination Character

| ATS3 Set Command Line Termination Character |   |
|---|---|
| Read Command<br>ATS3?                       | Response<br><n><br><br><b>OK</b><br><br>Parameters<br>See Write Command         |
| Write Command<br>ATS3=<n>                   | Response<br>This parameter setting determines the character recognized by TA to |

|                       |   |
|-----------------------|---|
|                       | <p>terminate an incoming command line. The TA also returns this character in output.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> |
|                       | <p>Parameters</p> <p>&lt;n&gt;     0-<u>13</u>-127    Command line termination character</p>  |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference V.25ter     | <p>Note</p> <p>Default 13 = CR. It only supports default value.</p>   |

### 2.1.13 ATS4 Set Response Formatting Character

| ATS4 Set Response Formatting Character |   |
|--|---|
| Read Command<br>ATS4?                  | <p>Response</p> <p>&lt;n&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>ATS4=<n>              | <p>Response</p> <p>This parameter setting determines the character generated by the TA for result code and information text.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;n&gt;     0-<u>10</u>-127    Response formatting character</p> |
| Parameter Saving Mode                  | -   |
| Max Response Time                      | -   |
| Reference V.25ter                      | <p>Note</p> <p>Default 10 = LF. It only supports default value.</p>   |

### 2.1.14 ATS5 Set Command Line Editing Character

| ATS5 Set Command Line Editing Character |                                  |
|---|----------------------------------|
| Read Command<br>ATS5?                   | <p>Response</p> <p>&lt;n&gt;</p> |

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

#### 2.1.15 ATS6 Pause Before Blind Dialling

| <b>ATS6 Pause Before Blind Dialling</b> |   |
|---|---|
| Read Command<br><b>ATS6?</b>            | Response<br><b>&lt;n&gt;</b><br><br><b>OK</b> |
| Write Command<br><b>ATS6=&lt;n&gt;</b>  | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|   | Parameters<br><b>&lt;n&gt;</b> 0-2-10 Time    |
| Parameter Saving Mode                   | AT&W_SAVE                                     |
| Max Response Time                       | -   |
| Reference<br>V.25ter                    | Note<br>No effect in GSM                      |

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

| <b>ATS7 Set Number of Seconds to Wait for Connection Completion</b> |
|---|
|---|

|  |   |
|--|---|
| Read Command<br><b>ATS7?</b>           | Response<br><b>&lt;n&gt;</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>ATS7=&lt;n&gt;</b> | 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><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;n&gt;</b> 1- <u>60</u> -255 Number of seconds to wait for connection completion  |
| Parameter Saving Mode                  | AT&W_SAVE   |
| Max Response Time                      | -   |
| Reference<br>V.25ter                   | Note<br>If called party has specified a high value for <b>ATS0=&lt;n&gt;</b> , call setup may fail. The correlation between <b>ATS7</b> and <b>ATS0</b> is important<br>Example: Call may fail if <b>ATS7=30</b> and <b>ATS0=20</b> .<br><b>ATS7</b> is only applicable to data call. |

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

| <b>ATS8 Set Number of Seconds to Wait for Comma Dial Modifier Encountered in Dial String of D Command</b> |   |
|---|---|
| Read Command<br><b>ATS8?</b>  | Response<br><b>&lt;n&gt;</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>ATS8=&lt;n&gt;</b>  | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|   | Parameters<br><b>&lt;n&gt;</b> 0 no pause when comma encountered in dial string<br>1- <u>2</u> -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 |

### 2.1.18 AT510 Set Disconnect Delay after Indicating the Absence of Data Carrier

| AT510 Set Disconnect Delay after Indicating the Absence of Data Carrier |   |
|---|---|
| Read Command AT510?   | Response<br><n><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command AT510=<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.<br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><n> 1-15-254 Number of tenths seconds of delay |
| Parameter Saving Mode   | -   |
| Max Response Time   | -   |
| Reference V.25ter   | Note<br>This command is not used, as there have been issues with in-band DCD dropping unexpectedly for CSD calls on some networks.  |

### 2.1.19 AT512 Set Escape Code Guard Time

This command sets the escape code guard time in fiftieths of a second. The escape guard time is used to measure when to detect the +++ escape sequence has been entered by the PC in order to drop out of data mode back to AT command mode.

The guard time determines the time that forms a guard period before and after three escape sequence characters. In order to distinguish an escape sequence from just three escape sequence characters in the data stream there is timing associated to the three escape sequence characters of an escape sequence.

The time between the last byte of the data stream and the first escape sequence character must be at least the guard time and the time between each escape sequence character of the escape



sequence must be less than the guard time and no other byte is received after the third escape sequence character for the time of the guard time. If an escape sequence is detected, the OK result code will be sent to the DTE. Otherwise, the DCE will stay in data mode.

For example: "<Guard time>+++<Guard time>"

| ATS12 Set Escape Code Guard Time |  |
|----------------------------------|--|
| Read Command<br>ATS12?           | Response<br><n><br><br><b>OK</b><br><br>NB: <n> is in 3 decimal digits format (e.g. Default value is given as 050).<br>If error is related to wrong AT syntax:<br><b>+CME ERROR: &lt;err&gt;</b> |
|                                  | Parameters<br>See Write Command  |
| Write Command<br>ATS12=<n>       | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
|                                  | Parameters<br><n>      0-50-255    Number of 20 ms.  |
| Parameter Saving Mode            | AT&W_SAVE  |
| Max Response Time                | -  |
| Reference V.25ter                | Note   |

### 2.1.20 ATS25 Set DTR Change Time

This command sets the S-register 25 Detect DTR change time that contain the threshold for noticing a change in DTR. This time permits to the modem to ignore DTR before taking action specified by &Dn (See AT&D Circuit 108 behavior).

The value unit is in 1/100 seconds. Default value is set to 5 (50ms delay after a DTR drop before the modem acts on it).

| ATS25 Set DTR Change Time |  |
|---------------------------|--|
| Read Command<br>ATS25?    | Response<br><n><br><br><b>OK</b><br><br>NB: <n> is in 3 decimal digits format (e.g. Default value is given as 000).<br>If error is related to wrong AT syntax:<br><b>+CME ERROR: &lt;err&gt;</b> |

|   |   |
|---|---|
|   | Parameters<br>See Write Command             |
| Write Command<br><b>ATS25=&lt;n&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b> |
|   | Parameters<br><n> 0-255 Number of 10 ms.    |
| Parameter Saving Mode                   | AT&W_SAVE                                   |
| Max Response Time                       | -   |
| Reference V.25ter                       | Note  |

#### 2.1.21 ATS95 Some PC Modem Driver Initial Setting to Enable Extended Result Codes

| ATS95 Some PC Modem Driver Initial Setting to Enable Extended Result Codes |  |
|--|--|
| Read Command<br><b>ATS95?</b>  | Response<br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>ATS95=&lt;n&gt;</b>                                    | Response<br><b>OK</b><br><br>Some standard PC modem drivers will send this AT command to initialize the setting, but it is meaningless in the 3gpp standard. So we just return OK and no effect for the setting. |
|  | Parameters<br><n> 0-255 Meaningless for the GSM, and GPRS/Packet Domain setting .  |
| Parameter Saving Mode  | AT&W_SAVE  |
| Max Response Time  | -  |
| Reference V.25ter  | Note   |

#### 2.1.22 ATT Select Tone Dialing

| ATT Select Tone Dialing |
|-------------------------|
|-------------------------|

|                                 |                       |
|---------------------------------|-----------------------|
| Execution Command<br><b>ATT</b> | Response<br><b>OK</b> |
| Parameter Saving Mode           | AUTO_SAVE             |
| Max Response Time               | -                     |
| Reference V.25ter               | Note                  |

### 2.1.23 ATV TA Response Format

| ATV TA Response Format                       |  |
|--|--|
| Execution Command<br><b>ATV&lt;value&gt;</b> | <p>Response</p> <p>This parameter setting determines the contents of the header and trailer 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;</p> <p>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;&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                        | AT&W_SAVE  |
| 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                          |

#### 2.1.24 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>or</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  | AT&W_SAVE   |
| Max Response Time  | -   |
| Reference V.25ter  | Note  |

### 2.1.25 ATZ Reset Default Configuration

| ATZ Reset Default Configuration   |  |
|-----------------------------------|--|
| Execution Command<br>ATZ[<value>] | Response<br>TA sets all current parameters to the user defined profile.<br><b>OK</b><br>or<br><b>ERROR</b><br>Parameters<br><value> <u>0</u> Restore profile 0 |
| Parameter Saving Mode             | NO_SAVE  |
| Max Response Time                 | -  |
| Reference V.25ter                 | Note   |

Parameter impacted by Z command: refer to AT&W, and IFC will be set too.

### 2.1.26 AT&C Set DCD Function Mode

| AT&C Set DCD Function Mode       |  |
|----------------------------------|--|
| Execution Command<br>AT&C<value> | Response<br>This parameter determines how the state of circuit 109 (DCD) relates to the detection of received line signal from the distant end.<br><b>OK</b><br>or<br><b>ERROR</b><br>Parameters<br><value> <u>0</u> DCD line is always ON<br><u>1</u> DCD line is ON only in the presence of data carrier |
| Parameter Saving Mode            | -  |
| Max Response Time                | -  |
| Reference V.25ter                | Note   |

### 2.1.27 AT&D Set DTR Function Mode

| AT&D Set DTR Function Mode |  |
|----------------------------|--|
| Execution Command          | Response<br>This parameter determines how the TA responds when circuit 108/2 (DTR) |

|                       |  |
|-----------------------|--|
| AT&D[<value>]         | <p>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>&lt;value&gt;    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 V.25ter     | Note   |

## 2.1.28 AT&F Factory Defined Configuration

| AT&F Factory Defined Configuration |  |
|------------------------------------|--|
| Execution Command                  | Response   |
| AT&F[<value>]                      | <p>TA sets all current parameters to the manufacturer defined profile.</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;value&gt;    0    Set all TA parameters to manufacturer defaults.</p> |
| Parameter Saving Mode              | NO_SAVE  |
| Max Response Time                  | -  |
| Reference V.25ter                  | Note   |

Parameter impacted by &F command: refer to AT&W, and IFC will be set too.

## 2.1.29 AT&K Flow Control Setting

| AT&K Flow Control Setting |   |
|---------------------------|---|
| Execution Command         | Response  |
| AT&K[<value>]             | <p><b>OK</b></p> <p>Parameters</p> <p>&lt;value&gt;    0    No flow control</p> <p>              3    RTS /CTS flow control (hardware)</p> <p>              4    XON/XOFF flow control (software)</p> |

|                       |   |
|-----------------------|---|
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | <p>Note</p> <p>This command does not store anything in the profile data because it sets the AT+IFC settings when used:</p> <ul style="list-style-type: none"> <li>● AT&amp;K0 is equivalent of entering AT+IFC=0,0</li> <li>● AT&amp;K3 is equivalent of entering AT+IFC=2,2</li> <li>● AT&amp;K4 is equivalent of entering AT+IFC=1,1</li> </ul> |

### 2.1.30 AT&V Display Current Configuration

| AT&V Display Current Configuration |   |
|------------------------------------|---|
| Execution Command<br>AT&V[<n>]     | <p>Response</p> <p>TA returns the current parameter setting.</p> <p><b>&lt;current configurations text&gt;</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> 0 Responses in numeric format</p> |
| Parameter Saving Mode              | NO_SAVE   |
| Max Response Time                  | -   |
| Reference V.25ter                  | Note  |

### 2.1.31 AT&W Store Active Profile

| AT&W Store Active Profile      |   |
|--------------------------------|---|
| Execution Command<br>AT&W[<n>] | <p>Response</p> <p>TA stores the current parameter setting in the user defined profile.</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> 0 Store the current configuration in profile 0</p> |
| Parameter Saving Mode          | NO_SAVE   |
| Max Response Time              | -   |



|           |  |
|-----------|--|
| Reference | Note   |
| V.25ter   | The user defined profile is stored in non volatile memory. |

#### Parameter stored by &W

| Command    | Parameter name        | Displayedby &V |
|------------|-----------------------|----------------|
| ATS0       | <num>                 | Y              |
| ATS3       | <char>                | Y              |
| ATS4       | <char>                | Y              |
| ATS5       | <char>                | Y              |
| ATS6       | <short>               | Y              |
| ATS7       | <time>                | Y              |
| ATS8       | <time>                | Y              |
| ATS10      | <time>                | Y              |
| ATV        | <format>              | Y              |
| ATE        | <echo>                | Y              |
| ATQ        | <result>              | Y              |
| ATX        | <result>              | Y              |
| AT&C       | <behavior>            | Y              |
| AT&D       | <behavior>            | Y              |
| AT+CLTS    | <timestamp>           | Y              |
| AT+CREG    | <n>                   | Y              |
| AT+CGREG   | <n>                   | Y              |
| AT+CMEE    | <n>                   | Y              |
| AT+CSCS    | <chest>               | Y              |
| AT+CSMINS  | <n>                   | Y              |
| AT+EXUNSOL | <exunsol>             | Y              |
| AT+IPR     | <n>                   | Y              |
| AT+IFC     | <TA_by_TE>,<TE_by_TA> | Y              |

#### 2.1.32 AT+DR V.42bis data compression reporting control

| AT+DR V.42bis data compression reporting control |  |
|--|--|
| Test Command<br>AT+DR=?                          | Response<br>+DR: (list of supported <value>s)<br><br><b>OK</b> |
|  | Parameters<br>See Write Command                                |
| Read Command<br>AT+DR?                           | Response<br>+DR: <value>                                       |

|   |   |
|---|---|
|   | <b>OK</b><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+DR=&lt;value&gt;</b> | Response<br>This parameter setting determines whether the intermediate result code of the current data compressing is reported by TA to TE after a connection establishment.<br><b>OK</b><br>Parameters<br><value>    0    Reporting disabled<br>1    Reporting enabled |
| Parameter Saving Mode                       | NO_SAVE   |
| Max Response Time                           | -   |
| Reference V.25ter                           | Note  |

### 2.1.33 AT+DS V.42bis data compression control

| AT+DS V.42bis data compression control  |   |
|---|---|
| Test Command<br><b>AT+DS=?</b>  | Response<br>+DS: (list of supported <p0>s), (list of supported <n>s), (list of supported <p1>s), (list of supported <p2>s)<br><b>OK</b><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+DS?</b>   | Response<br>+DS: <p0>,<n>,<p1>,<p2><br><b>OK</b><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+DS=[&lt;p0&gt;,&lt;n&gt;,&lt;p1&gt;,&lt;p2&gt;]</b><br><b>  </b> | Response<br>This parameter setting determines the possible data compression mode by TA at the compression negotiation with the remote TA after a call set up.<br><b>OK</b><br>Parameters<br><p0>    0    NONE<br>1    transmit only |

|                       |   |
|-----------------------|---|
|                       | <p>2 receive only</p> <p>3 both direction, but allow negotiation</p> <p>&lt;n&gt; 0 allow negotiation of p0 down</p> <p>1 do not allow negotiation of p0 - disconnect on difference</p> <p>&lt;p1&gt; 512-1024 dictionary size</p> <p>Note: default determined by manufacturer</p> <p>&lt;p2&gt; 6-20-64 maximum string size (default 20)</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | <p>Note</p> <p>only for data call</p> <p>GSM transmits the data transparent. The remote TA may support this compression.</p>  |

#### 2.1.34 AT+GCAP Request Complete TA Capabilities List

| AT+GCAP Request Complete TA Capabilities List |   |
|---|---|
| Execution Command<br>AT+GCAP                  | <p>Response</p> <p>TA reports a list of additional capabilities.</p> <p>+GCAP: 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 V.25ter                             | Note  |

#### 2.1.35 AT+GMI Request Manufacturer Identification

| AT+GMI Request Manufacturer Identification |                                  |
|--|----------------------------------|
| Test Command<br>AT+GMI=?                   | <p>Response</p> <p><b>OK</b></p> |
|  | <p>Parameters</p>                |

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

### 2.1.36 AT+GMM Request TA Model Identification

| <b>AT+GMM Request TA Model Identification</b> |   |
|---|---|
| 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<br>V.25ter                          | Note  |

### 2.1.37 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>&lt;revision&gt;</b> |

|                       |  |
|-----------------------|--|
|                       | <b>OK</b>  |
|                       | Parameters<br><b>&lt;revision&gt;</b> Revision of software release |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference V.25ter     | Note   |

### 2.1.38 AT+GOI Request Global Object Identification

| AT+GOI Request Global Object Identification |  |
|---|--|
| Test Command<br><b>AT+GOI=?</b>             | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+GOI</b>          | Response<br>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.<br><b>&lt;Object Id&gt;</b><br><br><b>OK</b><br>Parameters<br><b>&lt;Object Id&gt;</b> Identifier of device type<br>see X.208, 209 for the format of <Object Id> |
| Parameter Saving Mode                       | NO_SAVE  |
| Max Response Time                           | -  |
| Reference V.25ter                           | Note   |

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

| AT+GSN Request TA Serial Number Identification(IMEI) |  |
|--|--|
| Test Command<br><b>AT+GSN=?</b>                      | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+GSN</b>                   | Response<br>TA reports the IMEI (international mobile equipment identifier) number in information text which permit the user to identify the individual ME device. |

|                       |  |
|-----------------------|--|
|                       | <b>&lt;sn&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;sn&gt;</b> IMEI of the telephone(International Mobile station Equipment Identity) |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference V.25ter     | Note<br>The serial number (IMEI) is varied by individual ME device.  |

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

| AT+ICF Set TE-TA Control Character Framing                     |   |
|--|---|
| Test Command<br><b>AT+ICF=?</b>                                | Response<br><b>+ICF:</b> (list of supported <b>&lt;format&gt;</b> s),(list of supported <b>&lt;parity&gt;</b> s)<br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+ICF?</b>                                 | Response<br><b>+ICF:</b> <b>&lt;format&gt;</b> , <b>&lt;parity&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+ICF=&lt;format&gt;[,&lt;parity&gt;]</b> | Response<br>This parameter setting determines the serial interface character framing format and parity received by TA from TE.<br><br><b>OK</b><br><br>Parameters<br><b>&lt;format&gt;</b> 1   8 data 0 parity 2 stop<br>2   8 data 1 parity 1 stop<br>3   8 data 0 parity 1 stop<br>4   7 data 0 parity 2 stop<br>5   7 data 1 parity 1 stop<br>6   7 data 0 parity 1 stop<br><b>&lt;parity&gt;</b> 0   odd<br>1   even<br>2   mark(1) |

|                       |   |
|-----------------------|---|
|                       | <u>3</u> space (0)  |
| Parameter Saving Mode | AT&W_SAVE   |
| Max Response Time     | -   |
| Reference V.25ter     | <p>Note</p> <p>The Command is applied for Command state;</p> <p>In <b>&lt;format&gt;</b> parameter, "0 parity" means no parity;</p> <p>The <b>&lt;parity&gt;</b> field is ignored if the <b>&lt;format&gt;</b> field specifies no parity and string "+ICF: <b>&lt;format&gt;</b>,255" will be response to "AT+ICF? " Command.</p> |

## 2.1.41 AT+ICF Set TE-TA Local Data Flow Control

| AT+ICF Set TE-TA Local Data Flow Control            |  |
|---|--|
| Test Command<br>AT+ICF=?                            | <p>Response</p> <p>+ICF: (list of supported <b>&lt;dce_by_dte&gt;</b>s),(list of supported <b>&lt;dte_by_dce&gt;</b>s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+ICF?                             | <p>Response</p> <p>+ICF: <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>AT+ICF=<dce_by_dte>[,<dte_by_dce>] | <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> <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul> <p><b>&lt;dte_by_dce&gt;</b> Specifies the method will be used by TA at receive of data from TE</p> <ul style="list-style-type: none"> <li><u>0</u> No flow control</li> <li>1 Software flow control</li> <li>2 Hardware flow control</li> </ul> |

|                       |           |
|-----------------------|-----------|
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time     | -         |
| Reference V.25ter     | Note      |

#### 2.1.42 AT+ILRR Set TE-TA Local rate reporting mode

| AT+ILRR Set TE-TA Local rate reporting mode |  |
|---|--|
| Test Command<br>AT+ILRR=?                   | <p>Response</p> <p><b>+ILRR:</b> (list of supported &lt;value&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br>AT+ILRR?                    | <p>Response</p> <p><b>+ILRR:</b> &lt;value&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+ILRR=<value>            | <p>Response</p> <p>This parameter setting determines whether an intermediate result code of local rate is reported at connection establishment. The rate is applied after the result code of the connection is transmitted to TE.</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;value&gt;</p> <p>0 Disables reporting of local port rate</p> <p>1 Enables reporting of local port rate</p> |
| Parameter Saving Mode                       | AT&W_SAVE  |
| Max Response Time                           | -  |
| Reference V.25ter                           |  |

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

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



|   |  |
|---|--|
|   | fixed-only <rate>s)  |
|   | <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>  |
|   | 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.<br><b>OK</b> |
|   | Parameters<br><b>&lt;rate&gt;</b> Baud rate per second<br>0<br>110<br>300<br>1200<br>2400<br>4800<br>9600<br>19200<br>38400<br>57600<br>115200<br>230400<br>460800<br>921600<br>3000000  |
|   |  |
| Parameter Saving Mode                       | AUTO_SAVE  |
| Max Response Time                           | -  |
| Reference V.25ter                           | Note<br>Factory setting is "AT+IPR=0"(auto-bauding).   |

#### 2.1.44 AT+FCLASS Set Fax Class

##### AT+FCLASS Set Fax Class

|   |   |
|---|---|
| Test Command<br><b>AT+FCLASS=?</b>          | <p>Response</p> <p><b>+FCLASS:</b> (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+FCLASS?</b>           | <p>Response</p> <p><b>+FCLASS:</b> &lt;n&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+FCLASS=&lt;n&gt;</b> | <p>Response</p> <p>This command has no effect in NB-IoT and is supported for compatibility reasons.</p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;n&gt;    <u>0</u>    Data<br/>         1    Fax class 1 (TIA-578-A)</p> |
| Parameter Saving Mode                       | AT&W_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+CEER   | Extended error report  |
| AT+CGMI   | Request manufacturer identification                                |
| AT+CGMM   | Request model identification                                       |
| AT+CGMR   | Request TA revision identification of software release             |
| AT+CGOI   | Request global object identification                               |
| AT+CGSN   | Request product serial number identification (identical with +GSN) |
| AT+CIMI   | Request international mobile subscriber identity                   |
| AT+CLCK   | Facility lock  |
| AT+CMAR   | Master reset   |
| AT+CMEE   | Report mobile equipment error                                      |
| AT+COPS   | Operator selection   |
| AT+CPIN   | Enter PIN  |
| AT+CPWD   | Change password  |
| AT+CR     | Service reporting control  |
| AT+CREG   | Network registration   |
| AT+CRSM   | Restricted SIM access  |
| AT+CSCS   | Select TE character set  |
| AT+CSQ    | Signal quality report  |
| AT+CMUX   | Multiplexer control  |
| AT+CNUM   | Subscriber number  |
| AT+CPOL   | Preferred operator list  |
| AT+CFUN   | Set phone functionality  |
| AT+CCLK   | Clock  |
| AT+CSIM   | Generic SIM access   |
| AT+CBC    | Battery charge   |
| AT+CTZR   | Time zone reporting  |
| AT+CTZU   | Automatic time zone update   |
| AT+CPLS   | Selection of preferred PLMN list                                   |
| AT+CPSMS  | Power saving mode selection  |
| AT+CIPCA  | Enable/disable activation of PDN connection on attach.             |
| AT+CEDRXS | eDRX setting   |

|              |  |
|--------------|--|
| AT+CEDRXDP   | eDRX read dynamic parameters                 |
| AT+CCHO      | Open UICC logical channel                    |
| AT+CCHC      | Close UICC logical channel                   |
| AT+CGLA      | Generic UICC logical channel access          |
| AT+CPINR     | Remaining PIN retries                        |
| AT+CGATT     | GPRS/Packet Domain attach or detach          |
| AT+CGDCONT   | Define PDP context                           |
| AT+CGACT     | PDP context activate or deactivate           |
| AT+CGPADDR   | Show PDP address                             |
| AT+IPCONFIG  | Show the Complete PDP Address                |
| AT+CGEREP    | Packet Domain Event Reporting                |
| AT+CGREG     | Network registration status                  |
| AT+CGCONTRDP | PDP Context Read Dynamic Parameters          |
| AT+CGPIAF    | Printing IP Address Format                   |
| AT+CGDEL     | Delete Non-Active PDP Contexts               |
| AT+CGAUTH    | Define PDP Context Authentication Parameters |
| AT*MCGDEFCON | Set Default PSD Connection Settings          |
| AT*MSACL     | Enable/Disable ACL feature                   |
| AT*MLACL     | Display ACL List                             |
| AT*MWACL     | Write an ACL entry                           |
| AT*MDACL     | Delete an ACL entry                          |
| AT+CNBIOTDT  | NB-IOT Data Type                             |
| AT+CEREG     | EPS Network Registration Status              |
| AT+CGDATA    | Enter Data State                             |

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

### 3.2.1 AT+CEER Extended Error Report

| AT+CEER Extended Error Report |   |
|-------------------------------|---|
| Test Command<br>AT+CEER=?     | Response<br>+CEER: (list of supported <n>s)<br><br>OK |
|                               | Parameters<br>See Write Command                       |
| Read Command                  | Response  |

|                                 |   |
|---------------------------------|---|
| AT+CEER?                        | +CEER: <n>  |
|                                 | OK  |
| Write Command<br>AT+CEER=<n>    | Parameters<br>See Write Command   |
|                                 | Response<br>OK  |
| Execution<br>Command<br>AT+CEER | Parameter<br><n>    0    The reason for last call release as text code<br>1    The reason for last call release as number code  |
|                                 | Response<br>TA returns an extended report of the reason for the last call release.<br>+CEER: <report><br><br>OK   |
|                                 | Parameters<br><report>   If AT+CEER=0,   return <s><br><s>   a string that represents the Cause<br>If AT+CEER=1,   return<br>Cause: <c><br><c>   number representing the Cause  |
|                                 | Parameters<br><c>(number)   <s>(string)<br>0       (No cause)<br>1       (unassigned (unallocated) number)<br>3       (no route to destination)<br>6       (channel unacceptable)<br>8       (operator determined barring)<br>16       (normal call clearing)<br>17       (user busy)<br>18       (no user responding)<br>19       (user alerting, no answer)<br>21       (call rejected)<br>22       (number changed)<br>26       (non-selected user clearing)<br>27       (destination out of order)<br>28       (invalid number format (incomplete number))<br>29       (facility rejected)<br>30       (response to STATUS ENQUIRY) |

|     |  |
|-----|--|
| 31  | (normal, unspecified)  |
| 34  | (emergency call not possible)  |
| 38  | (network out of order)   |
| 41  | (temporary failure)  |
| 42  | (switching equipment congestion)                                     |
| 43  | (access information discarded)                                       |
| 44  | (requested circuit/channel not available)                            |
| 47  | (resource unavailable, unspecified)                                  |
| 49  | (quality of service unavailable)                                     |
| 50  | (Requested facility not subscribed)                                  |
| 55  | (Incoming calls barred within the CUG)                               |
| 57  | (bearer capability not authorized)                                   |
| 58  | (bearer capability not presently available)                          |
| 63  | (service or option not available, unspecified)                       |
| 68  | (ACM equal to or greater than ACMmax)                                |
| 65  | (bearer service not implemented)                                     |
| 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 IE error)   |
| 101 | (message not compatible with protocol state)                         |
| 102 | (recovery on timer expiry)   |
| 111 | (protocol error, unspecified)  |
| 127 | (interworking, unspecified)  |

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

### 3.2.2 AT+CGMI Request Manufacturer Identification

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

### 3.2.3 AT+CGMM Request Model Identification

| AT+CGMM Request Model Identification |   |
|--------------------------------------|---|
| 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> |
|                                      | <b>OK</b>   |
|                                      | 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 |

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

| AT+CGMR Request TA Revision Identification of Software Release |  |
|--|--|
| 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>&lt;revision&gt;</b><br><br><b>OK</b> |
|  | Parameters<br><b>&lt;revision&gt;</b> Product software version identification text                               |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference<br>3GPP TS 27.007<br>[13]                            | Note   |

### 3.2.5 AT+CGOI Request global object identification

| AT+CGOI Request global object identification |   |
|--|---|
| Test Command<br><b>AT+CGOI=?</b>             | Response<br><b>OK</b>   |
| Execution Command<br><b>AT+CGOI</b>          | Response<br>TA returns global object id.<br><b>&lt;Object Id&gt;</b><br><br><b>OK</b> |
|  | Parameters<br><b>&lt;Object Id&gt;</b> Identifier of device type                      |
| Parameter Saving Mode                        | NO_SAVE   |
| Max Response Time                            | -   |



|                                     |      |
|-------------------------------------|------|
| Reference<br>3GPP TS 27.007<br>[13] | Note |
|-------------------------------------|------|

### 3.2.6 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><b>&lt;sn&gt;</b><br><br><b>OK</b>                     |
|  | Parameters<br><b>&lt;sn&gt;</b> International mobile equipment identity (IMEI) |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference<br>3GPP TS 27.007<br>[13]  | Note   |

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

| AT+CIMI Request International Mobile Subscriber Identity |  |
|--|--|
| Test Command<br><b>AT+CIMI=?</b>                         | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CIMI</b>                      | Response<br>TA returns <b>&lt;IMSI&gt;</b> for identifying the individual SIM which is attached to ME.<br><b>&lt;IMSI&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;IMSI&gt;</b> International Mobile Subscriber Identity (string without double quotes)  |
| Parameter Saving Mode                                    | NO_SAVE  |
| Max Response   | 20s  |

|                                     |      |
|-------------------------------------|------|
| Time                                |      |
| Reference<br>3GPP TS 27.007<br>[13] | Note |

### 3.2.8 AT+CLCK Facility Lock

| AT+CLCK Facility Lock   |  |
|---|--|
| Test Command<br><b>AT+CLCK=?</b>  | <p>Response</p> <p><b>+CLCK:</b> (list of supported &lt;fac&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+CLCK=&lt;fac&gt;,&lt;mode&gt;[,&lt;passwd&gt;[,&lt;class&gt;]]</b> | <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: &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> "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><b>&lt;mode&gt;</b></p> <ul style="list-style-type: none"> <li>0 unlock</li> <li>1 lock</li> <li>2 query status</li> </ul> <p><b>&lt;passwd&gt;</b> 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><b>&lt;class&gt;</b> Field not required for NB-IOT, so will be ignored</p> <p><b>&lt;status&gt;</b></p> <ul style="list-style-type: none"> <li>0 Not active</li> <li>1 Active</li> </ul> |

|                                     |  |
|-------------------------------------|--|
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | 15s  |
| Reference<br>3GPP TS 27.007<br>[14] | Note <ul style="list-style-type: none"> <li>● CME errors if SIM not inserted or PIN is not entered.</li> </ul> |

### 3.2.9 AT+CMAR Master Reset

| AT+CMAR Master Reset                           |   |
|--|---|
| Test Command<br>AT+CMAR=?                      | Response<br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br>AT+CMAR=<p<br>hone lock code> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>                               |
|  | Parameters<br><phone lock code> string type; Security code (Phone Lock code) must be verified before performing the master reset. |
| Parameter Saving Mode                          | NO_SAVE   |
| Max Response Time                              | -   |
| Reference<br>3GPP TS 27.007<br>[13]            | Note  |

### 3.2.10 AT+CMEE Report Mobile Equipment Error

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

|  |   |
|--|---|
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CME=[&lt;n&gt;]</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:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b></p> <ul style="list-style-type: none"> <li><b>0</b> Disable <b>+CME ERROR: &lt;err&gt;</b> result code and use ERROR instead.</li> <li><b>1</b> Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use numeric <b>&lt;err&gt;</b></li> <li><b>2</b> Enable <b>+CME ERROR: &lt;err&gt;</b> result code and use verbose <b>&lt;err&gt;</b> values</li> </ul> |
| Parameter Saving Mode                      | -   |
| Max Response Time                          | -   |
| Reference<br>3GPP TS 27.007<br>[13]        | Note  |

### 3.2.11 AT+COPS Operator Selection

| AT+COPS Operator Selection       |   |
|----------------------------------|---|
| 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;AcT&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:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p> |
| Read Command                     | Response  |

|   |   |
|---|---|
| <p><b>AT+COPS?</b></p>  | <p>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.</p> <p><b>+COPS: &lt;mode&gt;[,&lt;format&gt;,&lt;oper&gt;,&lt;AcT&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>  |
| <p>Write Command</p> <p><b>AT+COPS=&lt;mode&gt;[,&lt;format&gt;[,&lt;oper&gt;[,&lt;AcT&gt;]]]</b></p> | <p>Response</p> <p>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>).</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;stat&gt;</b></p> <ul style="list-style-type: none"> <li>0 Unknown</li> <li>1 Operator available</li> <li>2 Operator current</li> <li>3 Operator forbidden</li> </ul> <p><b>&lt;oper&gt;</b> Refer to [27.007]<br/>operator in format as per <b>&lt;format&gt;</b></p> <p><b>&lt;mode&gt;</b></p> <ul style="list-style-type: none"> <li><u>0</u> Automatic mode; <b>&lt;oper&gt;</b> field is ignored</li> <li>1 Manual (<b>&lt;oper&gt;</b> field shall be present, and <b>&lt;AcT&gt;</b> optionally)</li> <li>2 Manual deregister from network</li> <li>3 Set only <b>&lt;format&gt;</b> (for read Command <b>+COPS?</b>) - not shown in Read Command response</li> <li>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</li> </ul> <p><b>&lt;format&gt;</b></p> <ul style="list-style-type: none"> <li><u>0</u> Long format alphanumeric <b>&lt;oper&gt;</b></li> <li>1 Short format alphanumeric <b>&lt;oper&gt;</b></li> <li>2 Numeric <b>&lt;oper&gt;</b>; GSM Location Area Identification number</li> </ul> <p><b>&lt;AcT&gt;</b> 9 NB-IoT</p> |
| <p>Parameter Saving Mode</p>  | <p>AUTO_SAVE</p>  |
| <p>Max Response Time</p>  | <p>-</p>  |

|                                     |      |
|-------------------------------------|------|
| Reference<br>3GPP TS 27.007<br>[14] | Note |
|-------------------------------------|------|

### 3.2.12 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> <p>READY MT is not pending for any password</p> <p>SIM PIN MT is waiting SIM PIN to be given</p> <p>SIM PUK MT is waiting for SIM PUK to be given</p> <p>PH_SIM PIN ME is waiting for phone to SIM card (antitheft)</p> <p>PH_SIM PUK ME is waiting for SIM PUK (antitheft)</p> <p>SIM PIN2 PIN2, e.g. for editing the FDN book possible only if preceding Command was acknowledged with +CME ERROR:17</p> <p>SIM PUK2 Possible only if preceding Command was acknowledged with error +CME ERROR: 18.</p> <p>PH-SIM PIN ME is waiting for phone to SIM card (antitheft)</p> <p>PH-NET PIN Network personalization password is required.</p> <p>PH-NETSUB PIN Network subset is required.</p> <p>PH-SP PIN Service provider personalization password is required.</p> <p>PH-CORP PIN Corporate personalization password is required.</p> |
| Write Command<br><b>AT+CPIN=&lt;pin&gt;[,&lt;new pin&gt;]</b> | <p>Response</p> <p>TA stores a required password (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message, +CME ERROR, is returned to TE.</p> <p>If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin,&lt;new pin&gt;, is used to replace the old pin in the SIM.</p> <p>When a new password is set, a third optional parameter may also be specified. This extra parameter is compared to the new password to check they are equivalent as an additional security feature.</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;pin&gt;</b> String type; password</p> <p><b>&lt;new pin&gt;</b> String type; If the PIN required is SIM PUK or SIMPUK2: new password</p> |
| Parameter Saving Mode         | NO_SAVE   |
| Max Response Time             | 5s  |
| Reference 3GPP TS 27.007 [13] | Note  |

### 3.2.13 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 <b>&lt;fac&gt;</b>s, list of supported <b>&lt;pwdlength&gt;</b>s)</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;fac&gt;</b> See Write Command</p> <p><b>&lt;pwdlength&gt;</b> Integer max. length of password</p>   |
| Write Command<br><b>AT+CPWD=&lt;fac&gt;<br/>&gt;,&lt;oldpwd&gt;,&lt;newpwd&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><b>&lt;fac&gt;</b> "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><b>&lt;oldpwd&gt;</b> 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, <b>&lt;oldpwd&gt;</b> is not to enter.</p> <p><b>&lt;newpwd&gt;</b> String type (string should be included in quotation marks): new password</p> |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | 15s   |

|                                     |      |
|-------------------------------------|------|
| Reference<br>3GPP TS 27.007<br>[13] | Note |
|-------------------------------------|------|

### 3.2.14 AT+CR Service Reporting Control

| AT+CR Service Reporting Control       |   |
|---------------------------------------|---|
| Test Command<br>AT+CR=?               | Response<br>+CR: (list of supported <mode>s)<br><br><b>OK</b>   |
|                                       | Parameters<br>See Write Command   |
| Read Command<br>AT+CR?                | Response<br>+CR: <mode><br><br><b>OK</b>  |
|                                       | Parameters<br>See Write Command   |
| Write Command<br>AT+CR=[<mode>]<br>>] | Response<br>TA controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE at a call set up.<br><br><b>OK</b>  |
|                                       | Parameters<br><mode><br>0 Disable<br>1 Enable<br>2 Enable MediaTek proprietary intermediate result code<br><br>Intermediate result code<br>If enabled, an intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. <b>CONNECT</b> ) is transmitted.<br>+CR: <serv><br><serv> GPRS[<L2P>] GPRS / Packet Switched connection<br><L2P> M-PT Packet Transport mechanism protocol for a PDP such as IP |
| Parameter Saving Mode                 | NO_SAVE   |
| Max Response Time                     | -   |



|                                     |   |
|-------------------------------------|---|
| Reference<br>3GPP TS 27.007<br>[13] | Note<br><L2P> value M-PT is MTK proprietary and represents no <L2p> but raw IP packet transfer. |
|-------------------------------------|---|

### 3.2.15 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>[,<AcT>]]<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;]</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><n><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 <b>+CREG:</b> &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;[,&lt;AcT&gt;]]</li> </ul> <stat> <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> |

|                                     |  |
|-------------------------------------|--|
|                                     | <p>6 Registered for "SMS only", home network (applicable only when &lt;Act&gt; indicates NB-IOT)</p> <p>7 Registered for "SMS only", roaming (applicable only when &lt;Act&gt; indicates NB-IOT)</p> <p>&lt;lac&gt; String type (string should be included in quotation marks); two byte location area code in hexadecimal format</p> <p>&lt;ci&gt; String type (string should be included in quotation marks); four byte cell ID in hexadecimal format</p> <p>&lt;AcT&gt; Access technology of the registered network 9 NB-IoT</p> <p>Unsolicited Result Code</p> <p>If &lt;n&gt;=1 and there is a change in the MT network registration status</p> <p><b>+CREG: &lt;stat&gt;</b></p> <p>If &lt;n&gt;=2 and there is a change in the MT network registration status or a change of the network cell:</p> <p><b>+CREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt; [,&lt;AcT&gt;]]</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Parameter Saving Mode               | -  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.16 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;file Id&gt;[,&lt;P1&gt;,&lt;P2&gt;,&lt;P3&gt;[,&lt;data&gt;[,&lt;pathid&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:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;Command&gt;</b></p> <p>176 READ BINARY</p> <p>178 READ RECORD</p> <p>192 GET RESPONSE</p> <p>214 UPDATE BINARY</p> |

|  |   |
|--|---|
|  | <p>220 UPDATE RECORD</p> <p>242 STATUS</p> <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 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> <p><b>&lt;pathid&gt;</b> String type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102.211 (e.g. "7F205F70" in SIM and UICC case). The &lt;pathid&gt; only used in the mode "select path from MF" as defined in ETSI TS 102.211.</p> |
| Parameter Saving Mode                    | NO_SAVE   |
| Max Response Time                        | -   |
| Reference<br>3GPP TS 27.007<br>GSM 11.11 | Note  |

### 3.2.17 AT+CSCS Select TE Character Set

| AT+CSCS Select TE Character Set |   |
|---------------------------------|---|
| Test Command<br>AT+CSCS=?       | <p>Response</p> <p><b>+CSCS:</b> (list of supported <b>&lt;chset&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;chset&gt;</b> "GSM" GSM 7 bit default alphabet (3GPP TS 23.038);<br/> "UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC10646); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99<br/> "IRA" International reference alphabet (ITU-T T.50)</p> |

|   |  |
|---|--|
|   | <p>"HEX" Character strings consist only of hexadecimal characters from 00 to FF;</p> <p>"PCCP" PC character set Code</p> <p>"PCDN" PC Danish/Norwegian character set</p> <p>"8859-1" ISO 8859 Latin 1 character set</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                         | AT&W_SAVE  |
| Max Response Time                             | -  |
| Reference<br>3GPP TS 27.007<br>[13]           | Note   |

### 3.2.18 AT+CSQ Signal Quality Report

| <b>AT+CSQ Signal Quality Report</b> |   |
|-------------------------------------|---|
| Test Command<br><b>AT+CSQ=?</b>     | <p>Response</p> <p><b>+CSQ: (list of supported &lt;rssis&gt;),(list of supported &lt;bers&gt;)</b></p> <p><b>OK</b></p>   |
| Execution Command<br><b>AT+CSQ</b>  | <p>Response</p> <p><b>+CSQ: &lt;rssis&gt;,&lt;bers&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>Execution Command returns received signal strength indication &lt;rssis&gt; and channel bit error rate &lt;bers&gt; from the ME. Test Command returns values</p> |

|                               |   |
|-------------------------------|---|
|                               | supported by the TA.  |
|                               | Parameters<br><b>&lt;rss&gt;</b> Integer type. Rx signal strength level<br>0 -110 dBm or less<br>1 -109 dBm ≤ rssi < -107 dBm<br>2 -107 dBm ≤ rssi < -105 dBm<br>3...30 -105dBm ≤ rssi < -48 dBm<br>31 -48dBm ≤ rssi<br>99 Not known or not detectable<br><b>&lt;ber&gt;</b> (in percent):<br>0...7 As RXQUAL values in the table in GSM 05.08 [20] subclause 7.2.4<br>99 Not known or not detectable |
| Parameter Saving Mode         | NO_SAVE   |
| Max Response Time             | -   |
| Reference 3GPP TS 27.007 [13] | Note  |

### 3.2.19 AT+CMUX Multiplexer Control

#### AT+CMUX Multiplexer Control

|                           |   |
|---------------------------|---|
| Test Command<br>AT+CMUX=? | Response<br>+CMUX: (list of supported <mode>s),(list of supported <subset>s),(list of supported<port_speed>s),(list of supported<N1>s),(list of supported<T1>s),(list of supported<N2>s),(list if supported<T2>s),(list of supported <T3>s),<list of supported <k>s)<br><br><b>OK</b><br><br>Parameters<br>See Read Command |
| Read Command<br>AT+CMUX?  | Response:<br>+CMUX:<br>[<mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k>]     ]<br><br><b>OK</b><br>or<br><b>ERROR</b><br><br>Parameters<br><mode>   |

|  |   |
|--|---|
|  | <p>1 Multiplexer not active<br/>0 27.010 multiplexer</p> <p><b>&lt;subset&gt;</b> The way in which the multiplexer control channel is set up<br/>0 UIH frames used only</p> <p><b>&lt;port_speed&gt;</b> Transmission rate<br/>1 9600 bits/t<br/>2 19200 bits/t<br/>3 38400 bits/t<br/>4 57600 bits/t<br/>5 115200 bit/s<br/>6 230400 bits/t<br/>7 460800 bits/t<br/>Proprietary values, available if MUX NEW PORT<br/>SPEED FTR is activated</p> <p><b>&lt;N1&gt;</b> Maximum frame size<br/>1-4096 (default value 31 for basic option)</p> <p><b>&lt;T1&gt;</b> Acknowledgement timer in units of ten milliseconds<br/>1-255 Default:10 (100 ms)</p> <p><b>&lt;N2&gt;</b> Maximum number of re-transmissions<br/>0-100 Default:3</p> <p><b>&lt;T2&gt;</b> Max Response Timer for the multiplexer control channel in units of ten milliseconds<br/>2-255 Default:30</p> <p><b>&lt;T3&gt;</b> Wake up Max Response Timers in seconds<br/>1-255 Default:10</p> <p><b>&lt;k&gt;</b> Window size, for Advanced operation with Error Recovery options<br/>1-7 Default:2</p> |
| Write Command<br><b>AT+CMUX=&lt;mode&gt;[,&lt;subset&gt;[,&lt;port_speed&gt;[,&lt;N1&gt;[,&lt;T1&gt;[,&lt;N2&gt;[,&lt;T2&gt;[,&lt;T3&gt;[,&lt;k&gt;]]]]]]]</b> | <p>Response</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> Multiplexer transparency mechanism<br/>0 Basic option</p>   |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference<br>3GPP TS 27.007 [13]   | <p>Note</p> <ul style="list-style-type: none"> <li>The values of &lt;subset&gt;,&lt;port_speed&gt;,&lt;N1&gt;,&lt;T&gt;,&lt;N2&gt;,&lt;T2&gt;,&lt;T3&gt;,&lt;k&gt; are only relevant to the 27.010 MUX control channel.</li> <li>&lt;port_speed&gt; set to 0 will set the MUX port rate at whatever the</li> </ul>  |

AT+IPR setting is for the channel.

### 3.2.20 AT+CNUM Subscriber Number

| AT+CNUM Subscriber Number           |  |
|-------------------------------------|--|
| Test Command<br><b>AT+CNUM=?</b>    | Response<br><b>OK</b>  |
| Execution Command<br><b>AT+CNUM</b> | <p>Response</p> <p><b>+CNUM: [&lt;alpha1&gt;],&lt;number1&gt;,&lt;type1&gt;</b><br/> <b>[&lt;CR&gt;&lt;LF&gt;+CNUM:[&lt;alpha2&gt;],&lt;number2&gt;,&lt;type2&gt;</b><br/> <b>[...]]</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;alpha&gt;</b> Optional alphanumeric string associated with <b>&lt;number&gt;</b>; used character set should be the one selected with Command Select TE Character Set <b>+CSCS</b>.</p> <p><b>&lt;number&gt;</b> String type (string should be included in quotation marks) phone number of format specified by <b>&lt;type&gt;</b></p> <p><b>&lt;type&gt;</b> 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<br>3GPP TS 27.007 [13]    | Note   |

### 3.2.21 AT+CPOL Preferred Operator List

| AT+CPOL Preferred Operator List  |   |
|----------------------------------|---|
| Test Command<br><b>AT+CPOL=?</b> | <p>Response</p> <p><b>+CPOL: (list of supported &lt;index&gt;s),(list of supported &lt;format&gt;s)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Read Command<br><b>AT+CPOL?</b>  | <p>Response</p> <p><b>+CPOL:</b><br/> <b>&lt;index1&gt;,&lt;format&gt;,&lt;oper1&gt;[,&lt;GSM_AcT1&gt;,&lt;GSMcomp_AcT1&gt;,&lt;UT</b></p>                              |

|  |  |
|--|--|
|  | <p>RAN_AcT1&gt;,&lt;E-UTRAN_Act1]</p> <p>[&lt;CR&gt;&lt;LF&gt;+CPOL: &lt;index2&gt;,&lt;format&gt;,&lt;oper2&gt;</p> <p>],&lt;GSM_AcT2&gt;,&lt;GSMcomp_AcT2&gt;,&lt;UTRAN_AcT2,&lt;E-UTRAN_AcT2&gt;]</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>] | <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 format used (see +COPS Command)</p> <p>0 Long format alphanumeric <b>&lt;oper&gt;</b></p> <p>1 Short format alphanumeric <b>&lt;oper&gt;</b></p> <p>2 Numeric <b>&lt;oper&gt;</b></p> <p><b>&lt;oper&gt;</b> String type(string should be included in quotation marks)</p> <p><b>&lt;GSM_AcTn&gt;</b> GSM Access technology;</p> <p>0 Access technology not selected</p> <p>1 Access technology selected</p> <p><b>&lt;GSM_Comp_AcTn&gt;</b> GSM compact Access technology;</p> <p>0 Access technology not selected</p> <p>1 Access technology selected</p> <p><b>&lt;UTRAN_AcTn&gt;</b> UTRA Access technology;</p> <p>0 Access technology not selected</p> <p>1 Access technology selected</p> <p><b>&lt;E-UTRAN_AcTn&gt;</b> E-UTRAN Access technology;</p> <p>0 Access technology not selected</p> <p>1 Access technology selected</p> |
| Parameter Saving Mode                              | -  |
| Max Response Time                                  | -  |
| Reference<br>3GPP TS 27.007 [13]                   | <p>Note</p> <p>Not all USIMs support the preferred operator list.</p>  |



### 3.2.22 AT+CFUN Set Phone Functionality

| AT+CFUN Set Phone Functionality        |  |
|--|--|
| Test Command<br>AT+CFUN=?              | <p>Response</p> <p>+CFUN: (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</p> <p>See Write Command</p>   |
| Read Command<br>AT+CFUN?               | <p>Response</p> <p>+CFUN: &lt;fun&gt;</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>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>&lt;fun&gt;</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>7 Disable phone SIM only. Transmit and receive circuits still active</li> </ul> <p>&lt;rst&gt;</p> <ul style="list-style-type: none"> <li><u>0</u> Set it to &lt;fun&gt; power level now, but do not reset the MT</li> <li>1 Do not set it to &lt;fun&gt; power level, either do not reset the MT before rebooting</li> <li>2 Set it to &lt;fun&gt; power level now, and reset the MT after rebooting</li> </ul> |
| Parameter Saving Mode                  | -  |
| Max Response Time                      | 10s  |
| Reference<br>3GPP TS 27.007            | Note   |

[13]

### 3.2.23 AT+CCLK Clock

| AT+CCLK Clock                       |  |
|-------------------------------------|--|
| Test Command<br>AT+CCLK=?           | Response<br><b>OK</b>  |
| Read Command<br>AT+CCLK?            | Response<br><b>+CCLK: &lt;time&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>AT+CCLK=<time>     | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>  |
|                                     | Parameters<br><time> String type, format is: yy/MM/dd,hh:mm:ss±zz, where characters indicate year (two last digits),month, day, hour, minutes, seconds and time zone. E.g. 10/05/06,00:01:52+08. |
| Parameter Saving Mode               | AUTO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note<br>If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?   |

### 3.2.24 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: |

|                                     |  |
|-------------------------------------|--|
|                                     | <b>+CME ERROR: &lt;err&gt;</b><br>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   |

### 3.2.25 AT+CBC Battery Charge

| AT+CBC Battery Charge       |  |
|-----------------------------|--|
| Test Command<br>AT+CBC=?    | Response<br><b>+CBC: (list of supported &lt;bcl&gt;),(&lt;voltage&gt;)</b><br><br><b>OK</b><br>Parameters<br>See Execution Command   |
| Execution Command<br>AT+CBC | Response<br><b>+CBC: &lt;bcl&gt;,&lt;voltage&gt;</b><br><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;bcl&gt;</b> Battery connection level<br>0...100 battery has 1-100 percent of capacity remaining vent<br><b>&lt;voltage&gt;</b> Battery voltage(mV) |
| Parameter Saving Mode       | NO_SAVE  |
| Max Response Time           | -  |
| Reference                   | Note   |

3GPP TS 27.007  
[13]

### 3.2.26 AT+CTZR Time Zone Reporting

| AT+CTZR Time Zone Reporting                   |  |
|---|--|
| Test Command<br><b>AT+CTZR=?</b>              | <p>Response<br/><b>+CTZR:</b> (list of supported <b>&lt;onoff&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br><b>AT+CTZR?</b>               | <p>Response<br/><b>+CTZR:</b> <b>&lt;onoff&gt;</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR:</b> <b>&lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CTZR=&lt;onoff&gt;</b> | <p>Response<br/><b>OK</b></p> <p>If error is related to ME functionality:<br/><b>+CME ERROR:</b> <b>&lt;err&gt;</b></p> <p><b>Unsolicited result code:</b><br/><b>+CTZV:</b> <b>&lt;zone&gt;</b></p> <p>Parameters<br/><b>&lt;onoff&gt;</b></p> <p>    0   Disable time zone event reporting<br/>    1   Enable time zone event reporting</p> <p><b>&lt;zone&gt;</b> String type value; On behalf of the time zone, range -47...+48. The eastern region is denoted as "+32".</p> |
| Parameter Saving Mode                         | AUTO_SAVE_REBOOT   |
| Max Response Time                             | -  |
| Reference<br>3GPP TS 27.007<br>[13]           | Note   |

### 3.2.27 AT+CTZU Automatic Time Update

| AT+CTZU Automatic Time Update       |   |
|-------------------------------------|---|
| Test Command<br>AT+CTZU=?           | Response<br>+CTZU: (list of supported <onoff>s)<br><br><b>OK</b>  |
|                                     | Parameters<br>See Write Command   |
| Read Command<br>AT+CTZU?            | Response<br>+CTZU: <onoff><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>AT+CTZU=<onoff>    | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b>                       |
|                                     | Parameters<br><onoff><br>0   Disable automatic time update via NITZ<br>1   Automatic time update via NITZ                 |
| Parameter Saving Mode               | AUTO_SAVE_REBOOT  |
| Max Response Time                   | -   |
| Reference<br>3GPP TS 27.007<br>[13] | Note  |

### 3.2.28 AT+CPLS Selection of preferred PLMN List

| AT+CPLS Selection of Preferred PLMN List |   |
|--|---|
| Test Command<br>AT+CPLS=?                | Response<br>+CPLS: (list of supported <list>s)<br><br><b>OK</b> |
|  | Parameters<br>See Write Command                                 |

|  |   |
|--|---|
| Read Command<br><b>AT+CPLS?</b>              | <p>Response</p> <p><b>+CPLS: &lt;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></p>  |
|  | <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CPLS=&lt;list&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;list&gt;</b></p> <p>    0 User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNSel (this file is only on SIM card or GSM application in UICC).</p> <p>    1 Operator controlled PLMN selector with Access Technology EFOPLMNwAcT</p> <p>    2 HPLMN selector with Access Technology EFHPLMNwACT</p> |
| Parameter Saving Mode                        | NO_SAVE   |
| Max Response Time                            | -   |
| Reference<br>3GPP TS 27.007 [13]             | Note  |

### 3.2.29 AT+CPSMS Power Saving Mode Setting

| AT+CPSMS Power Saving Mode Setting |   |
|------------------------------------|---|
| Test Command<br><b>AT+CPSMS=?</b>  | <p>Response</p> <p><b>+CPSMS: (list of supported &lt;mode&gt;s),(list of supported &lt;Requested_Periodic-RAU&gt;s),(list of supported &lt;Requested_GPRS-READY-timer&gt;s),(list of supported &lt;Requested_Periodic-TAU&gt;s),(list of supported &lt;Requested_Active-Time&gt;s)</b></p> <p><b>OK</b></p> |
|                                    | <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CPSMS?</b>   | <p>Response</p> <p><b>+CPSMS:</b></p>   |

|  |  |
|--|--|
|  | <p>&lt;mode&gt;,&lt;Requested_Periodic-RAU&gt;,&lt;Requested_GPRS-READY-timer&gt;,&lt;Requested_Periodic-TAU&gt;,&lt;Requested_Active-Time&gt;]</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>  |
| <p>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;,&lt;Requested_Active-Time&gt;]</b></p> | <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>&lt;mode&gt; Integer type. Indication to disable or enable the use of PSM in the UE.</p> <ul style="list-style-type: none"> <li>0 Disable the use of PSM</li> <li>1 Enable the use of PSM</li> <li>2 Disable the use of PSM and discard all parameters for PSM or, if available reset to the manufacturer specific default values.</li> </ul> <p>&lt;Requested_Periodic-RAU&gt; N/A for NB-IoT</p> <p>&lt;Requested_GPRS-READY-timer&gt; N/A for NB-IoT</p> <p>&lt;Requested_Periodic-TAU&gt; 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 Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401. The default value, if available, is manufacturer specific.</p> <p>&lt;Requested_Active-Time&gt; 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 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682, 3GPP TS 23.060 and 3GPP TS 23.401. The default value, if available, is manufacturer specific.</p> |
| <p>Parameter Saving Mode</p>   | <p>NO_SAVE</p>   |
| <p>Max Response Time</p>   | <p>-</p>   |
| <p>Reference<br/>3GPP TS 27.007</p>  | <p>Note</p>  |

[13]

### 3.2.30 AT+CCIOTOPT CIoT optimization configuration

| AT+CCIOTOPT CIoT Optimization Configuration   |   |
|---|---|
| Test Command<br><b>AT+CCIOTOP<br/>T=?</b>   | <p>Response</p> <p><b>+CCIOTOPT:</b> (list of supported &lt;n&gt;s),(list of supported &lt;supported_UE_opt&gt;s),(list of supported &lt;preferred_UE_opt&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br><b>AT+CCIOTOP<br/>T?</b>  | <p>Response</p> <p><b>+CCIOTOPT:</b> &lt;n&gt;,&lt;supported_UE_opt&gt;,&lt;preferred_UE_opt&gt;</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>See Write Command</p>   |
| Write Command<br><b>AT+CCIOTOP<br/>T=[&lt;n&gt;,&lt;supported_UE_opt&gt;,&lt;preferred_UE_opt&gt;]<br/>  </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>&lt;n&gt; Integer type, enables or disables reporting of unsolicited result code +CCIOTOPTI.</p> <ul style="list-style-type: none"> <li>0 Disable reporting.</li> <li>1 Enable reporting.</li> <li>2 Disable reporting and reset the parameters for CIoT EPS optimization to the default values.</li> </ul> <p>&lt;supported_UE_opt&gt; Integer type; indicates the UE's support for CIoT EPS optimizations.</p> <ul style="list-style-type: none"> <li>1 Support for control plane CIoT EPS optimization.</li> <li>3 Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimization.</li> </ul> <p>&lt;preferred_UE_opt&gt; Integer type; indicates the UE's preference for CIoT EPS optimizations.</p> <ul style="list-style-type: none"> <li>0 No preference</li> <li>1 Preference for control plane CIoT EPS optimization</li> <li>2 Preference for user plane CIoT EPS optimization</li> </ul> |
| Parameter Saving Mode   | NO_SAVE   |



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

### 3.2.31 AT+CEDRXS eDRX Setting

| AT+CEDRXS eDRX Setting   |   |
|--|---|
| Test Command<br>AT+CEDRXS=?  | <p>Response</p> <p><b>+CEDRXS:</b> (list of supported &lt;mode&gt;s),(list of supported &lt;AcT-type&gt;s),(list of supported &lt;Requested_eDRX_value&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br>AT+CEDRXS?   | <p>Response</p> <p><b>[+CEDRXS: &lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;</b><br/> <b>[&lt;CR&gt;&lt;LF&gt;+CEDRXS: &lt;AcT-type&gt;,&lt;Requested_eDRX_value&gt;</b><br/> <b>[...]]]</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+CEDRXS=[<mode>],[<AcT-type>],[<Requested_eDRX_value>]] | <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;mode&gt;</b> Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of &lt;mode&gt; will take effect for all specified values of &lt;AcT&gt;.</p> <ul style="list-style-type: none"> <li>0 Disable the use of eDRX</li> <li>1 Enable the use of eDRX</li> <li>2 Enable the use of eDRX and enable the unsolicited result code</li> </ul> <p><b>+CEDRXP:</b> &lt;AcT-type&gt;,[&lt;Requested_eDRX_value&gt;],[&lt;NW-provided_eDRX_value&gt;],[&lt;Paging_time_window&gt;]]</p> <ul style="list-style-type: none"> <li>3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</li> </ul> <p><b>&lt;AcT-type&gt;</b> Integer type, indicates the type of access technology. This</p> |

|                                     |  |
|-------------------------------------|--|
|                                     | <p>AT- command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>5 E-UTRAN (NB-S1 mode)</p> <p>&lt;<b>Requested_eDRX_value</b>&gt; String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.</p> <p>&lt;<b>NW-provided_eDRX_value</b>&gt; String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p> <p>&lt;<b>Paging_time_window</b>&gt; String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p> |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference<br>3GPP TS 27.007<br>[13] | Note   |

### 3.2.32 AT+CEDRXRDP eDRX Read Dynamic Parameters

| AT+CEDRXRDP eDRX Read Dynamic Parameters  |  |
|---|--|
| Test Command<br><b>AT+CEDRXRDP=?</b>      | <p>Response<br/><b>OK</b></p> <p>Parameters<br/>See Execution Command</p>  |
| Execution Command<br><b>AT+CEDRXRDP P</b> | <p>Response<br/><b>+CEDRXRDP:</b><br/> <b>&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;[,&lt;NW-provided_eDRX_value&gt;[,&lt;Paging_time_window&gt;]]]</b></p> <p><b>OK</b></p> <p>If error is related to ME functionality:</p> |

|                                  |  |
|----------------------------------|--|
|                                  | <b>+CME ERROR: &lt;err&gt;</b><br>Parameters<br><b>&lt;AcT-type&gt;</b> Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.<br>0 Access technology is not using eDRX<br>4 E-UTRAN (NB-S1 mode)<br><b>&lt;Requested_eDRX_value&gt;</b> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.<br><b>&lt;NW-provided_eDRX_value&gt;</b> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.<br><b>&lt;Paging_time_window&gt;</b> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. |
| Parameter Saving Mode            | NO_SAVE  |
| Max Response Time                | -  |
| Reference<br>3GPP TS 27.007 [13] | Note   |

### 3.2.33 AT+CCHO Open UICC Logical Channel

| AT+CCHO Open UICC Logical Channel               |  |
|---|--|
| Write Command<br><b>AT+CCHO=&lt;df name&gt;</b> | Response<br><b>+CCHO: &lt;sessionid&gt;</b><br><br><b>OK</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Parameters   |

|                                     |   |
|-------------------------------------|---|
|                                     | <p><b>&lt;dfname&gt;</b> String type in hexadecimal character format. All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes</p> <p><b>&lt;sessionid&gt;</b> Integer type; a session Id to be used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism</p> |
| Parameter Saving Mode               | NO_SAVE   |
| Max Response Time                   | -   |
| Reference<br>3GPP TS 27.007<br>[13] | Note  |

### 3.2.34 AT+CCHC Close UICC logical channel

| AT+CCHC Close UICC Logical Channel   |   |
|--------------------------------------|---|
| Write Command<br>AT+CCHC=<sessionid> | <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;sessionid&gt;</b> Integer type; the session used to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism</p> |
| Parameter Saving Mode                | NO_SAVE   |
| Max Response Time                    | -   |
| Reference<br>3GPP TS 27.007<br>[13]  | Note  |

### 3.2.35 AT+CGLA Generic UICC Logical Channel Access

| AT+CGLA Generic UICC Logical Channel Access             |  |
|---|--|
| Write Command<br>AT+CGLA=<sessionid>,<length>,<command> | <p>Response</p> <p><b>+CGLA: &lt;length&gt;,&lt;response&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;sessionid&gt;</b> Integer type; this is the identifier of the session used to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").</p> <p><b>&lt;length&gt;</b> Integer type; length of the characters that are sent to TE in <b>&lt;command&gt;</b> or <b>&lt;response&gt;</b> (two times the actual length of the command or response)</p> <p><b>&lt;command&gt;</b> Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format)</p> <p><b>&lt;response&gt;</b> Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 (hexadecimal character format)</p> |
| Parameter Saving Mode               | NO_SAVE   |
| Max Response Time                   | -   |
| Reference<br>3GPP TS 27.007<br>[13] | Note  |

### 3.2.36 AT+CPINR Remaining PIN Retries

| AT+CPINR Remaining PIN Retries         |  |
|--|--|
| Test Command<br>AT+CPINR=?             | <p>Response<br/><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT+CPINR[=<sel_code>] | <p>Response<br/>[+CPINR: &lt;code&gt;,&lt;retries&gt;,&lt;default_retries&gt;]<br/>[&lt;CR&gt;,&lt;LF&gt;+CPINR: &lt;code&gt;,&lt;retries&gt;,&lt;default_retries&gt;]</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;sel_code&gt;</b> String type. Same values as for the &lt;code&gt; parameter. These values are strings and shall be indicated within double quotes. Wildcard match by '*', meaning match any (sub-)string, or '?' meaning an character can be used.</p> <p><b>&lt;retries&gt;</b> Integer type. Number of remaining retries per PIN.</p> <p><b>&lt;default_retries&gt;</b> Integer type. Number of default/initial retries per PIN.</p> <p><b>&lt;code&gt;</b> Type of PIN. All values listed under the description of the</p> |

|                                     |   |
|-------------------------------------|---|
|                                     | AT+CPIN Command, <code> parameter except "READY". |
| Parameter Saving Mode               | NO_SAVE   |
| Max Response Time                   | -   |
| Reference<br>3GPP TS 27.007<br>[13] | Note  |

### 3.2.37 AT+CGATT GPRS/Packet Domain Attach or Detach

| AT+CGATT GPRS/Packet Domain Attach or Detach |   |
|--|---|
| Test Command<br>AT+CGATT=?                   | <p>Response</p> <p><b>+CGATT:</b> (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><b>+CGATT:</b> &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><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;state&gt;            Indicates the state of GPRS/Packet Domain attachment</p> <p>0   Detached</p> <p>1   Attached</p> <p>Other values are reserved and will result in an ERROR response to the Write Command.</p> |
| Parameter Saving Mode                        | NO_SAVE   |
| Max Response Time                            | -   |
| Reference                                    | Note  |

### 3.2.38 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 supported &lt;IPv4AddrAlloc&gt;s),(list of supported &lt;request_type&gt;s),(list of supported &lt;P-CSCF_discovery&gt;s),(list of supported &lt;IM_CN_Signalling_Flag_Ind&gt;s),(list of supported &lt;NSLPI&gt;s),(list of supported &lt;securePCO&gt;s),(list of supported &lt;IPv4_MTU_discovery&gt;s),(list of supported &lt;Local_Addr_Ind&gt;s),(list of supported &lt;Non-IPMTUdiscovery&gt;s)</p> <p>[&lt;CR&gt;&lt;LF&gt;+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 supported &lt;IPv4AddrAlloc&gt;s),(list of supported &lt;request_type&gt;s),(list of supported &lt;P-CSCF_discovery&gt;s),(list of supported &lt;IM_CN_Signalling_Flag_Ind&gt;s),(list of supported &lt;NSLPI&gt;s),(list of supported &lt;securePCO&gt;s),(list of supported &lt;IPv4_MTU_discovery&gt;s),(list of supported &lt;Local_Addr_Ind&gt;s),(list of supported &lt;Non-IP_MTU_discovery&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;IPv4AddrAlloc&gt;[,&lt;request_type&gt;[,&lt;P-CSCF_discovery&gt;[,&lt;IM_CN_Signalling_Flag_Ind&gt;[,&lt;NSLPI&gt;[,&lt;securePCO&gt;[,&lt;IPv4_MTU_discovery&gt;[,&lt;Local_Addr_Ind&gt;[,&lt;Non-IP_MTU_discovery&gt;]]]]]]]]]</p> <p>[&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;IPv4AddrAlloc&gt;[,&lt;request_type&gt;[,&lt;P-CSCF_discovery&gt;[,&lt;IM_CN_Signalling_Flag_Ind&gt;[,&lt;NSLPI&gt;[,&lt;securePCO&gt;[,&lt;IPv4_MTU_discovery&gt;[,&lt;Local_Addr_Ind&gt;[,&lt;Non-IP_MTU_discovery&gt;]]]]]]]]]</p> <p>OK</p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT+CGDCONT=<cid>[,<PDP_ty | <p>Response</p> <p>OK</p> <p>or</p>  |

| pe>[,APN>[,<PD                           | ERROR  |
|--|--|
| P_addr>[,<d_co<br>mp>[,<h_comp>]<br>]]]] | <p>Parameters</p> <p><b>&lt;cid&gt;</b> (PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition.</p> <p>The parameter is local to the UE-TE interface and is used in other PDP context-related commands.</p> <p>The range of permitted values (minimum value=1 or if the initial PDP context is supported minimum value=0) is returned by the test form of the command.</p> <p><b>&lt;PDP_type&gt;</b> (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol :</p> <ul style="list-style-type: none"> <li>IP            Internet Protocol (IETF STD 5)</li> <li>IPV6        Internet Protocol, version 6 (IETF RFC 2460)</li> <li>IPV4V6     Virtual &lt;PDP_type&gt;) introduced to handle dual IP stack UE capability (see 3GPP Technical Specifications 24.301).</li> <li>Non-IP      Transfer of Non-IP data to external packet data Network (see 3GPP Technical Specifications 24.301).</li> </ul> <p><b>&lt;APN&gt;</b> (Access Point Name) a string parameter, a logical name to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.</p> <p><b>&lt;PDP_addr&gt;</b> A string parameter that identifies the UE in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.</p> <p>NOTE: For EPS, this field is omitted.</p> <p><b>&lt;d_comp&gt;</b> A numeric parameter that controls PDP data compression (applicable for SNDTCP only) (refer 3GPP TS 04.65)</p> <ul style="list-style-type: none"> <li>0    off (default if value is omitted)</li> <li>1    on (manufacturer preferred compression)</li> <li>2    V.42bis</li> </ul> <p>Other values are reserved.</p> <p><b>&lt;h_comp&gt;</b> A numeric parameter that controls PDP header compression (refer 3GPP TS 04.65)</p> <ul style="list-style-type: none"> <li>0    off (default if value is omitted)</li> <li>1    on (manufacturer preferred compression)</li> <li>2    RFC1144 (applicable for SNDTCP only)</li> <li>3    RFC 2507</li> <li>4    RFC 3095 (ROHC) (applicable for PDCP only)</li> </ul> <p>Other values are reserved.</p> <p><b>&lt;IPv4_MTU_discovery&gt;</b> Integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 sub-clause</p> |



|                       |   |
|-----------------------|---|
|                       | <p>10.5.6.3.</p> <p>0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT</p> <p>1 Preference of IPv4 MTU size discovery through NAS signaling<br/> <b>&lt;Non-IP_MTU_discovery&gt;</b> Integer type; influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 sub-clause 10.5.6.3.</p> <p>0 Preference of Non-IP MTU size discovery not influenced by +CGDCONT</p> <p>1 Preference of Non-IP MTU size discovery through NAS signaling</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

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

| AT+CGACT PDP Context Activate or Deactivate |   |
|---|---|
| Test Command<br>AT+CGACT=?                  | <p>Response</p> <p>+CGACT: (list of supported &lt;state&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br>AT+CGACT?                   | <p>Response</p> <p>+CGACT: &lt;cid&gt;,&lt;state&gt;[&lt;CR&gt;&lt;LF&gt;+CGACT: &lt;cid&gt;,&lt;state&gt;...]</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT+CGACT=<state>[,<cid>]   | <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;state&gt;</b> Indicates the state of PDP context activation</p> <p>0 Deactivated</p> <p>1 Activated</p> <p>Other values are reserved and will result in an ERROR response to the Write Command.</p> <p><b>&lt;cid&gt;</b> A numeric parameter which specifies a particular PDP context</p> |

|                       |  |
|-----------------------|--|
|                       | definition (see +CGDCONT Command). If the <cid> is omitted, it only affects the first cid.   |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | 150 seconds  |
| Reference             | Note<br>If context is deactivated successfully, NO CARRIER is returned<br>If <cid>=0 for PDN activated during attach is enabled, then AT+CGACT=<0 or 1>,0 will cause ERROR response. |

### 3.2.40 AT+CGPADDR Show PDP Address

| AT+CGPADDR Show PDP Address                                      |   |
|--|---|
| Test Command<br><b>AT+CGPADDR=?</b>                              | Response<br><b>+CGPADDR: (list of defined &lt;cid&gt;s)</b><br><br><b>OK</b><br>or<br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGPADDR=[&lt;cid&gt;,&lt;cid&gt;,...]</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>or<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). If no <cid> is specified, the addresses for all defined contexts are returned.<br><b>&lt;PDP_addr&gt;</b> A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic.<br>For a static address, it will be the one set by the +CGDCONT command when the context was defined.<br>For a dynamic address, it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>.<br><b>&lt;PDP_address&gt;</b> is omitted if none is available. |
| Parameter Saving   | NO_SAVE   |

|                   |   |
|-------------------|---|
| Mode              |   |
| Max Response Time | -   |
| Reference         | Note<br>Write command returns address provided by the network if a connection has been established. |

### 3.2.41 AT+IPCONFIG Show the Complete PDP Address

| AT+IPCONFIG Show the Complete PDP Address |  |
|---|--|
| Execution Command<br><b>AT+IPCONFIG</b>   | Response<br><b>+IPCONFIG: &lt;PDP_addr&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;PDP_addr&gt;</b> A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic.<br>For a static address, it will be the one set by the +CGDCONT command when the context was defined. |
| Parameter Saving Mode                     | NO_SAVE  |
| Max Response Time                         | -  |
| Reference                                 | Note<br>Write command returns address provided by the network if a connection has been established.  |

### 3.2.42 AT+CGEREP Packet Domain Event Reporting

| AT+CGEREP Packet Domain Event Reporting |  |
|---|--|
| Test Command<br><b>AT+CGEREP=?</b>      | Response<br><b>+CGEREP: (list of supported &lt;mode&gt;s),(list of supported &lt;bfr&gt;s)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CGEREP?</b>       | Response<br><b>+CGEREP: &lt;mode&gt;,&lt;bfr&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command                           | Response   |

|                                      |   |
|--------------------------------------|---|
| <p><b>AT+CGEREP=&lt;mode&gt;</b></p> | <p><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b></p> <ul style="list-style-type: none"> <li>0 buffer unsolicited result codes in the UE; if UE result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.</li> <li>1 discard unsolicited result codes when UE-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE</li> <li>2 buffer unsolicited result codes in the UE when UE-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when UE-TE link becomes available; otherwise forward them directly to the TE</li> </ul> <p><b>&lt;bfr&gt;</b></p> <ul style="list-style-type: none"> <li>0 UE buffer of unsolicited result codes defined within this command is cleared when &lt;mode&gt; 1 or 2 is entered</li> <li>1 UE buffer of unsolicited result codes defined within this command is flushed to the TE when &lt;mode&gt; 1 or 2 is entered (OK response shall be given before flushing the codes)</li> </ul>  |
|                                      | <p>Unsolicited Result Codes supported:</p> <p><b>For network attachment, the following unsolicited result codes and the corresponding events are defined:</b></p> <p><b>+CGEV: NW DETACH</b><br/>The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.</p> <p><b>+CGEV: ME DETACH</b><br/>The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.</p> <p><b>For PDP context activation, the following unsolicited result codes and the corresponding events are defined:</b></p> <p><b>+CGEV: NW PDN ACT &lt;cid&gt;</b><br/>The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The &lt;cid&gt; for this context is provided to the TE. The format of the parameter &lt;cid&gt; is found in command +CGDCONT.<br/>NOTE 1: This event is not applicable for EPS.</p> <p><b>+CGEV: ME PDN ACT &lt;cid&gt;[,&lt;reason&gt;[,&lt;cid_other&gt;]]</b><br/>The mobile termination has activated a context. The context represents a PDN connection in NB-IOT. The &lt;cid&gt; for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameter &lt;cid&gt; and &lt;cid other&gt; are found in command +CGDCONT.</p> |

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

**+CGEV: NW PDN DEACT <cid>**

The network has deactivated a context. The context represents a PDN connection in NB-IOT. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 2: Occurrence of this event replaces usage of the event

**+CGEV: NW DEACT <PDP\_type>,<PDP\_addr>, [<cid>]**

**+CGEV: ME PDN DEACT <cid>**

The mobile termination has deactivated a context. The context represents a PDN connection in NB-IOT. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE 3: Occurrence of this event replaces usage of the event **+CGEV: ME DEACT <PDP\_type>,<PDP\_addr>, [<cid>]**

**For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:**

**+CGEV: REJECT <PDP\_type>,<PDP\_addr>**

A network request for context activation occurred when the UE was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP\_type> and <PDP\_addr> are found in command +CGDCONT.

NOTE 6: This event is not applicable for EPS.

**+CGEV: NW REACT <PDP\_type>,<PDP\_addr>, [<cid>]**

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the UE. The format of the parameters <PDP\_type>,<PDP\_addr> and <cid> are found in command +CGDCONT.

NOTE 7: This event is not applicable for EPS.

Parameters

**<PDP\_addr>** Packet Data Protocol address (see +CGDCONT command)

**<cid>** Context Id (see +CGDCONT command)

Note: <cid> only given if known to the UE.

**<class>** GPRS mobile class (see +CGCLASS command)

**<event\_type>** Integer type parameter indicates whether this is an informational event of whether the TE as acknowledged it.

0 Informational event

1 Information request: Acknowledgement required. The Acknowledgement can be accept or reject, see AT+CGANS.

**<change\_reason>** Integer type parameter indicates what kind of change occurred.

1 TFT only changed

2 QoS only changed

|                       |   |
|-----------------------|---|
|                       | <p>3 Both TFT and QoS changed</p> <p><b>&lt;reason&gt;</b> Integer type parameter indicates the reason why the context activation request for PDP type IPV4V6 was not granted. This parameter is only included if the requested PDP type associated with &lt;cid&gt; is IPV4V6, and the PDP type assign by the network for &lt;cid&gt; is either IPV4 or IPV6</p> <p>0 IPV4 only allowed</p> <p>1 IPV6 only allowed</p> <p>2 single address bearers only allowed</p> <p>3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful</p> <p><b>&lt;cid_other&gt;</b> Indicated the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if &lt;reason&gt; parameter indicates single address bearers only allowed, and MT support MT initiated context activation of a second address type without additional commands from the TE, and MT has activated the PDN connection or PDP context associated with &lt;cid_other&gt;.</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

### 3.2.43 AT+CGREG Network Registration Status

| AT+CGREG Network Registration Status |   |
|--------------------------------------|---|
| Test Command<br>AT+CGREG=?           | <p>Response</p> <p>+CGREG: (list of supported &lt;n&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+CGREG?            | <p>Response</p> <p>+CGREG: &lt;n&gt;,&lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;AcT&gt;,&lt;rac&gt;]</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>See Write Command</p> |
| Write Command<br>AT+CGREG=<n><br>>   | <p>Response</p> <p><b>OK</b></p> <p>or</p>  |

|  |      |
|--|------|
| <b>ERROR</b>   |      |
| Parameters   |      |
| <p><b>&lt;n&gt;</b></p> <ul style="list-style-type: none"> <li>0 Disable network registration unsolicited result code</li> <li>1 Enable network registration unsolicited result code</li> </ul> <p><b>+CGREG: &lt;stat&gt;</b></p> <ul style="list-style-type: none"> <li>2 Enable network registration and location information unsolicited result code <b>+CGREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;,&lt;AcT&gt;,&lt;rac&gt;]</b></li> </ul> <p><b>&lt;stat&gt;</b></p> <ul style="list-style-type: none"> <li>0 Not registered, MT is not currently searching an operator to register to.</li> <li>1 Registered, home network.</li> <li>2 Not registered, but MT is currently trying to attach or searching an operator to register to.</li> <li>3 Registration denied.</li> <li>4 Unknown</li> <li>5 Registered, roaming</li> <li>6 Registered for "SMS only", home network (applicable only when &lt;AcT&gt; indicates E-UTRAN</li> <li>7 Registered for "SMS only", roaming (applicable only when &lt;AcT&gt; indicates E-UTRAN</li> </ul> <p><b>&lt;lac&gt;</b> String type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)</p> <p><b>&lt;ci&gt;</b> String type; four byte UTRAN/GERAN/E-UTRAN cell ID in hexadecimal format</p> <p><b>&lt;AcT&gt;</b> Access technology of the registered network</p> <ul style="list-style-type: none"> <li>9 NB-IoT</li> </ul> <p><b>&lt;rac&gt;</b> String type; one byte routing area code in hexadecimal format</p> |      |
| Parameter Saving Mode  | -    |
| Max Response Time  | -    |
| Reference  | Note |

### 3.2.44 AT+CGCONTRDP PDP Context Read Dynamic Parameters

| AT+CGCONTRDP PDP Context Read Dynamic Parameters |   |
|--|---|
| Test Command                                     | Response  |
| <b>AT+CGCONTRDP=?</b>                            | <p><b>+CGCONTRDP:</b> (list of &lt;cid&gt;s associated with active contexts)</p> <p><b>OK</b></p> <p>or</p> |

|   |  |
|---|--|
|   | <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| <p>Write Command</p> <p><b>AT+CGCONTRDP=[&lt;cid&gt;]</b></p> | <p>Response</p> <p><b>+CGCONTRDP: &lt;cid&gt;,&lt;bearer_id&gt;,&lt;apn&gt;[,&lt;local address and subnet mask&gt;[,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt;[,&lt;DNS_sec_addr&gt;[,&lt;Serving_PLMN_rate_control_value&gt;]]]]]</b></p> <p><b>[&lt;CR&gt;&lt;LF&gt;+CGCONTRDP: &lt;cid&gt;,&lt;bearer_id&gt;,&lt;apn&gt;[,&lt;local address and subnet mask&gt;[,&lt;gw_addr&gt;[,&lt;DNS_prim_addr&gt;[,&lt;DNS_sec_addr&gt;[,&lt;Serving_PLMN_rate_control_value&gt;]]]]]</b></p> <p><b>[...]</b></p> <p><b>OK</b></p> <p>or</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> A numeric parameter which specifies a particular primary PDP context definition. The parameter is local to the TE-UE interface and is used in other PDP context-related commands.</p> <p><b>&lt;bearer_id&gt;</b> A numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.</p> <p><b>&lt;APN&gt;</b> A string parameter which is a logical name that was used to select the GGSN or the external packet data network.</p> <p><b>&lt;local address and subnet mask&gt;</b></p> <p>A string parameter which shows the IP Address and subnet mask of the UE. The string is given as dot-separated numeric (0-255) parameters on the form:</p> <p>"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or</p> <p>"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.</p> <p><b>&lt;gw_addr&gt;</b> A string parameter which shows the Gateway Address of the UE. The string is given as dot-separated numeric (0-255) parameters.</p> <p><b>&lt;DNS_prim_addr&gt;</b> A string parameter which shows the IP Address of the primary DNS Server.</p> <p><b>&lt;DNS_sec_addr&gt;</b> A string parameter which shows the IP address of the secondary DNS Server.</p> <p><b>&lt;Serving_PLMN_rate_control_value&gt;</b> Integer type; indicates the maximum number of uplink messages the UE is allowed to send in a 6-minute interval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in 3GPP TS 24.301 sub-clause 9.9.4.28.</p> |
| <p>Parameter Saving</p>                                       | <p>-</p>   |



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

### 3.2.45 AT+CGPIAF Printing IP Address Format

| AT+CGPIAF Printing IP Address Format  |   |
|---|---|
| Test Command<br><b>AT+CGPIAF=?</b>  | <p>Response</p> <p><b>+CGPIAF:</b> (list of supported &lt;IPv6_AddressFormat&gt;s),(list of supported &lt;IPv6_SubnetNotation&gt;s),(list of supported &lt;IPv6_LeadingZeros&gt;s), (list of supported &lt;IPv6_CompressZeros&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br><b>AT+CGPIAF?</b>   | <p>Response</p> <p><b>+CGPIAF:</b><br/>&lt;IPv6_AddressFormat&gt;,&lt;IPv6_SubnetNotation&gt;,&lt;IPv6_LeadingZeros&gt;,&lt;IPv6_CompressZeros&gt;</p> <p><b>OK</b><br/>or<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br><b>AT+CGPIAF=[IPv6_AddressFormat],[IPv6_SubnetNotation],[IPv6_LeadingZeros],[IPv6_CompressZeros]</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;IPv6_AddressFormat&gt;</b> Integer type, decides the IPV6 address format. Relevant for all AT command parameters that can hold an IPV6 address.</p> <p>0 Use IPV4-like dot-notation. IP address, and Subnetwork mask if applicable, are dot-separated.<br/>Example:<br/>For &lt;source address and subnet mask&gt;:<br/>"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0.255.255.255.255.255.240.0.0.0.0.0.0.0"<br/>For other IP address parameters:<br/>"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0"</p> <p>1 Use IPV6-like colon notation. IP address, and subnetwork mask</p> |

|                       |   |
|-----------------------|---|
|                       | <p>if applicable and when given explicitly, are separated by a space.</p> <p>Example:</p> <p>For &lt;source address and subnet mask&gt;:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF: FFFF:FFFF:FFF0:0000:0000:0000:0000"</p> <p>For other IP address parameters:</p> <p>"2001:0DB8:0000:CD80:0000:0000:0000:0000"</p> <p><b>&lt;IPv6_SubnetNotation&gt;</b> Integer type, decides the subnet-notation for &lt;source Address and subnet mask&gt;. Setting does not apply If &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 Both IP Address and subnet mask are stated. Explicitly, separated by a space.</p> <p>Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF: FFFF:FFFF:FFF0:0000:0000:0000:0000"</p> <p>1 The printout format is applying / (forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation:</p> <p>Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000/60"</p> <p><b>&lt;IPv6_LeadingZeros&gt;</b> Integer type, decides whether leading zeros are Omitted or not. Setting does not apply if &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 Leading zeros are omitted.</p> <p>Example:</p> <p>"2001:DB8:0:CD30:0:0:0:0"</p> <p>1 Leading zeros are included.</p> <p>Example:</p> <p>"2001:0DB8:0000:CD30:0000:0000:0000:0000"</p> <p><b>&lt;IPv6_CompressZeros&gt;</b> Integer type, decides whether 1-n instances of 16 bit zero-values are replaced by only "..". This applies only once. Setting does not apply if &lt;IPv6_AddressFormat&gt;=0.</p> <p>0 No zero compression.</p> <p>Example: "2001:DB8:0:CD30:0:0:0:0"</p> <p>1 Use zero compression.</p> <p>Example: "2001:DB8:0:CD30::"</p> |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | Note  |

### 3.2.46 AT+CGDEL Delete Non-Active PDP Contexts

#### AT+CGDEL Delete Non-Active PDP Contexts

|  |  |
|--|--|
| Test Command<br><b>AT+CGDEL=?</b>              | Response<br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CGDEL=[&lt;cid&gt;]</b> | Response<br><b>+CGDEL: &lt;cid&gt;[,&lt;cid&gt;[,...]]</b><br><br><b>OK</b><br>If error is related to wrong AT syntax:<br><b>+CME ERROR: &lt;err&gt;</b> |
|  | Parameters<br><b>&lt;cid&gt;</b> A numeric parameter which specifies a particular PDP context Definition.  |
|  |  |
| Parameter Saving Mode                          | -  |
| Max Response Time                              | -  |
| Reference                                      | Note   |

### 3.2.47 AT+CGAUTH Define PDP Context Authentication Parameters

| <b>AT+CGAUTH Define PDP Context Authentication Parameters</b>                          |   |
|--|---|
| Test Command<br><b>AT+CGAUTH=?</b>   | Response<br><b>+CGAUTH: (range of supported &lt;cid&gt;s),(list of supported &lt;auth_prot&gt;s),(range of supported &lt;userid&gt;s),(range of supported &lt;password&gt;s)</b><br><br><b>OK</b>                         |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CGAUTH?</b>  | Response<br><b>[+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;userid&gt;,&lt;password&gt;]</b><br><b>[&lt;CR&gt;&lt;LF&gt;+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;userid&gt;,&lt;password&gt; [...]]</b><br><br><b>OK</b> |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGAUTH=&lt;cid&gt;[,&lt;auth_prot&gt;[,&lt;userid&gt;[,&lt;</b> | Response<br>When <auth_prot>/<username>/<password> set:<br><b>OK</b><br>When no <auth_prot>/<username>/<password> set displays current  |
|  |   |

|                       |  |
|-----------------------|--|
| password>]]]          | <p>auth_prot username and password for &lt;cid&gt;:<br/> <b>+CGAUTH: &lt;cid&gt;,&lt;auth_prot&gt;,&lt;username&gt;,&lt;password&gt;</b><br/> <b>OK</b></p> <p>If error is related to wrong AT syntax:<br/> <b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;cid&gt;</b> A numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).</p> <p><b>&lt;auth_prot&gt;</b> Numeric parameter. Authentication protocol used for this PDP context.</p> <p>0 None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified.</p> <p>1 PAP</p> <p><b>&lt;userid&gt;</b> String type. User name for access to the IP network.</p> <p><b>&lt;password&gt;</b> String type. Password for access to the IP network.</p> |
| Parameter Saving Mode | -  |
| Max Response Time     | -  |
| Reference             | Note   |

### 3.2.48 AT\*MCGDEFCONT Set Default PSD Connection Settings

| AT*MCGDEFCONT Set Default PSD Connection Settings                           |   |
|---|---|
| Test Command<br>AT*MCGDEFCONT=?   | <p>Response</p> <p><b>*MCGDEFCONT: (list of supported &lt;PDP_type&gt;)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT*MCGDEFCONT?  | <p>Response</p> <p><b>*MCGDEFCONT: &lt;PDP_type&gt;[,&lt;APN&gt;,&lt;username&gt;,&lt;password&gt;]</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT*MCGDEFCONT=<PDP_type>[,<APN>[,<username>[,<password>]]] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/> <b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;PDP_type&gt;</b> (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>IPV6    Internet Protocol, version 6 (IETF RFC 2460)</p> <p>IPV4V6    Virtual &lt;PDP_type&gt; introduced to handle dual IP stack UE capability(see 3GPP TS 24.301).</p> <p>Non-IP    Transfer of Non-IP data to external packet data Network (see 3GPP TS 24.301).</p> <p>&lt;APN&gt;    (Access Point Name) a string parameter that 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.</p> <p>&lt;username&gt;    String value. Username for the connection to the service provider.</p> <p>&lt;password&gt;    String value. Password for the connection to the service provider</p> |
| Parameter Saving Mode | AUTO_SAVE_REBOOT   |
| Max Response Time     | -  |
| Reference             | Note   |

### 3.2.49 AT\*MSACL Enable/Disable ACL feature

| AT*MSACL Enable/Disable ACL feature        |   |
|--|---|
| Test Command<br>AT*MSACL=?                 | <p>Response</p> <p>*MSACL: (0-1)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br>AT*MSACL?                  | <p>Response</p> <p>*MSACL: &lt;supported&gt;&lt;enabled&gt;</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT*MSACL=<mode>, [<PIN2>] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;mode&gt; Action selected</p> <p>0    ACL to be disabled</p> <p>1    ACL to be enabled</p> |

|                       |   |
|-----------------------|---|
|                       | <p><b>&lt;supported&gt;</b></p> <p>0 ACL not supported by SIM</p> <p>1 ACL supported by SIM</p> <p><b>&lt;enabled&gt;</b></p> <p>0 ACL disabled by user</p> <p>1 ACL enabled by user</p> <p><b>&lt;PIN2&gt;</b></p>   |
| Parameter Saving Mode | -   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <p>Enables/disables ACL feature for the mobile unit. If enabled and supported by the SIM, PDP Activations are only possible with APNs which are present in the ACL list.</p> <p>If PIN2 is not confirmed before the command is issued, the PIN2 should be supplied as a second parameter.</p> |

### 3.2.50 AT\*MLACL Display ACL List

| AT*MSACL Display ACL List                                   |  |
|---|--|
| Test Command<br><b>AT*MLACL=?</b>                           | <p>Response</p> <p><b>*MLACL: (0-255),(0-255)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT*MLACL=&lt;from&gt;, [&lt;to&gt;]</b> | <p>Response</p> <p><b>*MLACL: &lt;index&gt;,&lt;APN&gt;</b></p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;from&gt;</b> Start index</p> <p><b>&lt;to&gt;</b> End index</p> <p><b>&lt;index&gt;</b> Entry index</p> <p><b>&lt;APN&gt;</b> APN in textual format</p> |
| Parameter Saving Mode                                       | -  |
| Max Response Time   | -  |
| Reference   | Note   |

Only applies to USIM (3G).

### 3.2.51 AT\*MWACL Write an ACL entry

| AT*MWACL  | Write an ACL entry   |
|---|--|
| Test Command<br>AT*MWACL=?                          | <p>Response</p> <p><b>*MWACL: (0-255)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT*MWACL=<i<br>ndex>,<APN>,<PIN2>] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>           &lt;index&gt; Entry index<br/>           &lt;APN&gt; APN in textual format<br/>           &lt;PIN2&gt; Personal Identification Number 2         </p> |
| Parameter Saving Mode                               | -  |
| Max Response Time                                   | -  |
| Reference   | <p>Note</p> <p>Only applies to USIM (3G).</p>  |

### 3.2.52 AT\*MDACL Delete an ACL entry

| AT*MDACL  | Delete an ACL entry  |
|---|--|
| Test Command<br>AT*MDACL=?                      | <p>Response</p> <p><b>*MDACL: (0-255)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Write Command<br>AT*MDACL=<i<br>ndex>, [<PIN2>] | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>           &lt;index&gt; Entry index<br/>           &lt;PIN2&gt;         </p> |
| Parameter Saving                                | -  |

|                   |  |
|-------------------|--|
| Mode              |  |
| Max Response Time | -  |
| Reference         | <p>Note</p> <p>Deletes an ACL entry from the specific index in the list. The entry will be deleted, and all the following entries moved to the previous index to cover the deleted entry, leaving the continuous list. If PIN2 is not confirmed before the command is issued, PIN2 should be supplied as a second parameter.</p> |

### 3.2.53 AT+CNBIOTDT NB-IOT Data Type

| AT+CNBIOTDT NB-IOT Data Type   |   |
|--|---|
| Test Command<br><b>AT+CNBIOTDT=?</b>   | <p>Response</p> <p><b>+CNBIOTDT: (list of supported &lt;type&gt;s)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CNBIOTDT?</b>  | <p>Response</p> <p>Displays &lt;type&gt; for all active PDP contexts:</p> <p><b>[+CNBIOTDT: &lt;cid&gt;,&lt;type&gt;]</b><br/> <b>[&lt;CR&gt;&lt;LF&gt;+CNBIOTDT: &lt;cid&gt;,&lt;type&gt;]</b><br/> <b>[...]</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CNBIOTDT=&lt;type&gt;[,&lt;cid&gt;[,&lt;cid&gt;[,...]]]</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax:<br/><b>+CME ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;type&gt;</b> Integer type<br/> 0 Normal data (default)<br/> 1 Exceptional data</p> <p><b>&lt;cid&gt;</b> Integer type. Specifies a particular PDP context definition.<br/> If no &lt;cid&gt;s are specified the command sets &lt;type&gt; for all active PDP contexts.</p> |
| Parameter Saving Mode  | -   |
| Max Response Time  | -   |



|           |   |
|-----------|---|
| Reference | Note<br>The UE will not remember this setting over sleep cycles (i.e. the UE will fall back to default setting after sleep) |
|-----------|---|

### 3.2.54 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><br><br>Parameters<br>See Execution Command  |
| Read Command<br><b>AT+CEREG?</b>                 | Response<br>when <n>=0, 1, 2 or 3 and command successful:<br><b>+CEREG:</b> <n>,<stat>[,<tac>],[<ci>],[<AcT>],[<rac>],[<cause_type>,<reject_cause>]]]<br>when <n>=4 or 5 and command successful:<br><b>+CEREG:</b> <n>,<stat>[,<tac>],[<ci>],[<AcT>],[<rac>],[<cause_type>],[<reject_cause>],[<Active-Time>],[<Periodic-TAU>]]]<br>If error is related to wrong AT syntax or operation not allowed:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br>See Execution Command   |
| Execution Command<br><b>AT+CEREG[=&lt;n&gt;]</b> | Response<br><b>OK</b><br>If error is related to wrong AT syntax:<br><b>+CME ERROR: &lt;err&gt;</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>+CEREG: &lt;stat&gt;</b></li> <li>2 Enable network registration and location information unsolicited result code <b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;],[&lt;rac&gt;]]</b></li> <li>3 Enable network registration, location information and EMM cause value information unsolicited result code<br/><b>+CEREG: &lt;stat&gt;[,&lt;tac&gt;],[&lt;ci&gt;],[&lt;AcT&gt;],[&lt;rac&gt;],[&lt;cause_type&gt;,&lt;reject_cause&gt;]]</b></li> <li>4 For a UE that wants to apply PSM, enable network registration</li> </ul> |

and location information unsolicited result code

**+CEREG: <stat>[,<tac>[,<ci>[,<AcT>[,<rac>][,],[<Active-Time>],<Periodic-RAU>],<GPRS-READY-timer>]]]]**

5 For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code

**+CEREG: <stat>[,<tac>[,<ci>[,<AcT>[,<rac>][,],[<cause\_type>],<reject\_cause>][,],[<Active-Time>],<Periodic-RAU>],<GPRS-READY-timer>]]]]**

**<stat>** EPS registration status

0 Not registered, ME is not currently searching a new operator to register to

1 Registered, home network

2 Not registered, but ME is currently searching for a new operator to register to

3 Registration denied

4 Unknown

5 Registered, roaming

6 Registered for "SMS only", home network (applicable only when <AcT> indicates NB-IOT

7 Registered for "SMS only", roaming (applicable only when <AcT> indicates NB-IOT

**<tac>** String type; two byte tracking area code in

Hexadecimal format (e.g. "00C3" equals 195 in decimal).

**<ci>** String type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format

**<AcT>** Access technology of the registered network

9 NB-IoT

**<cause\_type>** Integer type; indicates the type of <reject\_cause>

0 Indicates that <reject\_cause> contains an EMM cause value, see 3GPP TS 24.301 Annex A.

1 Indicates that <reject\_cause> contains a manufacturer-specific cause.

**<reject\_cause>** Integer type; contains the cause of the failed registration. The value is of type as defined by <cause\_type>.

**<Active-Time>** String type; one byte in an 8-bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401.

**<Periodic-TAU>** String type; one byte in an 8-bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111"

|                       |  |
|-----------------------|--|
|                       | equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008, Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 and 3GPP TS 23.401. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note<br>For NB-IoT product, only <AcT> value of 9 is valid.  |

### 3.2.55 AT+CGDATA Enter Data State

| AT+CGDATA Enter Data State   |   |
|--|---|
| Test Command<br><b>AT+CGDATA=?</b>   | Response<br><b>+CGDATA: (list of supported &lt;L2P&gt;s)</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CGDATA=[&lt;L2P&gt;[,&lt;cid&gt;[,&lt;cid&gt;[, ...]]]]</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;L2P&gt;</b> A string parameter that indicates the layer 2 protocol to be used between the TE and MT.<br>M-PT Packet Transport Mechanism protocol for a PDP such as IP<br>Other values are not supported 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). |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note<br>The command will enter data state once the PDP context has been activated<br><L2P> value M-PT is MTK proprietary and represents no <L2P> but raw IP packet transfer.  |

## 4 AT Commands Special for SIMCom

### 4.1 Overview

| Command       | Description   |
|---------------|---|
| AT+CPOWD      | Power off   |
| AT+CADC       | Read ADC  |
| AT+CLTS       | Get local timestamp                                   |
| AT+CBAND      | Get and set mobile operation band                     |
| AT+CBANDSL    | Set modem NB-IOT search prefer band list              |
| AT+CENG       | Switch on or off engineering mode                     |
| AT+CCID       | Show ICCID  |
| AT+EXUNSOL    | Enable or disable proprietary unsolicited indications |
| AT+GSV        | Display product identification information            |
| AT*CELLLOCK   | Set the list of ARFCN which needs to be locked        |
| AT+SLEDS      | Set the timer period of net light                     |
| AT+CNETLIGHT  | Close the net light or open it to shining             |
| AT+CSMINS     | SIM inserted status reporting                         |
| AT+CSPCHSC    | Set Scrambling Algorithm for NPDSCH                   |
| AT+CPSMSTATUS | Enable Deep Sleep Wakeup Indication                   |
| AT+CSCLK      | Configure Slow Clock                                  |
| AT+CRESET     | Trigger WDT Reset                                     |
| AT+CREVHEX    | Control the Data Output Format                        |
| AT+CDISAUPDN  | Control the Auto PDN Status                           |
| AT+CNWRCCFG   | Network Recovery Configure                            |
| AT+CURTC      | Control CCLK Show URC Or RTC Time                     |
| AT+CHOMENW    | Display Home Network Information                      |
| AT+CBATCHK    | Set VBAT checking feature ON/OFF                      |
| AT+CGPIO      | Control the GPIO by PIN index                         |
| AT*MEDRXCFC   | eDRX configuration                                    |

### 4.2 Detailed Descriptions of Commands

#### 4.2.1 AT+CPOWD Power Off

| AT+CPOWD Power Off |          |
|--------------------|----------|
| Write Command      | Response |

|                           |  |
|---------------------------|--|
| <b>AT+CPOWD=&lt;n&gt;</b> | <b>[NORMAL POWER DOWN]</b>   |
| >                         | Parameter<br><n><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   |

#### 4.2.2 AT+CADC Read ADC

|                                  |   |
|----------------------------------|---|
| <b>AT+CADC Read ADC</b>          |   |
| 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><br><br>Parameters<br><status> 1 Success<br>0 Fail<br><value> Integer 0-1400 |
| Read Command<br><b>AT+CADC?</b>  | Response<br><b>+CADC: &lt;status&gt;,&lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Test Command   |
| Parameter Saving Mode            | NO_SAVE   |
| Max Response Time                | 2s  |
| Reference                        | Note  |

#### 4.2.3 AT+CLTS Get Local Timestamp

**AT+CLTS Get Local Timestamp**

|  |   |
|--|---|
| Test Command<br><b>AT+CLTS=?</b>             | Response<br><b>+CLTS:</b> (list of supported <b>&lt;mode&gt;s</b> )<br><br><b>OK</b>  |
| Read Command<br><b>AT+CLTS?</b>              | Response<br><b>+CLTS:</b> <b>&lt;mode&gt;</b><br><br><b>OK</b>  |
| Write Command<br><b>AT+CLTS=&lt;mode&gt;</b> | Response<br><b>OK</b><br>If error is related to wrong AT syntax:<br><b>+CME ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;mode&gt;</b><br>0   Disable<br>1   Enable<br><br>Unsolicited Result Code<br><b>+CLTS: &lt;time&gt;</b><br><br>Parameters<br><b>&lt;time&gt;</b> String type 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. E.g 10/05/06,00:01:52+32.<br>If there is daylight saving time on the network then display:<br><b>+CLTS: 18/06/22,09:27:49+32, "DST +2 in use"</b><br>or<br><b>+CLTS: 18/06/22,09:27:49+32, "DST +1 in use"</b> . |
| Parameter Saving Mode                        | AUTO_SAVE_REBOOT  |
| Max Response Time                            | -   |
| Reference                                    | Note  |

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

| <b>AT+CBAND Get and Set Mobile Operation Band</b> |  |
|---|--|
| Test Command<br><b>AT+CBAND=?</b>                 | Response<br><b>+CBAND:</b> (list of supported <b>&lt;op_band&gt;s</b> )<br><br><b>OK</b> |
|   | Parameter<br>See Write Command   |

|  |   |
|--|---|
| Read Command<br><b>AT+CBAND?</b>                 | <p>Response</p> <p><b>+CBAND: &lt;op_band&gt;</b></p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CBAND=&lt;op_band&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>Parameter</p> <p><b>&lt;op_band&gt;</b> Integer value indicating current selected NB-IOT band<br/>Valid values: 1,2,3,5,8,11,12,13,17,18,19,20,25,26,28,31,66,70,21</p> |
| Parameter Saving Mode                            | AUTO_SAVE_REBOOT  |
| Max Response Time                                | -   |
| Reference  | Note  |

#### 4.2.5 AT+CBANDSL Set Modem NB-IOT Search Prefer Band List

| <b>AT+CBANDSL Set Modem NB-IOT Search Prefer Band List</b>   |  |
|--|--|
| Test Command<br><b>AT+CBANDSL=?</b>  | <p>Response</p> <p><b>+CBANDSL: (list of supported &lt;enable&gt;s), (list of supported &lt;band number&gt;s), (list of supported &lt;band&gt;s)</b></p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CBANDSL=&lt;enable&gt;[,&lt;band number&gt;,&lt;band1&gt;[,&lt;band2&gt;[,&lt;band3&gt;[,&lt;band4&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>Parameter</p> <p><b>&lt;enable&gt;</b> Integer value indicating search prefer band list enable or disable<br/>0 Disable<br/>1 Enable</p> <p><b>&lt;band number&gt;</b> Integer value indicating search prefer band number.<br/>Valid values: 1,2,3,4</p> <p><b>&lt;bandn&gt;</b> Integer value indicating current search prefer NB-IOT band.<br/>Valid values: 1,2,3,5,8,11,12,13,17,18,19,20,21,25,26,28,31,66,70</p> |

|                                    |  |
|------------------------------------|--|
| Read Command<br><b>AT+CBANDSL?</b> | <p>Response</p> <p><b>+CBANDSL: &lt;band&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Parameter Saving Mode              | AUTO_SAVE  |
| Max Response Time                  | -  |
| Reference                          | Note   |

#### 4.2.6 AT+CENG Report Network State

| <b>AT+CENG Report Network State</b> |  |
|-------------------------------------|--|
| Test Command<br><b>AT+CENG=?</b>    | <p>Response</p> <p>TA returns the list of supported modes.</p> <p><b>+CENG: (list of supported &lt;mode&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>&lt;mode&gt;=0 display serving cell and up to 4 neighbor cell information:</p> <p><b>+CENG:</b></p> <p><b>&lt;sc_earfcn&gt;,&lt;sc_earfcn_offset&gt;,&lt;sc_pci&gt;,&lt;sc_cellid&gt;[,&lt;sc_rsrp&gt;][,&lt;sc_rsrq&gt;][,&lt;sc_rssi&gt;][,&lt;sc_snr&gt;],&lt;sc_band&gt;,&lt;sc_tac&gt;[,&lt;sc_ecl&gt;][,&lt;sc_tx_power&gt;][,&lt;sc_re_rsrp&gt;]</b></p> <p><b>[&lt;CR&gt;&lt;LF&gt;+CENG:</b></p> <p><b>&lt;nc_earfcn&gt;,&lt;nc_earfcn_offset&gt;,&lt;nc_pci&gt;,&lt;nc_rsrp&gt;</b></p> <p><b>[...]]</b></p> <p><b>OK</b></p> <p>&lt;mode&gt;=1 display data transfer information only if modem in RRC-CONNECTED state:</p> <p><b>+CENG:</b></p> <p><b>&lt;RLC_UL_BLER&gt;,&lt;RLC_DL_BLER&gt;,&lt;MAC_UL_BLER&gt;,&lt;MAC_DL_BLER&gt;,&lt;MAC_UL_total_bytes&gt;,&lt;MAC_DL_total_bytes&gt;,&lt;MAC_UL_total_HARQ_TX&gt;,&lt;MAC_DL_total_HARQ_TX&gt;,&lt;MAC_UL_HARQ_re_TX&gt;,&lt;MAC_DL_HARQ_re_TX&gt;,&lt;RLC_UL_tput&gt;,&lt;RLC_DL_tput&gt;,&lt;MAC_UL_tput&gt;,&lt;MAC_DL_tput&gt;</b></p> <p><b>OK</b></p> |



|   |   |
|---|---|
|   | <p>If error is related to wrong AT syntax or incorrect &lt;mode&gt; or UE in incorrect state</p> <p><b>+CME ERROR: &lt;err&gt;</b></p>  |
|   | <p>Parameters</p> <p>See Write Command</p>  |
| <p>Write Command</p> <p><b>AT+CENG=&lt;mode&gt;</b></p> | <p>Response</p> <p><b>OK</b></p> <p><b>ERROR</b></p>  |
|   | <p>Parameters</p> <p><b>&lt;mode&gt;</b> Integer value indicating requested engineering information.</p> <p>    0 Radio information for serving and neighbor cells</p> <p>    1 Serving Cell/Neighbor Cell information</p> <p><b>&lt;sc_earfcn&gt;</b> Integer value indicating the EARFCN for serving cell. Range 0- 262143</p> <p><b>&lt;sc_earfcn_offset&gt;</b> Integer value indicating the EARFCN offset for serving cell:</p> <p>    0 Offset of -2</p> <p>    1 Offset of -1</p> <p>    2 Offset of -0.5</p> <p>    3 Offset of 0</p> <p>    4 Offset of 1</p> <p><b>&lt;sc_pci&gt;</b> Integer value indicating the serving cell physical cell ID. Range 0 – 503.</p> <p><b>&lt;sc_cellid&gt;</b> String type; four byte (28 bit) cell ID in hexadecimal format for serving cell.</p> <p><b>&lt;sc_rsrp&gt;</b> Signed integer indicating serving cell RSRP value in units of dBm (can be negative value). Available only in RRC-IDLE state.</p> <p><b>&lt;sc_rsrq&gt;</b> Signed integer indicating serving cell RSRQ value in units of dB (can be negative value). Available only in RRC-IDLE state.</p> <p><b>&lt;sc_rssi&gt;</b> Signed integer indicating serving cell RSSI value in units of dBm (can be negative value). Available only in RRC-IDLE state.</p> <p><b>&lt;sc_snr&gt;</b> Signed integer value. Last SNR value for serving cell in units of dB. Available only in RRC-IDLE state.</p> <p><b>&lt;sc_band&gt;</b> Integer value; current serving cell band</p> <p><b>&lt;sc_tac&gt;</b> String type; two byte tracking area code (TAC) in hexadecimal format (e.g. "00C3" equals 195 in decimal).</p> <p><b>&lt;sc_ecl&gt;</b> Integer value. Last Enhanced Coverage Level (ECL) value for serving cell. Range 0-2.</p> <p><b>&lt;sc_tx_pwr&gt;</b> Signed integer value indicating current UE transmit power. Units of cBm Centibels relative to one milliwatt (can be negative value).</p> <p><b>&lt;sc_re_rsrp&gt;</b> Signed integer indicating serving cell RSRP value (the modified) in units of dBm (can be negative value). Available only in</p> |

RRC-IDLE state.

**<nc\_earfcn>** Integer value indicating the EARFCN for neighbor cell.  
Range 0-262143

**<nc\_earfcn\_offset>** Integer value indicating the EARFCN offset for neighbor cell:

- 0 Offset of -2
- 1 Offset of -1
- 2 Offset of -0.5
- 3 Offset of 0
- 4 Offset of 1

**<nc\_pci>** Integer value indicating the neighbor cell physical cell ID.  
Range 0-503.

**<nc\_rsrp>** Signed integer indicating neighbor cell RSRP value in units of dBm (can be negative value).

Data Transfer Information: s

**<RLC\_UL\_BLER>** Integer value. Represented in % value (range 0 to 100). UL block error rate (as per IRQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established/resumed RRC connection or since previous AT+CENG query with <mode>=1, whichever is later. Only valid in RRC-CONNECTED state.

**<RLC\_DL\_BLER>** Integer value Represented in % value (range 0 to 100). DL block error rate (as per ARQ) in RLC. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.

**<MAC\_UL\_BLER>** Integer value. Represented in % value (range 0 to 100). UL block error rate (as per HARQ) in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.

**<MAC\_DL\_BLER>** Integer value. Represented in % value (range 0 to 100). DL block error rate (as per HARQ) in MAC for DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state.

**<MAC\_UL\_total\_bytes>** Integer value. Total number of transport block bytes (re)transmitted on UL-SCH. Calculated for UL-SCH over all HARQ transmissions and retransmissions. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous AT+CENG query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: bytes

**<MAC\_DL\_total\_bytes>** Integer value. Total number of transport block

bytes (re)transmitted on DL-SCH, excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: bytes

**<MAC\_UL\_total\_HARQ\_TX>** Integer value. Total number of HARQ (re)transmissions for transport blocks on UL-SCH.

Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions

**<MAC\_DL\_total\_HARQ\_TX>** Integer value. Total number of HARQ (re)transmissions for transport blocks on DL-SCH, excluding BCCH.

Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: (re)transmissions

**<MAC\_UL\_HARQ\_re\_TX>** Integer value. Number of HARQ retransmissions for transport blocks on UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions

**<MAC\_DL\_HARQ\_re\_TX>** Integer value. Number of HARQ retransmissions for transport blocks on DL-SCH, excluding BCCH.

Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: retransmissions.

**<RLC\_UL\_tput>** Integer value. RLC uplink throughput. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s

**<RLC\_DL\_tput>** Integer value. RLC downlink throughput. Calculated over all established RLC AM radio bearers. Calculated from the beginning of successfully established / resumed RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s

**<MAC\_UL\_tput>** Integer value. UL throughput in MAC for UL-SCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous **AT+CENG** query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s

**<MAC\_DL\_tput>** Integer value. DL throughput in MAC for DL-SCH,

|                       |   |
|-----------------------|---|
|                       | excluding BCCH. Calculated from the beginning of successfully established / resumed / re-established RRC connection, or since previous <b>AT+CENG</b> query with <mode>=1, whichever is later. Available only in RRC-CONNECTED state. Unit: kbits / s |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note<br>If modem is not in RRC-CONNECTED state then +CENG will not be generated for <mode>= 1. Only OK response will be generated.  |

#### 4.2.7 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><b>OK</b> |
| Parameter Saving Mode               | NO_SAVE  |
| Max Response Time                   | -  |
| Reference                           | Note   |

#### 4.2.8 AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications

| AT+EXUNSOL Enable or Disable Proprietary Unsolicited Indications |   |
|--|---|
| Test Command<br><b>AT+EXUNSOL=?</b>                              | Response<br><b>+EXUNSOL:</b> (list of supported <exunsol>s)<br><b>OK</b>                            |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+EXUNSOL=&lt;exunsol&gt;,&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  |

|                       |  |
|-----------------------|--|
|                       | <p><b>&lt;exunsol&gt;</b> String type(string should be included in quotation marks). values are currently reserved by the present document</p> <p>"SQ" Signal Quality Report</p> <p>Displays signal strength and channel bit error rate (similar to AT+CSQ) in form +CSQN: &lt;rss&gt;,&lt;ber&gt;when values change.</p> <p><b>&lt;mode&gt;</b></p> <p>0 Disable</p> <p>1 Enable</p> <p>2 Query</p> |
| Parameter Saving Mode | AT&W_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

#### 4.2.9 AT+GSV Display Product Identification Information

| AT+GSV Display Product Identification Information |   |
|---|---|
| Execution Command<br>AT+GSV                       | <p>Response</p> <p>TA returns product information text</p> <p>Example:</p> <p><b>SIMCOM_Ltd</b></p> <p><b>SIM7020C</b></p> <p><b>Revision: 1752B01SIM7020C</b></p> <p><b>OK</b></p> |
| Parameter Saving Mode                             | NO_SAVE   |
| Max Response Time                                 | -   |
| Reference   | Note  |

#### 4.2.10 AT\*CELLLOCK Set the List of ARFCN Which Needs to Be Locked

| AT*CELLLOCK Set the List of ARFCN Which Needs to Be Locked |  |
|--|--|
| Test Command<br>AT*CELLLOC<br>K=?                          | <p>Response</p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p> |
| Read Command   | Response   |

|   |   |
|---|---|
| <b>AT*CELLLOCK?</b>   | <b>*CELLLOCK: &lt;lock&gt;[,&lt;earfcn&gt;,&lt;earfcn_offset&gt;[,&lt;pci&gt;]]</b>   |
|   | <b>OK</b>   |
|   | Parameter<br>See Write Command  |
| Write Command<br><b>AT*CELLLOCK</b><br><b>K=&lt;lock&gt;[,&lt;earfcn&gt;,&lt;earfcn_offset&gt;[,&lt;pci&gt;]]</b> | Response<br><b>OK</b><br>If error is related to wrong AT syntax or incorrect parameters.<br><b>ERROR</b>  |
|   | Parameter<br><b>&lt;lock&gt;</b> Integer value indicating whether to activate lock, or remove lock:<br>0 Remove lock<br>1 Activate lock<br><b>&lt;earfcn&gt;</b> Integer value indicating requested EARFCN on which to lock.<br>Range 0- 262143. Value of 0 indicates to remove any lock for EARFCN and Cell.<br><b>&lt;earfcn_offset&gt;</b> Integer value indicating requested EARFCN offset:<br>0 Offset of -2<br>1 Offset of -1<br>2 Offset of -0.5<br>3 Offset of 0<br>4 Offset of 1<br><b>&lt;pci&gt;</b> Integer value: Physical cell ID. Range: 0-503 |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

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

| <b>AT+SLEDS Set the Timer Period of Net Light</b> |   |
|---|---|
| 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><br><br><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><br><br>Parameters<br><b>&lt;mode&gt;</b><br>1 Set the timer period of net light while SIM7020 series does not register to the network<br>2 Set the timer period net light while SIM7020 series has already registered to the network<br>3 Set the timer period net light while SIM7020 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  | AUTO_SAVE  |
| 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<br>3,64,300  |

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

| <b>AT+CNETLIGHT Close the Net Light or Open It to Shining</b> |  |
|---|--|
| Test Command<br><b>AT+CNETLIGHT=?</b>                         | Response<br><b>+CNETLIGHT: (0,1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CNETLIGHT?</b>                          | Response<br><b>+CNETLIGHT: &lt;mode&gt;</b><br><br><b>OK</b>                                 |

|   |   |
|---|---|
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CNETLIGHT=&lt;mode&gt;</b> | Response<br><b>OK</b><br>or<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  |

#### 4.2.13 AT+CSMINS SIM Inserted Status Reporting

| AT+CSMINS SIM Inserted Status Reporting     |   |
|---|---|
| Test Command<br><b>AT+CSMINS=?</b>          | Response<br><b>+CSMINS: (list of supported &lt;n&gt;s)</b><br><br><b>OK</b>   |
|   | Parameter<br>See Write Command  |
| Read Command<br><b>AT+CSMINS?</b>           | Response<br><b>+CSMINS: &lt;n&gt;,&lt;SIM inserted&gt;</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSMINS=&lt;n&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b><br>If error is related to ME functionality:<br><b>+CME ERROR: &lt;err&gt;</b> |
|   | Unsolicited Result Code<br><b>+CSMINS: &lt;n&gt;,&lt;SIM inserted&gt;</b>   |
|   | Parameters<br><b>&lt;n&gt;</b> A numeric parameter to show an unsolicited event code                                      |



|                       |  |
|-----------------------|--|
|                       | <p>indicating whether the SIM has been inserted or removed.</p> <p><u>0</u>     Disable</p> <p>1     Enable</p> <p><b>&lt;SIM inserted&gt;</b>     A numeric parameter which indicates whether SIM card has been inserted.</p> <p>0     Not inserted</p> <p>1     Inserted</p> |
| Parameter Saving Mode | AT&W_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

#### 4.2.14 AT+CSPCHSC Set Scrambling Algorithm for NPDSCH

| AT+CSPCHSC Set Scrambling Algorithm for NPDSCH  |   |
|---|---|
| Test Command<br><b>AT+CSPCHSC=?</b>             | <p>Response</p> <p><b>+CSPCHSC: (0-1)</b></p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>  |
| Read Command<br><b>AT+CSPCHSC?</b>              | <p>Response</p> <p><b>+CSPCHSC: &lt;mode&gt;</b></p> <p><b>OK</b></p> <p>Parameter</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CSPCHSC=&lt;mode&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>If error is related to wrong AT syntax or incorrect parameters.</p> <p><b>ERROR</b></p> <p>Parameter</p> <p><b>&lt;mode&gt;</b></p> <p>0     Close scrambling     algorithm</p> <p><u>1</u>     Open scrambling     algorithm (default)</p> |
| Parameter Saving Mode                           | AUTO_SAVE   |
| Max Response Time                               | -   |
| Reference                                       | Note  |

#### 4.2.15 AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication

| AT+CPSMSTATUS Enable Deep Sleep Wakeup Indication    |   |
|--|---|
| Test Command<br><b>AT+CPSMSTATUS=?</b>               | Response<br><b>+CPSMSTATUS: (0-1)</b>   |
|  | <b>OK</b>   |
|  | Parameter<br>See Write Command  |
| Read Command<br><b>AT+CPSMSTATUS?</b>                | Response<br><b>+CPSMSTATUS: &lt;enable&gt;</b>  |
|  | <b>OK</b>   |
|  | Parameter<br>See Write Command  |
| Write Command<br><b>AT+CPSMSTATUS=&lt;enable&gt;</b> | Response<br><b>OK</b>   |
|  | If error is related to wrong AT syntax or incorrect parameters.<br><b>ERROR</b>   |
|  | Parameter<br><b>&lt;enable&gt;</b><br>0 Disable indication on this channel when modem wakes up from deep sleep<br>1 Enable indication on this channel when modem wakes up from Deep sleep |
| Parameter Saving Mode                                | AT&W_SAVE   |
| Max Response Time                                    | -   |
| Reference  | Note  |

#### 4.2.16 AT+CSCLK Configure Slow Clock

| AT+CSCLK Configure Slow Clock     |   |
|-----------------------------------|---|
| Test Command<br><b>AT+CSCLK=?</b> | Response<br><b>+CSCLK: (list of supported &lt;n&gt;s)</b> |
|                                   | <b>OK</b>   |
|                                   | Parameters<br>See Write Command                           |

|  |  |
|--|--|
| Read Command<br><b>AT+CSCLK?</b>           | <p>Response<br/><b>+CSCLK: &lt;n&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CSCLK=&lt;n&gt;</b> | <p>Response<br/><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters<br/><b>&lt;n&gt;</b></p> <ul style="list-style-type: none"> <li><u>0</u>     Disable slow clock, module will not enter sleep mode.</li> <li>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.</li> <li>2     Enable slow clock automatically. When there is no interrupt (on air and hardware such as GPIO interrupt or data in serial port), module can enter sleep mode. Otherwise, it will quit sleep mode.</li> </ul>  |
| Parameter Saving Mode                      | AUTO_SAVE  |
| Max Response Time                          | -  |
| Reference                                  | <p>Note</p> <ul style="list-style-type: none"> <li>● Only UART1 can enable csclk as 1 or 2.</li> <li>● There are two caveats when you want to quit sleep mode in mode 2:<br/>1, You should input some characters (at least one) to awake module<br/>2, An interval time of 100ms more is necessary between waking characters and following AT commands, otherwise the waking characters will not be discarded completely, and messy codes will be produced which may leads to UART baudrate re-adaptation.</li> <li>● Scope of parameter &lt;n&gt; is different among SIM7020 series project, please refer to chapter 21 for details.</li> </ul> |

#### 4.2.17 AT+CRESET Trigger WDT Reset

| AT+CRESET Trigger WDT Reset        |                               |
|------------------------------------|-------------------------------|
| Test Command<br><b>AT+CRESET=?</b> | <p>Response<br/><b>OK</b></p> |

|                                       |   |
|---------------------------------------|---|
| Execution Command<br><b>AT+CRESET</b> | Response<br><br>If it succeeds, the system will reboot immediately. |
| Parameter Saving Mode                 | NO_SAVE   |
| Max Response Time                     | -   |
| Reference                             | Note  |

#### 4.2.18 AT+CREVHEX Control the Data Output Format

| <b>AT+CREVHEX Control the Data Output Format</b> |  |
|--|--|
| Test Command<br><b>AT+CREVHEX=?</b>              | Response<br><b>+CREVHEX:</b> (list of supported <n>s)<br><br><b>OK</b>   |
| Read Command<br><b>AT+CREVHEX?</b>               | Response<br><b>+CREVHEX:</b> <n><br><br><b>OK</b>  |
| Write Command<br><b>AT+CREVHEX=&lt;n&gt;</b>     | Response<br><b>OK</b><br>If error is related to wrong AT syntax or incorrect parameters.<br><b>ERROR</b><br><br>Parameters<br><n><br>0     The data output format is raw data.<br>1     The data output format is hexadecimal. |
| Parameter Saving Mode                            | AUTO_SAVE  |
| Max Response Time                                | -  |
| Reference  | Note   |

#### 4.2.19 AT+CDISAUPDN Control the Auto PDN Status

| <b>AT+CDISAUPDN Control the Auto PDN Status</b> |   |
|---|---|
| Test Command<br><b>AT+CDISAUPDN=?</b>           | Response<br><b>+CDISAUPDN:</b> (list of supported <n>s) |

|  |   |
|--|---|
|  | <b>OK</b>   |
| Read Command<br><b>AT+CDISAUPDN?</b>           | Response<br><b>+CDISAUPDN: &lt;n&gt;</b><br><br><b>OK</b>   |
| Write Command<br><b>AT+CDISAUPDN=&lt;n&gt;</b> | Response<br><b>OK</b><br>If error is related to wrong AT syntax or incorrect parameters.<br><b>ERROR</b><br><br>Parameters<br><b>&lt;n&gt;</b><br>0     Diabile Auto PDN,should reboot the module to check.<br>1     Enable Auto PDN,should reboot the module to check. |
| Parameter Saving Mode                          | AUTO_SAVE   |
| Max Response Time                              | -   |
| Reference                                      | Note  |

#### 4.2.20 AT+CNWRCCFG Network Recovery Configure

| AT+CNWRCCFG Network Recovery Configure               |  |
|--|--|
| Test Command<br><b>AT+CNWRCCFG=?</b>                 | Response<br><b>+CNWRCCFG: (5-28800), (5-28800), (5-28800), (5-28800), (5-28800) , (5-28800)</b><br><br><b>OK</b><br><br>Parameter<br>See Write Command   |
| Read Command<br><b>AT+CNWRCCFG?</b>                  | Response<br><b>+CNWRCCFG:</b><br><b>&lt;recovery_internal1&gt;,&lt;recovery_internal2&gt;,&lt;recovery_internal3&gt;,&lt;recovery_internal4&gt;,&lt;recovery_internal5&gt;,&lt;recovery_internal6&gt;</b><br><br><b>OK</b><br><br>Parameter<br>See Write Command |
| Write Command<br><b>AT+CNWRCCFG=&lt;recovery_int</b> | Response<br><b>OK</b><br>If error is related to ME functionality:  |

|  |  |
|--|--|
| ernal1>,<recovery_internal2>,<recovery_internal3>,<recovery_internal4>,<recovery_internal5>,<recovery_internal6> | <b>+CME ERROR: &lt;err&gt;</b><br>Parameter<br><recovery_internal1> 1 step network searching interval after out of service<br>Range: 5-28800(s) Default: 5(s)<br><recovery_internal2> 2 step network searching interval after out of service<br>Range: 5-28800(s) Default: 10(s)<br><recovery_internal3> 3 step network searching interval after out of service<br>Range: 5-28800(s) Default: 10(s)<br><recovery_internal4> 4 step network searching interval after out of service<br>Range: 5-28800(s) Default: 1(s)<br><recovery_internal5> 5 step network searching interval after out of service<br>Range: 5-28800(s) Default: 120(s)<br><recovery_internal6> 6 step network searching interval after out of service<br>Range: 5-28800(s) Default: 7200(s) |
| Parameter Saving Mode  | AUTO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note<br>The config will effect after rebooting.  |

#### 4.2.21 AT+CURTC Control CCLK Show URC Or RTC Time

| AT+CURTC Control CCLK Show URC Or RTC Time |  |
|--|--|
| Test Command<br>AT+CURTC=?                 | Response<br><b>+CURTC: (0,1)</b>       |
|  | <b>OK</b>                              |
|  | Parameters<br>See Write Command        |
| Read Command<br>AT+CURTC?                  | Response<br><b>+CURTC: &lt;opt&gt;</b> |
|  | <b>OK</b>                              |
|  | Parameter<br>See Write Command         |
| Write Command                              | Response                               |

|                             |  |
|-----------------------------|--|
| <b>AT+CURTC=&lt;opt&gt;</b> | <b>+CURTC: &lt;opt&gt;</b>   |
|                             | <b>OK</b>  |
|                             | Parameters<br><b>&lt;opt&gt;</b> A numeric parameter ,The default opt=0.<br>1 CCLK show RTC time after network time synchronization<br>0 CCLK show UTC time after network time synchronization |
| Parameter Saving Mode       | AUTO_SAVE_REBOOT   |
| Max Response Time           | -  |
| Reference                   | Note   |

#### 4.2.22 AT+CHOMENW Display Home Network Information

| <b>AT+CHOMENW Display Home Network Information</b> |   |
|--|---|
| Test Command<br><b>AT+CHOMENW=?</b>                | Response<br><b>OK</b>   |
|  | Parameters<br>See Read Command  |
| Read Command<br><b>AT+CHOMENW?</b>                 | Response<br>UE returns the home network information (extracted form the IMSI)in long alpha,short alpha and numeric formats.<br><b>+CHOMENW: &lt;oper_long&gt;,&lt;oper_short&gt;,&lt;oper_numeric&gt;</b>   |
|  | <b>OK</b>   |
|  | Parameters<br><b>&lt;oper_long&gt;</b> Home operator in long alphanumeric format<br><b>&lt;oper_short&gt;</b> Home operator in short alphanumeric format<br><b>&lt;oper_numeric&gt;</b> Home operator in numeric GSM Location Area Identification number format |
| Parameter Saving Mode                              | -   |
| Max Response Time                                  | -   |
| Reference  | Note  |

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

| <b>AT+CBATCHK Set VBAT Checking Feature ON/OFF</b> |          |
|--|----------|
| Test Command                                       | Response |

|                                    |  |
|------------------------------------|--|
| AT+CBATCHK=?                       | +CBATCHK: (0,1)<br><br>OK  |
| Read Command<br>AT+CBATCHK?        | Response<br>+CBATCHK: <mode><br><br>OK<br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CBATCHK=<mode> | Response<br>OK<br>If failed:<br>+CME ERROR: <err><br><br>Parameters<br><mode><br>0   Close the function of VBAT checking<br>1   Open the function of VBAT checking |
| Parameter Saving Mode              |  |
| Max     Response Time              | -  |
| Reference                          |  |

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

| AT+CGPIO   Control the GPIO by PIN Index                            |   |
|---|---|
| Test Command<br>AT+CGPIO=?  | Response<br>+CGPIO: (0-1),( list of supported <pin>s),(0-1),(0-1)<br><br>OK<br><br>Parameters<br>See Write Command  |
| Write Command<br>AT+CGPIO=<operation>,<pin>,<function>,<level><br>> | Response<br>OK<br>or<br>ERROR<br><br>Parameters<br><operation><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 |



|           |   |
|-----------|---|
|           | <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> |
| Reference | Note  |

#### 4.2.25 AT\*MEDRXCFC eDRX Configuration

| AT*MEDRXCFC eDRX Configuration   |   |
|--|---|
| Test Command<br>AT*MEDRXCFC<br>G=?   | <p>Response</p> <p>*MEDRXCFC: ( list of supported <b>&lt;mode&gt;s</b>), ( list of supported <b>&lt;AcT-type&gt;s</b>), ( list of supported <b>&lt;Requested_eDRX_value&gt;s</b>), ( list of supported <b>&lt;Requested_Paging_time_window_value&gt;s</b>)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br>AT*MEDRXCFC<br>G?  | <p>Response</p> <p>[*MEDRXCFC:<br/> <b>&lt;AcT-type&gt;</b>,<b>&lt;Requested_eDRX_value&gt;</b>[,<b>&lt;Requested_Paging_time_window_value&gt;</b>]<br/>          <b>&lt;CR&gt;&lt;LF&gt;</b>*MEDRXCFC:<br/> <b>&lt;AcT-type&gt;</b>,<b>&lt;Requested_eDRX_value&gt;</b>[,<b>&lt;Requested_Paging_time_window_value&gt;</b>]<br/>         [...]]</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Write Command<br>AT*MEDRXCFC<br>G=[ <b>&lt;mode&gt;</b> ], <b>&lt;AcT-type&gt;</b> [, <b>&lt;Requested_eDRX_value&gt;</b> [, <b>&lt;Requested_Paging_time_window_value&gt;</b> ] | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p>+CME ERROR: <b>&lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b> Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access</p>   |

|                                  |   |
|----------------------------------|---|
| <p><b>ndow_value&gt;]]]]</b></p> | <p>technology, i.e. the most recent setting of &lt;mode&gt; will take effect for all specified values of &lt;AcT&gt;.</p> <ul style="list-style-type: none"> <li>0 Disable the use of eDRX</li> <li>1 Enable the use of eDRX</li> <li>2 Enable the use of eDRX and enable the unsolicited result code</li> </ul> <p><b>+CEDRXP:</b></p> <p><b>&lt;AcT-type&gt;[,&lt;Requested_eDRX_value&gt;[,&lt;NW-provided_eDRX_value&gt;[,&lt;Paging_time_window&gt;]]]</b></p> <ul style="list-style-type: none"> <li>3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</li> </ul> <p><b>&lt;AcT-type&gt;</b> Integer type, indicates the type of access technology. This AT- command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <ul style="list-style-type: none"> <li>0 Access technology is not using eDRX. This parameter value is only use in the unsolicited result code.</li> <li>5 E-UTRAN (NB-S1 mode)</li> </ul> <p><b>&lt;Requested_eDRX_value&gt;</b> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.</p> <p><b>&lt;Requested_Paging_time_window_value&gt;</b> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p> <p><b>&lt;NW-provided_eDRX_value&gt;</b> String type; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub- clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p> <p><b>&lt;Paging_time_window&gt;</b> String type; half a byte in a 4-bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.</p> |
| <p>Reference</p>                 | <p>Note</p>   |

## 5 AT Commands for TCPIP Application Toolkit

### 5.1 Overview of AT Commands for TCPIP Application Toolkit

| Command        | Description                                       |
|----------------|---|
| AT+CSOC        | Create a TCP/UDP socket                           |
| AT+CSOCON      | Connect socket to remote address and port         |
| AT+CSOB        | Bind local address and local port                 |
| AT+RETENTION   | Retention of socket scene                         |
| AT+CSOSEND     | Send data to remote via socket                    |
| AT+CSODSEND    | Send data to remote via socket with data mode     |
| AT+CSOCL       | Close socket                                      |
| AT+CSOSENDFLAG | Set TCP send flag                                 |
| AT+CSORCVFLAG  | Set receive flag                                  |
| AT+CSOSTATUS   | Get socket status                                 |
| AT+CSOACK      | Query previous connection data transmitting state |
| AT+CSOALIVE    | Set TCP keepalive parameters                      |
| +CSONMI        | Socket message arrived indicator                  |
| +CSOERR        | Socket error indicator                            |

### 5.2 Detailed Descriptions of AT Commands for TCPIP Application Toolkit

#### 5.2.1 AT+CSOC Create a TCP/UDP Socket

| AT+CSOC Create a TCP/UDP Socket |   |
|---------------------------------|---|
| Test Command<br>AT+CSOC=?       | Response<br>+CSOC: (1-2),(1-3),(1-3)<br><br><b>OK</b><br><br>Parameters<br>See Write Command            |
| Read Command<br>AT+CSOC?        | Response<br><b>OK</b><br>or<br>+CSOC: <socket_id>[<CR><LF><br>+CSOC: <socket_id>[...]]<br><br><b>OK</b> |

|   |   |
|---|---|
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSOC=&lt;do main&gt;,&lt;type&gt;,&lt;protocol&gt;[,&lt;cid&gt;]</b> | Response<br><b>+CSOC: &lt;socket_id&gt;</b><br><b>OK</b><br><br>Parameters<br><b>&lt;socket_id&gt;</b> Integer socket_id<br><b>&lt;domain&gt;</b> Integer<br>1 IPv4<br>2 IPv6<br><b>&lt;type&gt;</b> Integer<br>1 TCP<br>2 UDP<br>3 RAW<br><b>&lt;protocol&gt;</b> Integer<br>1 IP<br>2 ICMP<br>3 UDP_LITE<br><b>&lt;cid&gt;</b> Integer, PDP context ID, AT+CGACT response. [option] |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

### 5.2.2 AT+CSOCON Connect Socket To Remote Address and Port

| <b>AT+CSOCON Connect Socket to Remote Address and Port</b> |   |
|--|---|
| Test Command<br><b>AT+CSOCON=?</b>                         | Response<br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CSOCON?</b>                          | Response<br>If connection exist.<br><b>+CSOCON: &lt;socket_id&gt;,&lt;type&gt;[&lt;CR&gt;&lt;LF&gt;</b><br><b>+CSOCON: &lt;socket_id&gt;,&lt;type&gt;[...]]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Write Command<br><b>AT+CSOCON=&lt;</b>                     | Response<br><b>OK</b>   |

|   |   |
|---|---|
| <b>socket_id,&lt;remote_port&gt;,&lt;remote_address&gt;</b> | Parameters<br><b>&lt;socket_id&gt;</b> Integer socket_id<br><b>&lt;remote_port&gt;</b> Integer, remote port.<br><b>&lt;remote_address&gt;</b> String, remote address.<br><b>&lt;type&gt;</b> Integer<br>1 TCP<br>2 UDP<br>3 RAW |
| Parameter Saving Mode                                       | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

### 5.2.3 AT+CSOB Bind Local Address and Local Port

| <b>AT+CSOB Bind Local Address and Local Port</b>                                 |  |
|--|--|
| Test Command<br><b>AT+CSOB=?</b>   | Response<br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+CSOB?</b>  | Response<br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CSOB=&lt;socket_id&gt;,&lt;port&gt;[,&lt;address&gt;]</b> | Response<br><b>OK</b>  |
|  | Parameters<br><b>&lt;socket_id&gt;</b> Integer type,socket_id<br><b>&lt;port&gt;</b> Integer type, port.<br><b>&lt;address&gt;</b> String type, address. |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

### 5.2.4 AT+RETENTION Retention of Socket Scene

| <b>AT+RETENTION Retention of Socket Scene</b> |                                      |
|---|--------------------------------------|
| Test Command<br><b>AT+RETENTION</b>           | Response<br><b>+RETENTION: (0-1)</b> |

|   |   |
|---|---|
| N=?   | OK  |
|   | Parameters<br>See Write Command   |
| Read Command<br>AT+RETENTION<br>N?                    | Response<br>+RETENTION: <retention_socket>  |
|   | OK<br>Parameters<br>See Write Command   |
| Write Command<br>AT+RETENTION<br>N=<retention_socket> | Response<br>OK  |
|   | Parameters<br><retention_socket> Integer type<br>0 Not recovery scene when module exited psm mode<br>1 Recovery scene when module exited psm mode |
| Parameter Saving Mode                                 | NO_SAVE   |
| Max Response Time                                     | -   |
| Reference   | Note<br>AT+CPSMS should be set before this command.   |

### 5.2.5 AT+CSOSEND Send Data to Remote via Socket

| AT+CSOSEND Send Data to Remote via Socket                          |  |
|--|--|
| Test Command<br>AT+CSOSEND=?                                       | Response<br>OK   |
|  | Parameters<br>See Write Command  |
| Write Command<br>AT+CSOSEND=<br><socket_id>,<data<br>a_len>,<data> | Response<br>If CSOSENDFLAG is 0.<br>OK<br>If CSOSENDFLAG is 1 and socket type is TCP.<br>OK<br><br>SEND: <socket_id>,<len>   |
|  | Parameters<br><socket_id> Integer type,socket_id, AT+CSOC's response.<br><data_len> Integer type, length of data<br><data> Raw_data, data context. Maximum data size is 512 bytes.<br>If <data_len> is 0 you can send str to remote socket with Double |

|                       |   |
|-----------------------|---|
|                       | quotation, otherwise the format of data should be Hex and the length must be Equal to the <data_len>.<br><len> Integer type, length of data |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |

### 5.2.6 AT+CSODSEND Send Data to Remote via Socket with Data Mode

| AT+CSODSEND Send Data to Remote via Socket with Data Mode   |   |
|---|---|
| Test Command<br><b>AT+CSODSEND=?</b>  | Response<br><b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSODSEND=&lt;socket_id&gt;,&lt;data_len&gt;</b><br>response">", then tap data for send   | Response<br>If CSODSENDFLAG is 0.<br><b>DATA ACCEPT: &lt;len&gt;</b><br>If CSODSENDFLAG is 1 and socket type is TCP.<br><b>DATA ACCEPT: &lt;len&gt;</b><br><br><b>SEND: &lt;socket_id&gt;,&lt;len&gt;</b>   |
|   | Parameters<br><socket_id> Integer type, socket_id, AT+CSOC's response.<br><data_len> Integer type, length of data you want to send, 1-768.<br><len> Integer type, length of data that remote have received. |
| Execution Command<br><b>AT+CSODSEND=&lt;socket_id&gt;</b><br>response">", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the operation | Response<br>If CSODSENDFLAG is 0.<br><b>DATA ACCEPT: &lt;len&gt;</b><br>If CSODSENDFLAG is 1 and socket type is TCP.<br><b>DATA ACCEPT: &lt;len&gt;</b><br><br><b>SEND: &lt;socket_id&gt;,&lt;len&gt;</b>   |
|   | Parameters<br>See Write Command   |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

## 5.2.7 AT+CSOCL Close Socket

| AT+CSOCL Close Socket                              |   |
|--|---|
| Test Command<br><b>AT+CSOCL=?</b>                  | Response<br><b>OK</b><br><br>Parameters<br>See Write Command                          |
| Write Command<br><b>AT+CSOCL=&lt;socket_id&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;socket_id&gt;</b> Integer socket_id |
| Parameter Saving Mode                              | NO_SAVE   |
| Max Response Time                                  | -   |
| Reference  | Note  |

## 5.2.8 AT+CSOSENDFLAG Set TCP Send Flag

| AT+CSOSENDFLAG Set TCP Send Flag                    |  |
|---|--|
| Test Command<br><b>AT+CSOSENDFLAG=?</b>             | Response<br><b>+CSOSENDFLAG: (0,1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command                                       |
| Read Command<br><b>AT+CSOSENDFLAG?</b>              | Response<br><b>+CSOSENDFLAG: &lt;flag&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command                                |
| Write Command<br><b>AT+CSOSENDFLAG=&lt;flag&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;flag&gt;</b> TCP send flag<br>0 Disable send flag feature<br>1 Enable this feature |
| Parameter Saving Mode                               | AUTO_SAVE  |
| Max Response Time                                   | -  |



|           |  |
|-----------|--|
| Reference | Note<br>If <flag> is 1, the URC will be shown in related command AT+CSOSEND and AT+CSODSEND. |
|-----------|--|

### 5.2.9 AT+CSORCVFLAG Set Receive Flag

| AT+CSORCVFLAG Set Receive Flag                     |  |
|--|--|
| Test Command<br><b>AT+CSORCVFLAG=?</b>             | Response<br><b>+CSORCVFLAG: (0,1)</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+CSORCVFLAG?</b>              | Response<br><b>+CSORCVFLAG: &lt;flag&gt;</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CSORCVFLAG=&lt;flag&gt;</b> | Response<br><b>OK</b>  |
|  | Parameters<br><b>&lt;flag&gt;</b> TCP receive flag<br><b>0</b> Receive data form remote socket with hex.<br><b>1</b> Receive data form remote socket with string |
| Parameter Saving Mode                              | AUTO_SAVE  |
| Max Response Time                                  | -  |
| Reference  | Note   |

### 5.2.10 AT+CSOSTATUS Get Socket Status

| AT+CSOSTATUS Get Socket Status        |   |
|---------------------------------------|---|
| Test Command<br><b>AT+CSOSTATUS=?</b> | Response<br><b>+CSOSTATUS: (0-10)</b><br><br><b>OK</b>          |
|                                       | Parameters<br>See Write Command                                 |
| Write Command<br><b>AT+CSOSTATUS</b>  | Response<br><b>+CSOSTATUS: &lt;socket_id&gt;,&lt;status&gt;</b> |

|                       |  |
|-----------------------|--|
| S=<socket_id>         | <p><b>OK</b></p> <p>Parameters</p> <p>&lt;socket_id&gt; Integer, socket id, AT+CSOC's response.</p> <p>&lt;status&gt; Integer</p> <p>0 None socket</p> <p>1 Socket create but not connect.</p> <p>2 Connected.</p> |
| Parameter Saving Mode | -  |
| Max Response Time     | -  |
| Reference             | Note   |

### 5.2.11 AT+CSOACK Query Previous Connection Data Transmitting State

| AT+CSOACK Query Previous Connection Data Transmitting State |   |
|---|---|
| Test Command<br>AT+CSOACK=?                                 | <p>Response</p> <p><b>+CSOACK: (0-4)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>AT+CSOACK=<socket_id>                      | <p>Response</p> <p><b>+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;socket_id&gt; Integer, socket id, AT+CSOC's response.</p> <p>&lt;txlen&gt; The data amount which has been sent</p> <p>&lt;acklen&gt; The data amount confirmed successfully by the server</p> <p>&lt;nacklen&gt; The data amount without confirmation by the server</p> |
| Execution Command<br>AT+CSOACK                              | <p>Response</p> <p><b>+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;[&lt;CR&gt;&lt;LF&gt;+CSOACK: &lt;socket_id&gt;,&lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;[...]]</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Parameter Saving Mode                                       | -   |

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

### 5.2.12 AT+CSOALIVE Set TCP Keepalive Parameters

| AT+CSOALIVE Set TCP Keepalive Parameters  |   |
|---|---|
| Test Command<br><b>AT+CSOALIVE=?</b>  | <p>Response</p> <p><b>+CSOALIVE: (0-4),(0-1),(30-7200),(30-600),(1-9)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Read Command<br><b>AT+CSOALIVE?</b>   | <p>Response</p> <p><b>+CSOALIVE:</b><br/><b>&lt;socket_id&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;][&lt;CR&gt;&lt;LF&gt;</b><br/><b>+CSOALIVE:</b><br/><b>&lt;socket_id&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;][...]]</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CSOALIVE=&lt;socket_id&gt;,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b><br><b>  </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;socket_id&gt;</b> Integer type, socket_id, AT+CSOC's response.</p> <p><b>&lt;mode&gt;</b> Set TCP keepalive option.<br/> <u>0</u> Disable TCP keep alive mechanism<br/> <u>1</u> Enable TCP keep alive mechanism<br/> if &lt;mode&gt; = 0, executing "AT+CSOALIVE=&lt;socket_id&gt;,&lt;mode&gt;"</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> |

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

### 5.2.13 +CSOEMI Socket message arrived indicator

| +CSOEMI Socket message arrived indicator |   |
|--|---|
|  | <p>Response</p> <p>Indicated there is received some data from network.</p> <p><b>+CSOEMI: &lt;socket_id&gt;,&lt;data_len&gt;,&lt;data&gt;</b></p>                             |
|  | <p>Parameters</p> <p><b>&lt;socket_id&gt;</b> Integer socket_id</p> <p><b>&lt;data_len&gt;</b> Integer, length of data</p> <p><b>&lt;data&gt;</b> Raw_data, data context.</p> |

### 5.2.14 +CSOERR Socket error indicator

| +CSOERR Socket error indicator |  |
|--------------------------------|--|
|                                | <p>Response</p> <p>Indicated there is some error.</p> <p><b>+CSOERR: &lt;socket_id&gt;,&lt;error_code&gt;</b></p>  |
|                                | <p>Parameters</p> <p><b>&lt;socket_id&gt;</b> Integer, socket id, AT+CSOC's response.</p> <p><b>&lt;error_code&gt;</b></p> <ul style="list-style-type: none"> <li>-1 Common error</li> <li>1 Route error</li> <li>2 Connection abort error</li> <li>3 Reset error</li> <li>4 Connected error</li> <li>5 Value error</li> <li>6 Buffer error</li> <li>7 Block error</li> <li>8 Addr in use error</li> <li>9 ALR connecting error</li> <li>10 ALR connected error</li> <li>11 NETIF error</li> <li>12 PARAMETER error</li> </ul> |

## 6 AT Commands for TCPIP Application Toolkit to Compatible with SIM800 Serials

### 6.1 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 or CSD           |
| AT+CIFSR      | Get local IP address                                    |
| 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+CIPHEXS    | Show data in hex mode of a package received             |
| AT+CIFSREX    | Get local IP address                                    |
| AT+CIPATS     | Set auto sending timer                                  |
| AT+CIPSPRT    | Set prompt of '>' when module sends data                |
| AT+CIPSERVER  | Configure module as server                              |
| AT+CIPCSGP    | Set CSD or GPRS for connection mode                     |
| AT+CIPSRIP    | Show remote IP address and port when received data      |
| AT+CIPSHOWTP  | Display transfer protocol in IP head when received data |
| AT+CIPUDPMODE | UDP extended mode                                       |
| AT+CIPRXGET   | Get data from network manually                          |
| AT+CIPTKA     | Set TCP keep alive parameters                           |
| AT+CIPMODE    | Open transparent mode                                   |
| AT+CIPCHAN    | Enter transparent mode                                  |

## 6.2 Detailed Descriptions of Commands

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

| AT+CIPMUX Start Up Multi-IP Connection      |  |
|---|--|
| Test Command<br><b>AT+CIPMUX=?</b>          | Response<br><b>+CIPMUX: (0,1)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Read Command<br><b>AT+CIPMUX?</b>           | Response<br><b>+CIPMUX: &lt;n&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPMUX=&lt;n&gt;</b> | 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> |

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

| AT+CIPSTART Start Up TCP or UDP Connection |   |
|--|---|
| Test Command<br><b>AT+CIPSTART=?</b>       | Response<br>1) If <b>AT+CIPMUX=0</b><br><b>+CIPSTART: (list of supported &lt;mode&gt;),( &lt;IP address&gt;),( &lt;port&gt;)</b><br><b>+CIPSTART: (list of supported &lt;mode&gt;),( &lt;domain name&gt;),( &lt;port&gt;)</b><br><br><b>OK</b><br>2) If <b>AT+CIPMUX=1</b><br><b>+CIPSTART: (list of supported &lt;n&gt;),(list of supported &lt;mode&gt;),( &lt;IP</b> |

|   |   |
|---|---|
|   | <p><b>address&gt;),( &lt;port&gt;)</b></p> <p><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=</b><br/><b>&lt;mode&gt;,&lt;IP address&gt;,&lt;port&gt;</b><br/>or<br/><br/><b>AT+CIPSTART=</b><br/><b>&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=</b><br/><b>&lt;n&gt;,&lt;mode&gt;,&lt;address&gt;,&lt;port&gt;</b></p> <p><b>AT+CIPSTART=</b><br/><b>&lt;n&gt;,&lt;mode&gt;,&lt;domain name&gt;,&lt;port&gt;</b></p> | <p>Response</p> <p>1)If single IP connection (<b>+CIPMUX=0</b>)<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/><b>&lt;n&gt;, ALREADY CONNECT</b><br/>If connection is successful<br/><b>&lt;n&gt;, CONNECT OK</b><br/>Otherwise<br/><b>&lt;n&gt;, CONNECT FAIL</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b>            0..5    A numeric parameter which indicates the connection number</p> <p><b>&lt;mode&gt;</b>       A string parameter which indicates the connection type<br/>                  "TCP"        Establish a TCP connection<br/>                  "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> <ul style="list-style-type: none"> <li>0 IP INITIAL</li> <li>1 IP START</li> <li>2 IP CONFIG</li> <li>3 IP GPRSACT</li> <li>4 IP STATUS</li> <li>5 TCP CONNECTING/UDP CONNECTING/</li> <li>SERVER LISTENING</li> <li>6 CONNECT OK</li> <li>7 TCP CLOSING/UDP CLOSING</li> <li>8 TCP CLOSED/UDP CLOSED</li> <li>9 PDP DEACT</li> </ul> <p>In Multi-IP state:</p> <ul style="list-style-type: none"> <li>0 IP INITIAL</li> <li>1 IP START</li> <li>2 IP CONFIG</li> <li>3 IP GPRSACT</li> <li>4 IP STATUS</li> <li>5 IP PROCESSING</li> <li>9 PDP DEACT</li> </ul> |
| 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 or IP_CLOSED when it is in single state. In multi-IP state, the state is in IP_STATUS only, or, if the module is deactivating. 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>  |

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

| AT+CIPSEND Send Data Through TCP or UDP Connection |  |
|--|--|
| Test Command                                       | Response   |
| AT+CIPSEND=?                                       | <p>1) For single IP connection (+CIPMUX=0)</p> <p>+CIPSEND: &lt;length&gt;</p> |



|  |   |
|--|---|
|  | <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)<br/><b>+CIPSEND: (0-5),&lt;length&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| <p>Read Command<br/><b>AT+CIPSEND?</b></p>   | <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</p> <p><b>&lt;n&gt;</b> A numeric parameter which indicates the connection number</p> <p><b>&lt;size&gt;</b> A numeric parameter which indicates the data length sent at a time.<br/>The value of &lt;size&gt; is 1460 if the connection is successful, otherwise &lt;size&gt; is 0.</p>   |
| <p>Write Command</p> <p>1) If single IP connection<br/>(+CIPMUX=0)<br/><b>AT+CIPSEND=&lt;length&gt;</b></p> <p>2) If multi IP connection<br/>(+CIPMUX=1)<br/><b>AT+CIPSEND=&lt;n&gt;,&lt;length&gt;</b><br/>response"&gt;", then<br/>tap data for send</p> | <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</p> |

|   |  |
|---|--|
|   | <p><b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b></p> <p>If sending fails:<br/><b>&lt;n&gt;,&lt;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</p> <p>Command</p> <p>1)If single IP connection (+CIPMUX=0)<br/><b>AT+CIPSEND</b></p> <p>2)If multi IP connection (+CIPMUX=1)<br/><b>AT+CIPSEND=&lt;n&gt;</b></p> <p>response"&gt;", then tap data for send, tap CTRL+Z to send, tap ESC to cancel the 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)<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></p> <p>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;n&gt;,&lt;err&gt;</b></p> <p>If sending is successful:<br/>When +CIPQSEND=0<br/><b>&lt;n&gt;,&lt;SEND OK</b></p> <p>When +CIPQSEND=1<br/><b>DATA ACCEPT: &lt;n&gt;,&lt;length&gt;</b></p> <p>If sending fails:<br/><b>&lt;n&gt;,&lt;SEND FAIL</b></p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | When +CIPQSEND=0 and the remote server no response, after 645 seconds, "CLOSE" will be reported.   |
| Reference   | <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>  |

## 6.2.4 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 by module, it will respond DATA ACCEPT: <n>,<length>, while not responding SEND OK. |
| Parameter Saving Mode                         | NO_SAVE  |
| Max Response Time                             | -  |
| Reference                                     | Note   |

## 6.2.5 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<br>(+CIPMUX=0)<br><b>AT+CIPACK</b> | <b>+CIPACK: &lt;txlen&gt;,&lt;acklen&gt;,&lt;nacklen&gt;</b><br><br><b>OK</b> |
|   | Parameters<br>See Write Command   |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

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

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

### 6.2.7 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> |

### 6.2.8 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: (0-5),("TCP","UDP"),(0-65535)</b></p> <p><b>OK</b></p> |

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

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

| <b>AT+CSTT Start Task and Set APN, USER NAME, PASSWORD</b> |   |
|--|---|
| Test Command<br><b>AT+CSTT=?</b>                           | <p>Response</p> <p><b>+CSTT: "APN","USER","PWD"</b></p> |

|  |   |
|--|---|
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CSTT?</b>  | Response<br><b>+CSTT: &lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;</b>  |
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CSTT=&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;</b> | Response<br><b>OK</b><br>If set fail<br><b>ERROR</b>  |
|  | Parameters<br><b>&lt;apn&gt;</b> A string parameter which indicates the GPRS access point name. The max length is 32 bytes.Default value is "ctnb".(option)<br><b>&lt;user name&gt;</b> A string parameter which indicates the GPRS user name. The max length is 32 bytes.(option)<br><b>&lt;password&gt;</b> A string parameter which indicates the GPRS password. The max length is 32 bytes.(option) |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Execution Command<br><b>AT+CSTT</b>  | Response<br><b>OK</b><br><b>ERROR</b>   |
| 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.  |

#### 6.2.10 AT+CIICR Bring Up Wireless Connection with GPRS or CSD

| <b>AT+CIICR Bring Up Wireless Connection with GPRS or CSD</b> |   |
|---|---|
| Test Command<br><b>AT+CIICR=?</b>                             | Response<br><b>OK</b>                                     |
| Execution Command<br><b>AT+CIICR</b>                          | Response<br><b>OK</b><br>If bring up fail<br><b>ERROR</b> |
| 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> |

### 6.2.11 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> | <p>Response<br/><b>&lt;IP address&gt;</b><br/>If get fail<br/><b>ERROR</b></p> <p>Parameter<br/><b>&lt;IP address&gt;</b> A string parameter which indicates the IP address assigned from GPRS or CSD.</p>   |
| 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:<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 &lt;state&gt; parameter);<br/>IP STATUS, IP PROCESSING in multi-connection mode (see &lt;state&gt; parameter).</p> |

### 6.2.12 AT+CIPSTATUS Query Current Connection Status

| AT+CIPSTATUS Query Current Connection Status |                       |
|--|-----------------------|
| Test Command<br><b>AT+CIPSTATUS</b>          | Response<br><b>OK</b> |



|  |  |
|--|--|
| =?   |  |
| Write Command<br>If multi IP<br>connection mode<br>(+CIPMUX=1)<br><b>AT+CIPSTATU</b><br><b>S=&lt;n&gt;</b> | <p>Response</p> <p><b>+CIPSTATUS: &lt;n&gt;,&lt;bearer&gt;,&lt;TCP/UDP&gt;,&lt;IP address&gt;,&lt;port&gt;,&lt;client state&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Execution Command</p>  |
| Execution<br>Command<br><b>AT+CIPSTATUS</b>  | <p>Response</p> <p>1) If in single connection mode (+CIPMUX=0)</p> <p><b>OK</b></p> <p><b>STATE: &lt;state&gt;</b></p> <p>2) If in multi-connection mode (+CIPMUX=1)</p> <p><b>OK</b></p> <p><b>STATE: &lt;state&gt;</b></p> <p>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>If the module is set as client</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>        0-5 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</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     | -   |
| Reference             | Note  |

## 6.2.13 AT+CDNSCFG Configure Domain Name Server

| AT+CDNSCFG Configure Domain Name Server                              |  |
|--|--|
| Test Command<br><b>AT+CDNSCFG=?</b>                                  | <p>Response</p> <p><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</p> <p><b>PrimaryDns: &lt;pri_dns&gt;</b></p> <p><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</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;pri_dns&gt;</b> A string parameter which indicates the IP address of the primary domain name server. Default value is 208.67.222.222.</p> <p><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> <p>When you are on the network, &lt;pri_dns&gt;&lt;sec_dns&gt; will use the DNS server address from the network, and the default DNS server address if the</p> |

|                       |                 |
|-----------------------|-----------------|
|                       | network is not. |
| Parameter Saving Mode | NO_SAVE         |
| Max Response Time     | -               |
| Reference             | Note            |

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

#### 6.2.15 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   | Response |

|                                    |   |
|------------------------------------|---|
| AT+CIPHEAD=?                       | +CIPHEAD: (list of supported <mode>s)   |
|                                    | OK  |
| Read Command<br>AT+CIPHEAD?        | Parameter<br>See Write Command  |
|                                    | Response<br>+CIPHEAD: <mode>  |
| Write Command<br>AT+CIPHEAD=<mode> | OK  |
|                                    | or<br>ERROR   |
|                                    | Parameters<br><mode>      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:<br>1) For single IP connection (+CIPMUX=0)<br>+IPD,<data length>:<br>2) For multi IP connection (+CIPMUX=1)<br>+RECEIVE,<n>,<data length>: |
|                                    |   |
| Parameter Saving Mode              | NO_SAVE   |
| Max Response Time                  | -   |
| Reference                          | Note  |

## 6.2.16 AT+CIPHEXS Show Data in Hex Mode of a Package Received

| AT+CIPHEXS Show Data in Hex Mode of a Package Received |                                 |
|--|---------------------------------|
| Read Command<br>AT+CIPHEXS?                            | Response<br>+CIPHEXS: <mode>    |
|  | OK                              |
| Write Command<br>AT+CIPHEXS=                           | Parameters<br>See Write Command |
|  | Response<br>OK                  |

|                       |  |
|-----------------------|--|
| <mode>                | or<br><b>ERROR</b>   |
|                       | Parameters<br><mode> A numeric parameter which indicates whether show data in hex mode or not.<br>0-1 Not show data in hex mode.<br>2 Show data in hex mode.<br>for Add an IP Head at the Beginning of a Package Received:+CIPHEAD=1 if<mode>=1 or 2: add 0d0a at the end of data. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | when receive data automatically (AT+CIPRXGET=0), AT+CIPHEXS=2 is effective   |

#### 6.2.17 AT+CIFSREX Get Local IP Address

| AT+CIFSREX Get Local IP Address        |   |
|--|---|
| Test Command<br><b>AT+CIFSREX=?</b>    | Response<br><b>OK</b>   |
| Execution Command<br><b>AT+CIFSREX</b> | Response<br><b>+CIFSREX: &lt;IP address&gt;</b><br><br><b>OK</b><br>or<br><b>ERROR</b>  |
|  | Parameter<br><IP address> A string parameter which indicates the IP address assigned from GPRS or CSD.  |
| 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+CIFSREX, 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).

### 6.2.18 AT+CIPATS Set Auto Sending Timer

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

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

| AT+CIPSPRT Set Prompt of '>' When Module Sends Data |  |
|---|--|
| Test Command<br>AT+CIPSPRT=?                        | <p>Response</p> <p>+CIPSPRT: (list of supported &lt;send prompt&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> |

|  |  |
|--|--|
|  | See Write Command  |
| Read Command<br><b>AT+CIPSPRT?</b>                     | <p>Response</p> <p><b>+CIPSPRT: &lt;send prompt&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CIPSPRT=&lt;send prompt&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;send prompt&gt;</b> A numeric parameter which indicates whether to echo prompt ‘&gt;’ after module issues AT+CIPSEND command.</p> <p>0 It shows "send ok" but does not prompt echo ‘&gt;’ when sending is successful.</p> <p>1 It prompts echo ‘&gt;’ and shows "send ok" when sending is successful.</p> <p>2 It neither prompts echo ‘&gt;’ nor shows "send ok" when sending is successful.</p> |
| Parameter Saving Mode                                  | NO_SAVE  |
| Max Response Time                                      | -  |
| Reference  | Note   |

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

| <b>AT+CIPCSGP Set CSD or GPRS for Connection Mode</b> |   |
|---|---|
| Test Command<br><b>AT+CIPCSGP=?</b>                   | <p>Response</p> <p><b>+CIPCSGP: 0-CSD,DIALNUMBER,USER NAME,PASSWORD,RATE(0-3)</b></p> <p><b>+CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |
| Read Command<br><b>AT+CIPCSGP?</b>                    | <p>Response</p> <p><b>+CIPCSGP: &lt;mode&gt;,&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;[,&lt;rate&gt;]</b></p> <p><b>OK</b></p>   |

|   |  |
|---|--|
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPCSGP=&lt;mode&gt;[,&lt;apn&gt;,&lt;user name&gt;,&lt;password&gt;],(&lt;dial number&gt;,&lt;user name&gt;,&lt;password&gt;,&lt;rate&gt;)]</b> | <p>Response<br/><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;mode&gt;</b> A numeric parameter which indicates the wireless connection mode</p> <p>0 set CSD as wireless connection mode<br/>1 set GPRS as wireless connection mode</p> <p>GPRS parameters:</p> <p><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 CSD parameters:</p> <p><b>&lt;dial number&gt;</b> A string parameter which indicates the CSD dial numbers<br/><b>&lt;user name&gt;</b> A string parameter which indicates the CSD user name<br/><b>&lt;password&gt;</b> A string parameter which indicates the CSD password<br/><b>&lt;rate&gt;</b> A numeric parameter which indicates the CSD connection rate</p> <p>0 2400<br/>1 4800<br/>2 9600<br/>3 14400</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 6.2.21 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>                           | <p>Response<br/><b>+CIPSRIP: (list of supported &lt;mode&gt;s)</b><br/><br/><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Read Command<br><b>AT+CIPSRIP?</b>                            | <p>Response<br/><b>+CIPSRIP: &lt;mode&gt;</b></p>   |



|   |   |
|---|---|
|   | <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>or<br><b>ERROR</b><br>Parameters<br><mode> 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:<br>1) For single IP connection (+CIPMUX=0)<br><b>+RECV 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                                       |   |

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

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

|                       |   |
|-----------------------|---|
|                       | <p>Parameters</p> <p><b>&lt;mode&gt;</b> A numeric parameter which indicates whether to display transfer protocol in IP header to received data or not</p> <p>0 Not display transfer protocol</p> <p>1 Display transfer protocol, the format is "+IPD,&lt;data size&gt;,&lt;TCP/UDP&gt;:&lt;data&gt;"</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <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>  |

### 6.2.23 AT+CIPUDPMODE UDP Extended Mode

| AT+CIPUDPMODE UDP Extended Mode                   |   |
|---|---|
| <p>Test Command</p> <p><b>AT+CIPUDPMODE=?</b></p> | <p>Response</p> <p>1) For single IP connection (+CIPMUX=0)</p> <p><b>+CIPUDPMODE: (0-2),("0-255).(0-255).(0-255).(0-255)",(1-65535)</b></p> <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)</p> <p><b>+CIPUDPMODE: (0-5),(0-2),("0-255).(0-255).(0-255).(0-255)",(1-65535)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| <p>Read Command</p> <p><b>AT+CIPUDPMODE?</b></p>  | <p>Response</p> <p>1) For single IP connection (+CIPMUX=0)</p> <p><b>+CIPUDPMODE: &lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>OK</b></p> <p>2) For multi IP connection (+CIPMUX=1)</p> <p><b>+CIPUDPMODE: 0,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>+CIPUDPMODE: 1,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>+CIPUDPMODE: 2,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>+CIPUDPMODE: 3,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>+CIPUDPMODE: 4,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> <p><b>+CIPUDPMODE: 5,&lt;mode&gt;[,&lt;IP address&gt;,&lt;Port&gt;]</b></p> |

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

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

| <b>AT+CIPRXGET Get Data from Network Manually</b> |  |
|---|--|
| Test Command<br><b>AT+CIPRXGET</b><br><b>=?</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><br><br><b>OK</b><br><br>Parameters<br>See Write Command |
| Read Command<br><b>AT+CIPRXGET</b><br><b>?</b>    | Response<br><b>+CIPRXGET: &lt;mode&gt;</b>   |

|  |  |
|--|--|
|  | <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| <p>Write Command</p> <p>1) If single IP connection<br/>(+CIPMUX=0)</p> <p><b>AT+CIPRXGET</b><br/><b>=&lt;mode&gt;[,&lt;reqlength&gt;]</b></p> <p>2) If multi IP connection<br/>(+CIPMUX=1)</p> <p><b>AT+CIPRXGET</b><br/><b>=&lt;mode&gt;[,&lt;id&gt;,&lt;reqlength&gt;]</b></p> | <p>Response</p> <p><b>OK</b></p> <p><b>ERROR</b></p> <p>1) For single IP connection</p> <p>If “AT+CIPSRIP=1” is set, IP address and port are contained.</p> <p>if &lt;mode&gt;=1</p> <p><b>+CIPRXGET: 1[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p>if &lt;mode&gt;=2</p> <p><b>+CIPRXGET: 2,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p><b>1234567890...</b></p> <p><b>OK</b></p> <p>if &lt;mode&gt;=3</p> <p><b>+CIPRXGET: 3,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p><b>5151...</b></p> <p><b>OK</b></p> <p>if &lt;mode&gt;=4</p> <p><b>+CIPRXGET: 4,&lt;cnflength&gt;</b></p> <p><b>OK</b></p> <p>2) For multi IP connection</p> <p>If “AT+CIPSRIP=1” is set, IP address and port is contained.</p> <p>if &lt;mode&gt;=1</p> <p><b>+CIPRXGET: 1[,&lt;id&gt;,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p>if &lt;mode&gt;=2</p> <p><b>+CIPRXGET: 2,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p><b>1234567890...</b></p> <p><b>OK</b></p> <p>if &lt;mode&gt;=3</p> <p><b>+CIPRXGET: 3,&lt;id&gt;,&lt;reqlength&gt;,&lt;cnflength&gt;[,&lt;IP ADDRESS&gt;:&lt;PORT&gt;]</b></p> <p><b>5151...</b></p> <p><b>OK</b></p> <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> <ul style="list-style-type: none"> <li>0 Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly.</li> <li>1 Enable getting data from network manually.</li> <li>2 The module can get data, but the length of output data can not exceed 1460 bytes at a time.</li> <li>3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time.</li> <li>4 Query how many data are not read with a given ID.</li> </ul> <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</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>  |

### 6.2.25 AT+CIPTKA Set TCP Keepalive Parameters

| AT+CIPTKA Set TCP Keepalive Parameters |   |
|--|---|
| Test Command<br><b>AT+CIPTKA=?</b>     | <p>Response</p> <p>If single IP connection (+CIPMUX=0)<br/> <b>+CIPTKA:</b> (list of supported &lt;mode&gt;s),(list of supported &lt;keepIdle&gt;s),(list of supported &lt;keepInterval&gt;),(list of supported &lt;keepCount&gt;s)</p> <p>If multi IP connection (+CIPMUX=1)<br/> <b>+CIPTKA:</b> (list of supported &lt;id&gt;s),(list of supported &lt;mode&gt;s),(list of supported &lt;keepIdle&gt;s),(list of supported &lt;keepInterval&gt;),(list of supported &lt;keepCount&gt;s)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Read Command<br><b>AT+CIPTKA?</b>      | <p>Response</p> <p>If single IP connection (+CIPMUX=0)<br/> <b>+CIPTKA:</b> &lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</p> <p>If multi IP connection (+CIPMUX=1)<br/> <b>+CIPTKA:</b> 0,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]<br/> <b>+CIPTKA:</b> 1,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</p>  |

|  |   |
|--|---|
|  | <b>+CIPTKA: 2,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b><br><b>+CIPTKA: 3,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b><br><b>+CIPTKA: 4,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b><br><b>+CIPTKA: 5,&lt;mode&gt;[,&lt;keepIdle&gt;,&lt;keepInterval&gt;,&lt;keepCount&gt;]</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CIPTKA=&lt;mode&gt;[,&lt;keepIdle&gt;[,&lt;keepInterval&gt;[,&lt;keepCount&gt;]]]</b> | Response<br><b>OK</b><br>If error is related to ME functionality:<br><b>ERROR</b><br><br>Parameters<br><b>&lt;mode&gt;</b> Set TCP keepalive option.<br>0 Disable TCP keep alive mechanism<br>1 Enable TCP keep alive mechanism<br><b>&lt;keepIdle&gt;</b> Integer type; Idle time (in second) before TCP send the initial keepalive probe.<br>30-7200 Default: 7200<br><b>&lt;keepInterval&gt;</b> Interval time (in second) between keepalive probes retransmission.<br>30-600 Default: 75<br><b>&lt;keepCount&gt;</b> Integer type; Maximum number of keepalive probes to be sent.<br>1-9 Default: 9 |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note<br>If <keepIdle>, <keepInterval> and <keepCount> is not set, module will use the default values when <mode>=1.   |

## 6.2.26 AT+CIPMODE Open Transparent Mode

| AT+CIPMODE                          | Open Transparent 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>                  | <p>Response<br/><b>+CIPMODE: &lt;mode&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Execution Command<br><b>AT+CIPMODE=&lt;mode&gt;</b> | <p>Response<br/><b>OK</b><br/>If set fail<br/><b>ERROR</b></p> <p>Parameters<br/><b>&lt;mode&gt;</b>    Transparent mode<br/>              0    Disable transparent mode<br/>              1    Enable transparent mode</p>                                  |
| Parameter Saving Mode                               | NO_SAVE  |
| Max Response Time                                   | -  |
| Reference   | <ul style="list-style-type: none"> <li>● The execution command of this command is valid only activates moving scene at the status of IP_INITIAL or IP_CLOSED</li> <li>● The execution command of this command is valid only for single connection</li> </ul> |

#### 6.2.27 AT+CIPCHAN Enter Transparent Mode

| <b>AT+CIPCHAN Enter Transparent Mode</b> |   |
|--|---|
| Test Command<br><b>AT+CIPCHAN=?</b>      | <p>Response<br/><b>OK</b></p>   |
| Execution Command<br><b>AT+CIPCHAN</b>   | <p>Response<br/><b>CONNECT</b><br/>or<br/><b>ERROR</b></p> <p>Parameters<br/><b>&lt;mode&gt;</b>    Transparent mode<br/>              0    Disable transparent mode<br/>              1    Enable transparent mode</p> |
| Parameter Saving Mode                    | NO_SAVE   |
| Max Response Time                        | -   |
| Reference                                | Note  |

- This command is executed in single-connection mode.
- Before execute this command, “AT+CIPMODE=1” must be executed and the connection must be established successfully.
- When module is in transparent mode, if user tapped “+++”, module would exit transparent mode.
- When user tapped “+++” to exit transparent mode, user can execute the command of “ATO” to return transparent mode.



## 7 AT Commands for HTTP/HTTPS Client

### 7.1 Overview of AT Commands for HTTP/HTTPS Client

| Command              | Description   |
|----------------------|---|
| AT+CHTTPCREATE       | Create a HTTP/HTTPS client instance   |
| AT+CHTTPCREATEEXT    | Create a HTTP/HTTPS client instance by multi packages for a long size command |
| AT+CHTTPCON          | Establish the HTTP/HTTPS connection   |
| AT+CHTTPDISCON       | Close the HTTP/HTTPS connection   |
| AT+CHTTPDESTROY      | Destroy the HTTP/HTTPS client instance  |
| AT+CHTTPSEND         | Send HTTP/HTTPS package   |
| AT+CHTTPSENDEXT      | Send HTTP/HTTPS package by multi packages for a long size command             |
| AT+CHTTPPARA         | Set parameter for AT command of AT+CHTTPSEND                                  |
| AT+CHTTPTOFS         | Download File to Module System  |
| AT+CHTTPCLRMULCRTBUF | Clear multi create buffer of AT+CHTTPCREATEEXT                                |
| AT+CHTTPCLRMULSNDBUF | Clear multi send buffer of AT+CHTTPSENDEXT                                    |
| AT+CHTTPRESUMESEND   | Set resume send package or not when HTTP disconnected                         |
| +CHTTPNMIH           | Header of the response from host  |
| +CHTTPNMIC           | Content of the response from host   |
| +CHTTPERR            | HTTP/HTTPS client connection error indicator                                  |
| +CHTTPTOFS           | HTTP download indicate from host  |
| +CHTTPTOFSOK         | HTTP download finished indicate   |

### 7.2 Detailed Descriptions of AT Commands for HTTP/HTTPS Client

#### 7.2.1 AT+CHTTPCREATE Create a HTTP/HTTPS Client Instance

| AT+CHTTPCREATE Create a HTTP/HTTPS Client Instance |   |
|--|---|
| Read Command<br>AT+CHTTPCREATE?                    | Response<br>+CHTTPCREATE: <httpclient_id>,<state>,<host>[<CR><LF><br>+CHTTPCREATE: <httpclient_id>,<state>,<host><br>[...]]<br><br>OK |

|  |  |
|--|--|
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CHTTPCRE<br/>EATE=&lt;host&gt;[,&lt;<br/>auth_user&gt;,&lt;aut<br/>h_password&gt;</b> | <p>Response</p> <p>Create an HTTP or HTTPS client instance and set configuration. If the &lt;host&gt; is start with "https://", our device will create an HTTPS client.</p> <p><b>+CHTTPCREATE: &lt;httpclient_id&gt;</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <hr/> <p>Parameters</p> <p>&lt;host&gt; HTTP server host</p> <p>&lt;auth_user&gt; Authorization name [option]</p> <p>&lt;auth_password&gt; Authorization password [option]</p> <p>All optional parameter should be exist or not exist in one command.</p> <p>&lt;httpclient_id&gt; An indicator of HTTP client instance created by the command.</p> <p>&lt;state&gt; The create state of the httpclient_id</p> <p>1 Sucessfully</p> <p>0 Failed</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

### 7.2.2 AT+CHTTPCREATEEXT Create a HTTP/HTTPS Client Instance by Multi Packages for a Long Size Command

|  |  |
|--|--|
| <b>AT+CHTTPCREATEEXT Create a HTTP/HTTPS Client Instance by Multi Packages for a Long Size Command</b> |  |
| Read Command<br><b>AT+CHTTPCR<br/>EATEEXT?</b>   | <p>Response</p> <p><b>+CHTTPCREATEEXT: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt;</b></p> <p><b>+CHTTPCREATEEXT: &lt;httpclient_id&gt;,&lt;state&gt;,&lt;host&gt;</b></p> <p><b>[...]</b></p> <p><b>OK</b></p> <hr/> <p>Parameters</p> <p>See Write Command</p> |
| Write Command<br><b>AT+CHTTPCR</b>   | <p>Response</p> <p>Create an HTTP or HTTPS client instance and set configuration. If the</p>   |

|   |  |
|---|--|
| <b>EATEEXT=&lt;flag&gt;,&lt;total_len&gt;,&lt;len&gt;,&lt;host&gt;[&lt;auth_user&gt;,&lt;auth_password&gt;,&lt;server_cert_len&gt;,&lt;server_cert&gt;,&lt;client_cert_len&gt;,&lt;client_cert&gt;,&lt;client_pk_len&gt;,&lt;client_pk&gt;]</b> | <p>&lt;host&gt; is start with "https://", our device will create an HTTPS client.</p> <p><b>+CHTTPCREATEEXT: &lt;httpclient_id&gt;</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;flag&gt;</b> 1 means there are more packages, 0 means this package is the last one</p> <p><b>&lt;total_len&gt;</b> The total length of the command</p> <p><b>&lt;len&gt;</b> The length of current package</p> <p><b>&lt;host&gt;</b> HTTP server host</p> <p><b>&lt;auth_user&gt;</b> Authorization name [option]</p> <p><b>&lt;auth_password&gt;</b> Authorization password [option]</p> <p><b>&lt;server_cert_len&gt;</b> Server certification length, for https [option]</p> <p><b>&lt;server_cert&gt;</b> Server certification, for https [option]</p> <p><b>&lt;client_cert_len&gt;</b> Client certification length, for https [option]</p> <p><b>&lt;client_cert&gt;</b> Client certification, for https [option]</p> <p><b>&lt;client_pk_len&gt;</b> Client private key length, for https [option]</p> <p><b>&lt;client_pk&gt;</b> Client private key, for https [option]</p> <p>All optional parameter should be exist or not exist in one command.</p> <p><b>&lt;httpclient_id&gt;</b> An indicator of HTTP client instance created by the command.</p> <p><b>&lt;state&gt;</b> The create state of the httpclient_id</p> <p>1 Sucessfully</p> <p>0 Failed</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 7.2.3 AT+CHTTPCON Establish the HTTP/HTTPS Connection

| <b>AT+CHTTPCON Establish the HTTP/HTTPS Connection</b> |   |
|--|---|
| <b>Test Command</b><br><b>AT+CHTTPCON=?</b>            | <p><b>Response</b></p> <p><b>+CHTTPCON: (0-4)</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |

|   |  |
|---|--|
| <p>Read Command<br/><b>AT+CHTTPCON?</b></p>                       | <p>Response<br/><b>+CHTTPCON: &lt;httpclient_id&gt;,&lt;con_state&gt;,&lt;host&gt;[&lt;CR&gt;&lt;LF&gt;+CHTTPCON: &lt;httpclient_id&gt;,&lt;con_state&gt;,&lt;host&gt;[...]]</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| <p>Write Command<br/><b>AT+CHTTPCON=&lt;httpclient_id&gt;</b></p> | <p>Response<br/>Use the created HTTP instance to connect to target host.<br/><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters<br/><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command<br/><b>&lt;con_state&gt;</b> The connected state of the httpclient_id<br/>1 OK<br/>0 FAIL<br/><b>&lt;host&gt;</b> HTTP server host</p> |
| <p>Parameter Saving Mode</p>                                      | <p>NO_SAVE</p>   |
| <p>Max Response Time</p>  | <p>-</p>   |
| <p>Reference</p>  | <p>Note<br/>● <b>AT+CHTTPCREATE</b> should be set before this command.</p>   |

#### 7.2.4 AT+CHTTPDISCON Close the HTTP/HTTPS Connection

| <b>AT+CHTTPDISCON Close the HTTP/HTTPS Connection</b>                |   |
|--|---|
| <p>Test Command<br/><b>AT+CHTTPDISCON=?</b></p>                      | <p>Response<br/><b>+CHTTPDISCON: (0-4)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| <p>Write Command<br/><b>AT+CHTTPDISCON=&lt;httpclient_id&gt;</b></p> | <p>Response<br/>Use the created HTTP instance to disconnect the connection with host. After disconnected and before destroy the HTTP instance, you can use AT+CHTTPCON to connect it again.<br/><b>OK</b><br/>or<br/><b>ERROR</b></p> |

|                       |  |
|-----------------------|--|
|                       | Parameters<br><httpclient_id> The indicator of HTTP client instance created by the AT+CHTTPCREATE command. |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note<br>● AT+CHTTPCON should be set before this command  |

### 7.2.5 AT+CHTTPDESTROY Destroy the HTTP/HTTPS Client Instance

| AT+CHTTPDESTROY Destroy the HTTP/HTTPS Client Instance |  |
|--|--|
| Test Command<br>AT+CHTTPDESTROY=?                      | Response<br>+CHTTPDESTROY: (0-4)<br><br>OK<br><br>Parameters<br>See Write Command  |
| Read Command<br>AT+CHTTPDESTROY?                       | Response<br>+CHTTPDESTROY: <httpclient_id>,<state>,<host>[<CR><LF><br>+CHTTPDESTROY: <httpclient_id>,<state>,<host><br>[...]]<br><br>OK<br><br>Parameters<br>See Write Command   |
| Write Command<br>AT+CHTTPDESTROY=<httpclient_id>       | Response<br>Use the created HTTP instance to disconnect the connection with host.<br>OK<br>or<br>ERROR<br><br>Parameters<br><httpclient_id> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.<br><state> The create state of the httpclient_id<br>1 Successfully<br>0 Failed<br><host> HTTP server host |
| Parameter Saving Mode                                  | NO_SAVE  |
| Max Response   | -  |

|           |  |
|-----------|--|
| Time      |  |
| Reference | Note <ul style="list-style-type: none"> <li>● <b>AT+CHTTPCREATE</b> should be set before this command</li> </ul> |

### 7.2.6 AT+CHTTPSEND Send HTTP/HTTPS Package

| AT+CHTTPSEND Send HTTP/HTTPS Package  |  |
|---|--|
| Test Command<br><b>AT+CHTTPSEND=?</b>   | Response<br><b>+CHTTPSEND: (0-4),(0-3),"path","http header","http content type","http content"</b><br><br><b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CHTTPSEND=&lt;httpclient_id&gt;,&lt;method&gt;,&lt;path&gt;,&lt;customer_header&gt;,&lt;content_type&gt;,&lt;content_string&gt;]</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
|   | Parameters<br><p><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.</p> <p><b>&lt;method&gt;</b> HTTP method</p> <p>0 HTTPCLIENT_GET<br/>1 HTTPCLIENT_POST<br/>2 HTTPCLIENT_PUT<br/>3 HTTPCLIENT_DELETE</p> <p><b>&lt;path&gt;</b> The resource path on server, ex. "/html/login/index.html" means the url full path is "&lt;host&gt;/html/login/index.html".</p> <p><b>&lt;customer_header&gt;</b> The string converted from customer header hex data.</p> <p><b>&lt;content_type&gt;</b> A string indicate the content type of the content, if the method is not POST and PUT, it must be empty.</p> <p><b>&lt;content_string&gt;</b> The string converted from content hex data.</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note <ul style="list-style-type: none"> <li>● <b>AT+CHTTPCON</b> should be set before this command</li> </ul>  |

## 7.2.7 AT+CHTTPSENDEXT Send HTTP/HTTPS Package by Multi Packages for a Long Size Command

### AT+CHTTPSENDEXT Send HTTP/HTTPS Package by Multi Packages for a Long Size Command

|   |  |
|---|--|
| Test Command<br><b>AT+CHTTPSENDEXT=?</b>  | Response<br><b>+CHTTPSENDEXT:</b><br><b>(0-1),"total_len","current_len",(0-4),(0-3),"path_len","path","header_len","header","content_type_len","content_type","content_string_len","content_string"</b><br><br><b>OK</b>   |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CHTTPSENDEXT=&lt;flag&gt;,&lt;total_len&gt;,&lt;len&gt;,&lt;httpclient_id&gt;,&lt;method&gt;,&lt;path_len&gt;,&lt;path&gt;,&lt;customer_header_len&gt;,&lt;customer_header&gt;,&lt;content_type_len&gt;,&lt;content_type&gt;,&lt;content_string_len&gt;,&lt;content_string&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
|   | Parameters<br><b>&lt;flag&gt;</b><br>1 means there are more packages<br>0 means this package is the last one<br><b>&lt;total_len&gt;</b> The total length of the command<br><b>&lt;len&gt;</b> The length of current package<br><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.<br><b>&lt;method&gt;</b> HTTP method<br>0 HTTPCLIENT_GET<br>1 HTTPCLIENT_POST<br>2 HTTPCLIENT_PUT<br>3 HTTPCLIENT_DELETE<br><b>&lt;path_len&gt;</b> length of path<br><b>&lt;path&gt;</b> The resource path on server, ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html".<br><b>&lt;customer_header_len&gt;</b> Length of customer_header<br><b>&lt;customer_header&gt;</b> The string converted from customer header hex data.<br><b>&lt;content_type_len&gt;</b> The length of Content_type<br><b>&lt;content_type&gt;</b> A string indicate the content type of the content, if the method is not POST and PUT, it must be empty.<br><b>&lt;content_string_len&gt;</b> The length of Content_string<br><b>&lt;content_string&gt;</b> The string converted from content hex data. |
| Parameter Saving  | NO_SAVE  |

|                   |   |
|-------------------|---|
| Mode              |   |
| Max Response Time | -   |
| Reference         | Note <ul style="list-style-type: none"> <li>● <b>AT+CHTTPCON</b> should be set before this command</li> </ul> |

### 7.2.8 AT+CHTTPPARA Set Parmeter for AT Command of AT+CHTTPSEND

| <b>AT+CHTTPPARA Set Parmeter for AT Command of AT+CHTTPSEND</b> |  |
|---|--|
| Test Command<br><b>AT+CHTTPPARA=?</b>                           | Response<br><b>+CHTTPPARA: (0-1)</b><br><br><b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Read Command<br><b>AT+CHTTPPARA?</b>                            | Response<br><b>+CHTTPPARA: &lt;value&gt;</b><br><br><b>OK</b>  |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+CHTTPPARA=&lt;value&gt;</b>              | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
|   | Parameters<br><b>&lt;value&gt;</b> The parameter for sending<br>1 Can send <b>AT+CHTTPSEND</b> continuously<br>0 Can not send <b>AT+CHTTPSEND</b> continuously, until the server reponse |
| Parameter Saving Mode   | AUTO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note<br>Use this command for setting send parameter, so that you can send "AT+CHTTPSEND" continuously, and no care of the response.  |

### 7.2.9 AT+CHTTPTOFS Download File to Module System

| <b>AT+CHTTPTOFS Download File to Module System</b> |   |
|--|---|
| Test Command<br><b>AT+CHTTPTOF</b>                 | Response<br><b>+CHTTPCON: (0-4), "path"</b> |



|   |   |
|---|---|
| <b>S=?</b>  | <b>OK</b>   |
|   | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CHTTPTOF</b><br><b>S=&lt;httpclient_id</b><br><b>&gt;,&lt;path&gt;</b> | Response<br>Use the created HTTP instance to connect to target host.<br><b>OK</b><br>or<br><b>ERROR</b><br>Parameters<br><httpclient_id> The indicator of HTTP client instance created by the AT+CHTTPCREATE command<br><path> The resource path on server, it should begin with "/". ex. "/html/login/index.html" means the url full path is "<host>/html/login/index.html". |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note<br>● <b>AT+CHTTPCON</b> should be set before this command.   |

#### 7.2.10 AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT

| <b>AT+CHTTPCLRMULCRTBUF Clear Multi Create Buffer of AT+CHTTPCREATEEXT</b> |  |
|--|--|
| Execution Command<br><b>AT+CHTTPCLRMULCRTBUF</b>                           | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note<br>Clear multi create buffer of AT+CHTTPCREATEEXT<br>When you do not AT+CHTTPCREATEEXT the last package, but you want to AT+CHTTPCREATEEXT the new command, you can AT+CHTTPCLRMULCRTBUF. |

## 7.2.11 AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT

| AT+CHTTPCLRMULSNDBUF Clear Multi Send Buffer of AT+CHTTPSENDEXT |  |
|---|--|
| Execution Command<br><b>AT+CHTTPCLRMULSNDBUF</b>                | Response<br><b>OK</b><br>or<br><b>ERROR</b>  |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note<br>Clear multi send buffer of AT+CHTTPSENDEXT<br>When you do not AT+CHTTPSENDEXT the last package, but you want to AT+CHTTPSENDEXT the new command, you can AT+CHTTPCLRMULSNDBUF. |

## 7.2.12 AT+CHTTPRESUMESEND Set Resume Send Package or not when HTTP Disconnected

| AT+CHTTPRESUMESEND Set Resume Send Package or not when HTTP Disconnected |   |
|--|---|
| Test Command<br><b>AT+CHTTPRESUMESEND=?</b>                              | Response<br><b>+CHTTPRESUMESEND: (0-1)</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Read Command<br><b>AT+CHTTPRESUMESEND?</b>                               | Response<br><b>+CHTTPRESUMESEND: &lt;value&gt;</b><br><br><b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+CHTTPRESUMESEND=&lt;value&gt;</b>                 | Response<br><b>OK</b><br>or<br><b>ERROR</b>   |
|  | Parameters<br><b>&lt;value&gt;</b> Resume send package or not when HTTP disconnected.<br>1 Can resume send packages by AT+CHTTPSENDEXT when HTTP disconnected<br>0 Can not resume send packages by AT+CHTTPSENDEXT when |

|                       |   |
|-----------------------|---|
|                       | HTTP disconnected. Once HTTP disconnected, multi send buffer of AT+CHTTPSENDEXT is cleared automatically, you should always AT+CHTTPSENDEXT the first package |
| Parameter Saving Mode | AUTO_SAVE   |
| Max Response Time     | -   |
| Reference             |   |

### 7.2.13 +CHTTPNMIH Header of the Response from Host

| +CHTTPNMIH Header of the Response from Host |   |
|---|---|
|   | <p>Response</p> <p>The response from host has 2 parts. This is the header part and content part will follow this URC.</p> <p><b>+CHTTPNMIH:</b></p> <p><b>&lt;httpclient_id&gt;,&lt;response_code&gt;,&lt;header_length&gt;,&lt;header&gt;</b></p> <p>Parameters</p> <p><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.</p> <p><b>&lt;response_code&gt;</b> The HTTP response code</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  
 407 Proxy Authentication Required  
 408 Request Time-out  
 409 Conflict  
 410 Gone  
 411 Length Required  
 412 Precondition Failed  
 413 Request Entity Too Large  
 414 Request-URI Too Large  
 415 Unsupported Media Type  
 416 Requested range not satisfiable  
 417 Expectation Failed  
 500 Internal Server Error  
 501 Not Implemented  
 502 Bad Gateway  
 503 Service Unavailable  
 504 Gateway Time-out  
 505 HTTP Version not supported

<header\_length> The length (buffer size) of the header string

<header> Header data of response

#### 7.2.14 +CHTTPNMIC Content of The Response from Host

##### +CHTTPNMIC Content of The Response from Host

###### Response

The response from host has 2 parts. This is the content part and follows by the header part URC. And there are multi content URC follow one header URC.

###### +CHTTPNMIC:

<httpclient\_id>,<flag>,<total\_length><content\_package\_len>,<content\_package\_string>

###### Parameters

<httpclient\_id> The indicator of HTTP client instance created by the AT+CHTTPCREATE command.

<flag> The flag to indicate if there are more data of the HTTP content.

1 Means there are more packages

0 Means this package is the last one

<total\_length> The total length of the content. It is get from header "Content-Length : xxx", so if the response is not 200 OK, maybe the value is -1.

<content\_package\_len> Content data length of current URC.

<content\_package\_string> Content data string which is converted from content hex data. The length must be original content hex data size \* 2.

## 7.2.15 +CHTTPERR HTTP Client Connection Error Indicator

| +CHTTPERR HTTP Client Connection Error Indicator |   |
|--|---|
|  | <p>Response</p> <p>When the URC send, there is some error happen on the HTTP client.<br/>Normally is TCP connection is disconnected.</p> <p><b>+CHTTPERR: &lt;httpclient_id&gt;[,&lt;error_code&gt;]</b></p>  |
|  | <p>Parameters</p> <p><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command</p> <p><b>&lt;error_code&gt;</b></p> <ul style="list-style-type: none"> <li>-1 Means disconnected</li> <li>-2 Connection was closed by a remote host.</li> <li>-3 An unknown error occurred.</li> <li>-4 A protocol error occurred.</li> <li>-5 Could not resolve the hostname.</li> <li>-6 A URL parse error occurred.</li> </ul> <p>If the URC send out, the HTTP client will be disconnected automatically.<br/>If user want to send HTTP message to server, he must use AT+CHTTPCON command to connect.</p> |

## 7.2.16 +CHTTPTOFS HTTP Download Indicate from Host

| +CHTTPTOFS HTTP Download Indicate from Host |   |
|---|---|
|   | <p>Response</p> <p>HTTP download progress indicate</p> <p><b>+CHTTPTOFS: &lt;httpclient_id&gt;,&lt;flag&gt;,&lt;content_len&gt;,&lt;len&gt;</b></p>   |
|   | <p>Parameters</p> <p><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the AT+CHTTPCREATE command</p> <p><b>&lt;flag&gt;</b> The flag to indicate if there are more data of the HTTP content</p> <ul style="list-style-type: none"> <li>1 Means there are more packages</li> <li>0 Means this package is the last one</li> </ul> <p><b>&lt;content_len&gt;</b> Total length of content data</p> <p><b>&lt;len&gt;</b> The length of all downloaded content data</p> |

## 7.2.17 +CHTTPTOFSOK HTTP Download Finished Indicate

| +CHTTPTOFSOK HTTP Download Finished Indicate |  |
|--|--|
|  | <p>Response</p> <p><b>+CHTTPTOFSOK: &lt;httpclient_id&gt;,&lt;content_len&gt;,&lt;len&gt;</b></p>          |
|  | <p>Parameters</p> <p><b>&lt;httpclient_id&gt;</b> The indicator of HTTP client instance created by the</p> |

AT+HTTPCREATE command

<content\_len> Total length of content data

<len> The length of all downloaded content data

SIMCOM CONFIDENTIAL FILE

## 8 AT Commands for PING Support

### 8.1 Overview of AT Commands for PING Support

| Command    | Description                                   |
|------------|---|
| AT+CIPPING | Test IP network connectivity to a remote host |

### 8.2 Detailed Descriptions of AT Commands for PING Support

#### 8.2.1 AT+CIPPING Test IP Network Connectivity to A Remote Host

| AT+CIPPING Test IP Network Connectivity to A Remote Host                  |   |
|---|---|
| Test Command<br>AT+CIPPING=?  | <p>Response</p> <p><b>+CIPPING:</b> (list of supported &lt;retryNum&gt;s),(list of supported &lt;dataLen&gt;s),(list of supported &lt;timeout&gt;s)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+CIPPING?   | <p>Response</p> <p><b>+CIPPING:</b> &lt;retryNum&gt;,&lt;dataLen&gt;,&lt;timeout&gt;</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>AT+CIPPING=<IPAddr>[,<retryNum>[,<dataLen>[,<timeout>]]] | <p>Response</p> <p><b>OK</b></p> <p><b>+CIPPING:</b> &lt;replyId&gt;,&lt;Ip Address&gt;,&lt;replyTime&gt;,&lt;ttl&gt;[&lt;CR&gt;&lt;LF&gt;</p> <p><b>+CIPPING:</b> &lt;replyId&gt;,&lt;Ip Address&gt;,&lt;replyTime&gt;,&lt;ttl&gt;</p> <p>[...]]</p> <p>or</p> <p><b>BUSY</b> ( When previous comand unfinished, AT+CIPPING agian)</p> <p>or</p> <p><b>ERROR</b></p> <p>or</p> <p><b>+CME ERROR:</b> &lt;err&gt;</p> <p>Parameters</p> <p>&lt;IPAddr&gt; IP address of the remote host,string type.</p> <p>&lt;retryNum&gt; The number of Ping Echo Requeset to send</p> |

|                       |   |
|-----------------------|---|
|                       | <p>1-100 Default: 4</p> <p><b>&lt;dataLen&gt;</b> The length of Ping Echo Request data</p> <p>0-1024 Default: 32</p> <p><b>&lt;timeout&gt;</b> The timeout,in units of 100 ms,waiting for a single Echo Reply</p> <p>1-600 Default: 100(10 seconds)</p> <p><b>&lt;replyId&gt;</b> Echo Reply number</p> <p><b>&lt;IP Address&gt;</b> IP Address of the remote host</p> <p><b>&lt;replyTime&gt;</b> Time,in units of 100 ms, required to receive the Response</p> <p><b>&lt;ttl&gt;</b> Time to live</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>● Before sending PING Request the PDP 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 100(default timeout)</li> </ul>  |



## 9 AT Commands for Network Command – LwM2M

### 9.1 Overview of AT Commands for Network Command – LwM2M

| Command       | Description  |
|---------------|--|
| AT+CLMCONF    | Configuration LwM2M instance and create the connection |
| AT+CLMADDOBJ  | Add LwM2M object                                       |
| AT+CLMDELOBJ  | Delete LwM2M object                                    |
| AT+CLMREAD    | Read notification and command                          |
| AT+CLMWRITE   | Write notification and command                         |
| AT+CLMEXECUTE | Execute notification and command                       |
| AT+CLMNOTIFY  | Notify data change                                     |
| AT+CLMDEL     | Delete LwM2M instance                                  |
| +CLMOBSERVE   | Observed command                                       |
| +CLMPARAMETER | Observed command                                       |
| +CLMERR       | Indicated there is some error                          |

### 9.2 Detailed Descriptions of AT Commands for Network Command – LwM2M

#### 9.2.1 AT+CLMCONF Configure LwM2M Instance and Create the Connection

| AT+CLMCONF Configure LwM2M Instance and Create the Connection   |   |
|---|---|
| Write Command<br>AT+CLMCONF<br>=<ip_addr>,<port>,<local_port>,<name>,<domain>,<lifetime>,<pskid>,<psk>] | <p>Response</p> <p>+CLMCONF: &lt;lwm2m_id&gt;</p> <p>OK</p> <p>Parameters</p> <p>&lt;ip_addr&gt; String, LwM2M server IP address.</p> <p>&lt;port&gt; Integer, LwM2M server port.</p> <p>&lt;local_port&gt; Integer, local port.</p> <p>&lt;name&gt; String, Username for show in server.</p> <p>&lt;domain&gt; String, specifies the type of packet data protocol :</p> <p>IPv4 Internet Protocol (IETF STD 5)</p> <p>IPv6 Internet Protocol, version 6 (IETF RFC 2460).</p> <p>&lt;lifetime&gt; Integer, lifetime to register LwM2M server. The unit is second.</p> <p>&lt;pskid&gt; String, Mandatory for DTLS register.</p> <p>&lt;psk&gt; String, Mandatory for DTLS register.</p> |
| Parameter Saving  | NO_SAVE   |

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

### 9.2.2 AT+CLMADDOBJ Add LwM2M Object

| <b>AT+CLMADDOBJ Add LwM2M Object</b>  |  |
|---|--|
| <b>Write Command</b><br><b>AT+CLMADDOBJ=&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_count&gt;,&lt;resource_id&gt;,&lt;resource_id&gt;,...</b> | <b>Response</b><br><b>OK</b>   |
|   | Parameters<br><lwm2m_id> Integer, LwM2M id, AT+CLMCONF's response.<br><object_id> Integer, object id.<br><instance_id> Integer, instance id<br><resource_count> Integer, resource count.<br><resource_id> Integer, resource id |
| <b>Parameter Saving Mode</b>  | NO_SAVE  |
| <b>Max Response Time</b>  | -  |
| <b>Reference</b>  | Note <ul style="list-style-type: none"> <li>● AT+CLMCONF should be set before this command.</li> </ul>   |

### 9.2.3 AT+CLMDELOBJ Delete LwM2M Object

| AT+CLMDELOBJ Delete LwM2M Object  |   |
|---|---|
| Write Command<br><b>AT+CLMDELOBJ=&lt;lwm2m_id&gt;,&lt;object_id&gt;</b> | Response<br><b>OK</b>   |
|   | Parameters<br><b>&lt;lwm2m_id&gt;</b> Integer, LwM2M id, AT+CLMCONF's response.<br><b>&lt;object_id&gt;</b> Integer, object id. |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note <ul style="list-style-type: none"> <li>● AT+CLMADDOBJ should be set before this command.</li> </ul>                        |

#### 9.2.4 AT+CLMREAD Read Notification and Command

### AT+CLMREAD Read Notification and Command

|  |   |
|--|---|
| Write Command<br><b>AT+CLMREAD</b><br>= <b>&lt;lwm2m_id&gt;</b> , <b>&lt;object_id&gt;</b> , <b>&lt;instance_id&gt;</b> , <b>&lt;resource_cnt&gt;</b> , <b>&lt;resource_id&gt;</b> , <b>&lt;value_type&gt;</b><br>, <b>&lt;len&gt;</b> , <b>&lt;value&gt;</b> ,<br><b>&lt;resource_id&gt;</b> , <b>&lt;value_type&gt;</b> , <b>&lt;len&gt;</b><br>, <b>&lt;value&gt;</b> , <b>&lt;resource_id&gt;</b> , <b>&lt;value_type&gt;</b> , <b>&lt;len&gt;</b> , <b>&lt;value&gt;</b> ,...<br> | Response<br>This command used to indicated there is received a read operation. And then using this command to send the read operation result.<br><b>OK</b><br><br><b>+CLMREAD:</b><br><b>&lt;lwm2m_id&gt;</b> , <b>&lt;object_id&gt;</b> , <b>&lt;instance_id&gt;</b> , <b>&lt;count&gt;</b> , <b>&lt;resource_id&gt;</b> , <b>&lt;resource_id&gt;</b><br><br>Parameters<br><b>&lt;lwm2m_id&gt;</b> Integer, LwM2M id, AT+CLMCONF's response.<br><b>&lt;object_id&gt;</b> Integer, object id.<br><b>&lt;instance_id&gt;</b> Integer, instance id.<br><b>&lt;resource_cnt&gt;</b> Integer, if it is 0, means all readable resources of the instance.<br><b>&lt;resource_id&gt;</b> Integer, if count is 0, the resource id is not exist.<br><b>&lt;value_type&gt;</b> Char, value type.<br>I     Integer<br>F     Float<br>B     Boolean<br>D     UINT8 array data<br>S     String<br><b>&lt;len&gt;</b> Integer, value length.<br><b>&lt;value&gt;</b> Value type, value context. |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  | Note  |

### 9.2.5 AT+CLMWRITE Write Notification and Command

| AT+CLMWRITE    Write Notification and Command                            |   |
|--|---|
| Write Command  | Response  |
| <b>AT+CLMWRI</b><br><b>E=&lt;lwm2m_id&gt;</b> ,<br><b>&lt;result&gt;</b> | <p>This command used to indicated there is received a write operation. And then using this command to send the write operation result.</p> <p><b>OK</b></p> <p><b>+CLMWRITE:</b><br/> <b>&lt;lwm2m_id&gt;</b>,<b>&lt;object_id&gt;</b>,<b>&lt;instance_id&gt;</b>,<b>&lt;resource_cnt&gt;</b>,<b>&lt;resource_id&gt;</b><br/> <b>,&lt;value_type&gt;</b>,<b>&lt;len&gt;</b>,<b>&lt;value&gt;</b>,<b>&lt;resource_id&gt;</b>,<b>&lt;value_type&gt;</b>,<b>&lt;len&gt;</b>,<b>&lt;value&gt;</b><br/> <b>&gt;</b>,<b>&lt;resource_id&gt;</b>,<b>&lt;value_type&gt;</b>,<b>&lt;len&gt;</b>,<b>&lt;value&gt;</b>,...</p> |
|  | Parameters  |

|                       |  |
|-----------------------|--|
|                       | <p><b>&lt;lwm2m_id&gt;</b> Integer, LwM2M id, AT+CLMCONF's response.</p> <p><b>&lt;result&gt;</b> Integer, write result, result of write command, error code.</p> <p>0 Success,</p> <p>Other value is error code in Spec.</p> <p><b>&lt;object_id&gt;</b> Integer, object id.</p> <p><b>&lt;instance_id&gt;</b> Integer, instance id.</p> <p><b>&lt;resource_cnt&gt;</b> Integer, if resource_id == -1, there will be set count.</p> <p><b>&lt;resource_id&gt;</b> Integer, resource id.</p> <p>-1 All of resource about the instance.</p> <p><b>&lt;value_type&gt;</b> Char, value type.</p> <p>I Integer</p> <p>F Float</p> <p>B Boolean</p> <p>D UINT8 array data</p> <p>S String</p> <p><b>&lt;len&gt;</b> Integer, value length.</p> <p><b>&lt;value&gt;</b> Value type, value context.</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

## 9.2.6 AT+CLMEXECUTE Execute Notification and Command

| AT+CLMEXECUTE Execute Notification and Command     |   |
|--|---|
| Write Command<br>AT+CLMEXECUTE=<lwm2m_id>,<result> | <p>Response</p> <p>This command used to indicated there is received a execute operation. And then using this command to send the execute operation result.</p> <p><b>OK</b></p> <p><b>+CLMEXECUTE:</b></p> <p><b>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;,&lt;len&gt;,&lt;buffer&gt;</b></p> <p>Parameters</p> <p><b>&lt;lwm2m_id&gt;</b> Integer, LwM2M id, AT+CLMCONF's response.</p> <p><b>&lt;result&gt;</b> Integer, result of write command, error code.</p> <p>0 Success</p> <p>Other value is error code in Spec.</p> <p><b>&lt;object_id&gt;</b> Integer, object id.</p> <p><b>&lt;instance_id&gt;</b> Integer, instance id.</p> <p><b>&lt;resource_id&gt;</b> Integer, resource id.</p> <p>-1 All of resource about the instance.</p> |

|                       |  |
|-----------------------|--|
|                       | <p>&lt;len&gt; Integer, data size.</p> <p>&lt;buffer&gt; Raw data in hex value but char format, execute command.</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

### 9.2.7 AT+CLMNOTIFY Notify Data Change

| AT+CLMNOTIFY Notify Data Change   |  |
|---|--|
| Write Command<br><b>AT+CLMNOTIFY=&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;</b> | <p>Response<br/><b>OK</b></p> <p>Parameters</p> <p>&lt;lwm2m_id&gt; Integer, LwM2M id, AT+CLMCONF's response</p> <p>&lt;object_id&gt; Integer, object id</p> <p>&lt;instance_id&gt; Integer, instance id</p> <p>&lt;resource_id&gt; Integer, resource id</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 9.2.8 AT+CLMDEL Delete LwM2M Instance

| AT+CLMDEL Delete LwM2M Instance                    |  |
|--|--|
| Write Command<br><b>AT+CLMDEL=&lt;lwm2m_id&gt;</b> | <p>Response<br/><b>OK</b></p> <p>Parameters</p> <p>&lt;lwm2m_id&gt; Integer, LwM2M id, AT+CLMCONF's response</p> |
| Parameter Saving Mode                              | NO_SAVE  |
| Max Response Time                                  | -  |
| Reference  | <p>Note</p> <ul style="list-style-type: none"> <li>AT+CLMCONF should be set before this command.</li> </ul>      |

### 9.2.9 +CLMOBSERVE Observed Command

| +CLMOBSERVE Observed Command |          |
|------------------------------|----------|
|                              | Response |

|  |   |
|--|---|
|  | <p>This command used to indicated there is received a observe command.</p> <p><b>+CLMOBSERVE:</b></p> <p><b>&lt;lwm2m_id&gt;,&lt;code&gt;,&lt;object_id&gt;[,&lt;instance_id&gt;],&lt;resource_id&gt;</b></p> <p>Parameters</p> <p><b>&lt;lwm2m_id&gt;</b> Integer, LwM2M id, AT+CLMCONF's response.</p> <p><b>&lt;code&gt;</b> Integer,</p> <p>0 Add observe</p> <p>1 Cancel observe</p> <p><b>&lt;object_id&gt;</b> Integer, object id.</p> <p><b>&lt;instance_id&gt;</b> Integer, instance id.</p> <p>-1 All of instances of the object.</p> <p><b>&lt;resource_id&gt;</b> Integer, resource id.</p> <p>-1 All of resource about the instance.</p> |
|--|---|

### 9.2.10 +CLMPARAMETER Observed Command

| +CLMPARAMETER Observed Command |   |
|--------------------------------|---|
|                                | <p>Response</p> <p>This command used to indicated there is received an observer's parameter command.</p> <p><b>+CLMPARAMETER:</b></p> <p><b>&lt;lwm2m_id&gt;,&lt;object_id&gt;,&lt;instance_id&gt;,&lt;resource_id&gt;,&lt;toSet&gt;,&lt;toClear&gt;,&lt;minPeriod&gt;,&lt;maxPeriod&gt;,&lt;greaterThan&gt;,&lt;lessThan&gt;,&lt;step&gt;</b></p> <p>Parameters</p> <p><b>&lt;lwm2m_id&gt;</b> AT+CLMCONF result</p> <p><b>&lt;object_id&gt;</b> Object id</p> <p><b>&lt;instance_id&gt;</b> Instance id</p> <p>-1 All of instances and resources</p> <p><b>&lt;resource_id&gt;</b> Resource id</p> <p>-1 All of resource about the instance</p> <p><b>&lt;toSet&gt;</b> Integer, toSet value</p> <p><b>&lt;toClear&gt;</b> Integer, toClear value</p> <p><b>&lt;minPeriod&gt;</b> Integer, min Period</p> <p><b>&lt;maxPeriod&gt;</b> Integer, max Period</p> <p><b>&lt;greaterThan&gt;</b> Float,greater than</p> <p><b>&lt;lessThan&gt;</b> Float,less than</p> <p><b>&lt;step&gt;</b> Float,step</p> |

### 9.2.11 +CLMERR Indicated there are Some Errors

| +CLMERR Indicated there are Some Errors |   |
|---|---|
|   | <p>Response</p> <p>This command Indicated there is some error.</p> <p><b>+CLMERR: &lt;lwm2m_id&gt;,&lt;error_code&gt;</b></p> |

|              |   |
|--------------|---|
|              | Parameters                                |
| <lw2m_id>    | Integer, LwM2M id, AT+CLMCONF's response. |
| <error_code> | Integer, error code.                      |
| 1            | Reset by peer point                       |
| 2            | Network disconnect                        |

SIMCOM CONFIDENTIAL FILE

## 10 AT Commands for Network Command – MQTT

### 10.1 Overview of AT Commands for Network Command-MQTT

| Command      | Description                                  |
|--------------|--|
| AT+CMQNEW    | New MQTT                                     |
| AT+CMQCON    | Send MQTT connection packet                  |
| AT+CMQDISCON | Disconnect MQTT                              |
| AT+CMQSUB    | Send MQTT subscribe packet                   |
| AT+CMQUNSUB  | Send MQTT unsubscribe packet                 |
| AT+CMQPUB    | Send MQTT publish packet                     |
| +CMQDISCON   | MQTT disconnect indicator                    |
| AT+CMQALICON | Send MQTT connection packet to Alibaba cloud |
| AT+CMQALICON | Send MQTT connection packet to Alibaba cloud |

### 10.2 Detailed Descriptions of AT Commands for Network Command-MQTT

#### 10.2.1 AT+CMQNEW New MQTT

| AT+CMQNEW   | New MQTT  |
|---|---|
| Test Command<br>AT+CMQNEW=<br>?   | <p>Response</p> <p>+CMQNEW: "server","port", (list of supported &lt;command_timeout_ms&gt;s), (list of supported &lt;bufsize&gt;s)</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p> |
| Read Command<br>AT+CMQNEW?  | <p>Response</p> <p>+CMQNEW: &lt;mqtt_id&gt;,&lt;used_state&gt;,&lt;server&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>AT+CMQNEW=<br><server>,<port>,<br><command_time<br>out_ms>,<bufsiz | <p>Response</p> <p>+CMQNEW: &lt;mqtt_id&gt;</p> <p>OK</p> <p>Parameters</p>   |



|                       |  |
|-----------------------|--|
| e>[,<cid>]            | <p>&lt;mqtt_id&gt; Integer, MQTT id, from 0 to 4</p> <p>&lt;used_state&gt; The used result of mqtt_id</p> <p>0 Not used</p> <p>1 Used</p> <p>&lt;server&gt; String, null or server IP address(or MQTT server name). Max length is 50.</p> <p>&lt;port&gt; String, MQTT server port, can be from 0 to 65535.</p> <p>&lt;command_timeout_ms&gt; Integer, AT command timeout (ms), can be from 0 to 60000.</p> <p>&lt;bufsize&gt; Integer, buffer size, can be from 20 to 1024.</p> <p>&lt;cid&gt; Integer, PDP context ID, AT+CGACT response. [option]</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

## 10.2.2 AT+CMQCON Send MQTT Connection Packet

| AT+CMQCON Send MQTT Connection Packet  |   |
|--|---|
| Test Command<br>AT+CMQCON=?  | <p>Response</p> <p>+CMQCON:</p> <p>&lt;mqtt_id&gt;,&lt;version&gt;,&lt;client_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;,&lt;will_flag&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Read Command<br>AT+CMQCON?   | <p>Response</p> <p>+CMQCON: &lt;mqtt_id&gt;,&lt;connected_state&gt;,&lt;server&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CMQCON=<mqtt_id>,<version>,<client_id>,<keepalive_interval>,<cleansession>,<will_flag>[,<will_options>][,< | <p>Response</p> <p>OK</p> <p>Parameters</p> <p>&lt;mqtt_id&gt; Integer, MQTT id, AT+CMQNEW's response, from 0 to 4</p> <p>&lt;connected_state&gt; The conneted result of mqtt_id,</p> <p>0 Not connected</p> <p>1 Connected</p> <p>&lt;server&gt; String, null(not connect) or MQTT server IP address</p> |

|                       |  |
|-----------------------|--|
| username>,<password>] | <p>&lt;version&gt; Integer , MQTT version, can be 3 or 4</p> <p>&lt;client_id&gt; String, client ID, should be unique.Max length is 32.</p> <p>&lt;keepalive_interval&gt; Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800.</p> <p>&lt;cleansession&gt; Integer , clean session, can be 0 or 1.</p> <p>&lt;will_flag&gt; Integer , will flag, can be 0 or 1.</p> <p>&lt;will_options&gt; String, will options, mandatory if &lt;will_flag&gt; is 1, the format is as follows:<br/>topic=xxx,QoS=xxx,retained=xxx,message_len=xxx,message=xxx</p> <p>&lt;username&gt; String, user name (option). Max length is 32</p> <p>&lt;password&gt; String, password (option). Max length is 50</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>● AT+CMQNEW should be set before this command.</li> <li>● If &lt;will_flag&gt; is 0,then we don't need input &lt;will_options&gt;.</li> </ul>   |

### 10.2.3 AT+CMQDISCON Disconnect MQTT

| AT+CMQDISCON Disconnect MQTT            |   |
|---|---|
| Test Command<br>AT+CMQDISCON=?          | <p>Response</p> <p>+CMQDISCON: &lt;mqtt_id&gt;</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>         |
| Write Command<br>AT+CMQDISCON=<mqtt_id> | <p>Response</p> <p>OK</p> <p>Parameters</p> <p>&lt;mqtt_id&gt; Integer type, MQTT id, AT+CMQNEW's response.</p> |
| Parameter Saving Mode                   | NO_SAVE   |
| Max Response Time                       | -   |
| Reference                               | <p>Note</p> <ul style="list-style-type: none"> <li>● AT+CMQCON should be set before this command.</li> </ul>    |

### 10.2.4 AT+CMQSUB Send MQTT Subscribe Packet

| AT+CMQSUB Send MQTT Subscribe Packet |
|--------------------------------------|
|--------------------------------------|

|   |  |
|---|--|
| Test Command<br><b>AT+CMQSUB=?</b>  | Response<br><b>+CMQSUB: &lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+CMQSUB=&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;mqtt_id&gt;</b> Integer, MQTT id, AT+CMQNEW's response.<br><b>&lt;topic&gt;</b> String, topic of subscribe message. Max length is 128.<br><b>&lt;QoS&gt;</b> Integer, message QoS, can be 0, 1 or 2. |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

#### 10.2.5 AT+CMQUNSUB Send MQTT Unsubscribe Packet

| <b>AT+CMQUNSUB Send MQTT Unsubscribe Packet</b>                   |   |
|---|---|
| Test Command<br><b>AT+CMQUNSUB=?</b>                              | Response<br><b>+CMQUNSUB: &lt;mqtt_id&gt;,&lt;topic&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+CMQUNSUB=&lt;mqtt_id&gt;,&lt;topic&gt;</b> | Response<br><b>OK</b><br><br>Parameters<br><b>&lt;mqtt_id&gt;</b> Integer, MQTT id, AT+CMQNEW's response.<br><b>&lt;topic&gt;</b> String, topic of subscribe message. Max length is 128 |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

## 10.2.6 AT+CMQPUB Send MQTT Publish Packet

| AT+CMQPUB Send MQTT Publish Packet   |  |
|--|--|
| Test Command<br><b>AT+CMQPUB=?</b>   | <p>Response</p> <p><b>+CMQPUB:</b></p> <p><b>&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b></p> <p><b>&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CMQPUB=&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p><b>Unsolicited result code:</b><br/>If the topic has been subscribed, then return:<br/><b>+CMQPUB:</b><br/><b>&lt;mqtt_id&gt;,&lt;topic&gt;,&lt;QoS&gt;,&lt;retained&gt;,&lt;dup&gt;,&lt;message_len&gt;,&lt;message&gt;</b><br/><b>&gt;</b></p> <p>Parameters</p> <p><b>&lt;mqtt_id&gt;</b> Integer, MQTT id, AT+CMQNEW's response.</p> <p><b>&lt;topic&gt;</b> String, topic of publish message. Max length is 128</p> <p><b>&lt;QoS&gt;</b> Integer, message QoS, can be 0, 1 or 2.</p> <p><b>&lt;retained&gt;</b> Integer, retained flag, can be 0 or 1.</p> <p><b>&lt;dup&gt;</b> Integer, duplicate flag, can be 0 or 1.</p> <p><b>&lt;message_len&gt;</b> Integer, length of publish message, can be from 2 to 1000. If message is HEX data streaming, then <b>&lt;message_len&gt;</b> should be odd.</p> <p><b>&lt;message&gt;</b> Default should be a hex data streaming, but if we set AT+CREVHEX=0 then we can send a RAW data message. And if we want to send a HEX data streaming again, we can set AT+CREVHEX=1.</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |
| Reference  | Note   |

## 10.2.7 +CMQDISCON MQTT Disconnect Indication

| +CMQDISCON MQTT Disconnect Indication |          |
|---------------------------------------|----------|
|                                       | Response |

|  |   |
|--|---|
|  | <p>When the URC send, there is some error happen on the mqtt connection. This is probably because the MQTT server has disconnected the device for some reasons.</p> <p><b>+CMQDISCON: &lt;mqtt_id&gt;</b></p> |
|  | <p>Parameters</p> <p><b>&lt;mqtt_id&gt;</b> Integer, MQTT id, AT+CMQNEW's response.</p>   |

### 10.2.8 AT+CMQALICFG Configure Alibaba Cloud Parameters

| AT+CMQALICFG Configure Alibaba Cloud Parameters   |   |
|---|---|
| Test Command<br><b>AT+CMQALICFG=?</b>   | <p>Response</p> <p><b>+CMQALICFG:</b><br/><b>&lt;mqtt_id&gt;,&lt;productKey&gt;,&lt;deviceName&gt;,&lt;deviceSecret&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+CMQALICFG=&lt;mqtt_id&gt;,&lt;productKey&gt;,&lt;deviceName&gt;,&lt;deviceSecret&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;mqtt_id&gt;</b> Integer, MQTT id, AT+CMQNEW's response, from 0 to 4</p> <p><b>&lt;productKey&gt;</b> Product Key, get it from Alibaba Cloud.</p> <p><b>&lt;deviceName&gt;</b> Device Name, get it from Alibaba Cloud.</p> <p><b>&lt;deviceSecret&gt;</b> Device Secret, get it from Alibaba Cloud.</p> |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | <p>Note</p> <ul style="list-style-type: none"> <li>● AT+CMQNEW should be set before this command.</li> <li>● This command is a special command to connect to Alibaba Cloud</li> </ul>   |

### 10.2.9 AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud

| AT+CMQALICON Send MQTT Connection Packet to Alibaba Cloud |  |
|---|--|
| Test Command<br><b>AT+CMQALICON=?</b>                     | <p>Response</p> <p><b>+CMQALICON: &lt;mqtt_id&gt;,&lt;keepalive_interval&gt;,&lt;cleansession&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p> |
| Write Command<br><b>AT+CMQALICON</b>                      | <p>Response</p> <p><b>OK</b></p>   |

|  |   |
|--|---|
| ON=<mqtt_id>,<keepalive_interval>,<cleansession> | <p>Parameters</p> <p>&lt;mqtt_id&gt; Integer, MQTT id, AT+CMQNEW's response, from 0 to 4</p> <p>&lt;keepalive_interval&gt; Integer, keep alive interval, don't suggest to set it to a small value because server may disconnect the device for some reason, can be from 0 to 64800.</p> <p>&lt;cleansession&gt; Integer, clean session, can be 0 or 1</p> |
| Parameter Saving Mode                            | NO_SAVE   |
| Max Response Time                                | -   |
| Reference  | <p>Note</p> <ul style="list-style-type: none"> <li>● AT+CMQNEW and AT+CMQALICON should be set before this command.</li> <li>● This command is a special command to connect to Alibaba Cloud.</li> </ul>   |

## 11 AT Commands for Network Command – CoAP

### 11.1 Overview of AT Commands for Network Command-CoAP

| Command       | Description   |
|---------------|---|
| AT+CCOAPNEW   | Create a CoAP client instance                                   |
| AT+CCOAPSEND  | Send data to CoAP server with the created CoAP client instance. |
| AT+CCOAPCSEND | Send CoAP Data  |
| AT+CCOAPDEL   | Destory the CoAP client instance                                |
| +CCOAPNMI     | Content from CoAP server  |

### 11.2 Detailed Descriptions of AT Commands for Network Command-CoAP

#### 11.2.1 AT+CCOAPNEW Create a CoAP Client Instance

| AT+CCOAPNEW Create a CoAP Client Instance           |   |
|---|---|
| Test Command<br>AT+CCOAPNEW=?                       | <p>Response</p> <p><b>+CCOAPNEW: (0-255).(0-255).(0-255).(0-255),(0-65535),(0-10)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT+CCOAPNEW=<ip_addr>,<port>,<cid> | <p>Response</p> <p><b>+CCOAPNEW: &lt;coap_id&gt;</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>&lt;ip_addr&gt; String, CoAP server IP address.</p> <p>&lt;port&gt; Integer, CoAP server port(spec default 5683).</p> <p>&lt;cid&gt; Integer, PDP context ID, AT+CGACT response.</p> <p>&lt;coap_id&gt; Integer, CoAP client instance id created by the command.</p> |
| Parameter Saving Mode                               | NO_SAVE   |
| Max Response Time                                   | -   |
| Reference   | Note  |

### 11.2.2 AT+CCOAPSEND Send CoAP Data

| AT+CCOAPSEND Send CoAP Data  |  |
|--|--|
| Test Command<br><b>AT+CCOAPSEND=?</b>  | <p>Response</p> <p><b>+CCOAPSEND: (1-2),(4-512),"data"</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br><b>AT+CCOAPSEND=&lt;coap_id&gt;,&lt;data_len&gt;,&lt;data&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;coap_id&gt;</b> Integer, CoAP client instance id created by the AT+CCOAPNEW command.</p> <p><b>&lt;data_len&gt;</b> Integer, Send data length (by byte).</p> <p><b>&lt;data&gt;</b> String, the hex data streaming.</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | <p>Note</p> <p>AT+CCOAPNEW should be set before this command.</p>  |

### 11.2.3 AT+CCOAPCSEND Send CoAP Data

| AT+CCOAPCSEND Send CoAP Data  |  |
|---|--|
| Test Command<br><b>AT+CCOAPCSEND=?</b>  | <p>Response</p> <p><b>+CCOAPCSEND: (1-2),(1),(0-3),(0-7),(0-31),"token","option",(0-512),"data"</b></p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br><b>AT+CCOAPCSEND=&lt;coap_id&gt;,&lt;version&gt;,&lt;type&gt;,&lt;h_code&gt;,&lt;l_code&gt;,&lt;token&gt;,&lt;option&gt;,&lt;data_len&gt;,&lt;data&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>Parameters</p> <p><b>&lt;coap_id&gt;</b> Integer, CoAP client instance id created by the AT+CCOAPNEW command.</p> <p><b>&lt;version&gt;</b> Integer, version information , the current value is 1.</p> <p><b>&lt;type&gt;</b> Integer, the message type.</p> <p>0 CON, confirmable message (requires ACK/RST).</p> <p>1 NON, non-confirmable message (one-shot message).</p> <p>2 ACK, used to acknowledge confirmable messages.</p> |



3 RST, indicates error in received messages.

**<code>** Function code or response code. Code takes different forms in CoAP request message and response message. Code takes one byte and is divided into two parts, the first three bits **<h\_code>** and the last five bits **<l\_code>**. In order to describe it conveniently, it is written into c.dd structure (such as 0.01, 2.01, 4.02 and so on). For example, if **<h\_code>** is 4 and **<l\_code>** is 12, so **<code>** is 4.12.

**<h\_code>** Integer, the first three bits of the **<code>** value.

- 0 Empty message or request
- 1 Reserved
- 2-5 Response
- 6-7 Reserved.

**<l\_code>** Integer, the last five bits of the **<code>** value (0-31).

**Request:**

- [0.01] GET method, get resource
- [0.02] POST method, creat resource
- [0.03] PUT method, update resource
- [0.04] DELETE method, delete resource

**Response:**

- [2.01] Created
- [2.02] Deleted
- [2.03] Valid
- [2.04] Changed
- [2.05] Content.
- [4.00] Bad Request.
- [4.01] Unauthorized.
- [4.02] Bad Option.
- [4.03] Forbidden.
- [4.04] Not Found.
- [4.05] Method Not Allowed.
- [4.06] Not Acceptable.
- [4.12] Precondition Failed.
- [4.15] Unsuppor Conten-Type.
- [5.00] Internal Server Error.
- [5.01] Not Implemented.
- [5.02] Bad Gateway.
- [5.03] Service Unavailable.
- [5.04] Gateway Timeout.
- [5.05] Proxying Not Supported.

**<token>** String, the hex data streaming ,request id, relate the response to the request(option).

|                       |   |
|-----------------------|---|
|                       | <p><b>&lt;option&gt;</b> String, the hex data streaming ,zero or more options(option).</p> <p><b>&lt;data_len&gt;</b> Integer, Send data length(by byte).</p> <p><b>&lt;data&gt;</b> String, the hex data streaming(payload).</p> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | <p>Note</p> <p>AT+CCOAPNEW should be set before this command.</p>   |

#### 11.2.4 AT+CCOAPDEL Destory the CoAP Client Instance

| AT+CCOAPDEL Destory the CoAP Client Instance |  |
|--|--|
| Test Command<br>AT+CCOAPDEL=?                | <p>Response</p> <p>+CCOAPDEL: (1-2)</p> <p>OK</p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CCOAPDEL=<coap_id>       | <p>Response</p> <p>OK</p> <p>Parameters</p> <p><b>&lt;coap_id&gt;</b> Integer, CoAP client instance id created by the AT+CCOAPNEW command.</p> |
| Parameter Saving Mode                        | NO_SAVE  |
| Max Response Time                            | -  |
| Reference                                    | <p>Note</p> <p>AT+CCOAPNEW should be set before this command.</p>  |

#### 11.2.5 +CCOAPNMI Content from CoAP server

| +CCOAPNMI Content from CoAP server |  |
|------------------------------------|--|
|                                    | <p>Response</p> <p>+CCOAPNMI: &lt;coap_id&gt;,&lt;data_len&gt;,&lt;data&gt;</p> <p>Parameters</p> <p><b>&lt;coap_id&gt;</b> Integer, CoAP client instance id created by the AT+CCOAPNEW command.</p> <p><b>&lt;data_len&gt;</b> Integer, data length (by byte).</p> <p><b>&lt;data&gt;</b> String, the hex data streaming.</p> |

## 12 AT Commands for Network Command – SNTP

### 12.1 Overview of AT Commands for Network Command-SNTP

| Command       | Description                 |
|---------------|-----------------------------|
| AT+CSNTPSTART | Start to query network time |
| AT+CSNTPSTOP  | Stop to query network time  |
| +CSNTP        | Received network time       |

### 12.2 Detailed Descriptions of AT Commands for Network Command-SNTP

#### 12.2.1 AT+CSNTPSTART Start to Query Network Time

| AT+CSNTPSTART Start to Query Network Time         |  |
|---|--|
| Write Command<br>AT+CSNTPSTART<br>RT=<url>[,zone] | Response<br><b>OK</b><br><br>Parameters<br><url> A string of SNTP server name or IP address.<br><zone> String type value; On behalf of the time zone, range -47...+48. The eastern region is denoted as "+32". |
| Parameter Saving Mode                             | NO_SAVE  |
| Max Response Time                                 | -  |
| Reference   | Note   |

#### 12.2.2 AT+CSNTPSTOP Stop to Query Network Time

| AT+CSNTPSTOP Stop to Query Network Time |                       |
|---|-----------------------|
| Execution Command<br>AT+CSNTPSTOP       | Response<br><b>OK</b> |
| Parameter Saving Mode                   | NO_SAVE               |
| Max Response Time                       | -                     |
| Reference                               | Note                  |

### 12.2.3 +CSNTP Received Network Time

| +CSNTP Received Network Time |  |
|------------------------------|--|
|                              | <p>Response</p> <p>Indicated there is received some data from network.</p> <p><b>+CSNTP: &lt;time&gt;[,zone]</b></p>   |
|                              | <p>Parameters</p> <p><b>&lt;time&gt;</b> String type value; format is yy/MM/dd,hh:mm:ss:ms, where characters indicate year (two last digits),month, day, hour, minutes, seconds and millisecond . E.g 10/05/06,00:01:52:62</p> <p><b>&lt;zone&gt;</b> String type value; On behalf of the time zone, range -47...+48.The eastern region is denoted as “+32”.</p> |

## 13 AT Commands for Network Command – TLS

### 13.1 Overview of AT Commands for Network Command- TLS

| Command      | Description              |
|--------------|--------------------------|
| AT+CTLSCFG   | Configure TLS parameters |
| AT+CTLSCONN  | Create a TLS connection  |
| AT+CTLSCLOSE | Close a TLS connection   |
| AT+CTLSEND   | Send data                |
| AT+CTLSCRECV | Receive data             |

### 13.2 Detailed Descriptions of AT Commands for Network Command-TLS

#### 13.2.1 AT+CTLSCFG Configure TLS Parameters

| AT+CTLSCFG Configure TLS Parameters   |  |
|---|--|
| Write Command<br>AT+CTLSCFG=<br><tid>,<type>,<value>[,<type>,<value>[,<type>,<value>[...]]] | Response<br><b>OK</b><br><br>Parameters<br><tid> Integer type.It is the identifier of the TLS connection to be created.<br><type> Integer type.It is the type of the parameter to be configured.<br>1 Server name (string)<br>2 Port (int, default value is 443)<br>3 Socket type (0-tcp, tcp supported only, default value is 0)<br>4 Auth_mode (int, 0-none, 1-optional, 2-required, default value is 2)<br>5 Debug level (int, 0~4, 0-no log, 4-all log enabled, default value is 0)<br>6 Server CA (<size><more><certificate>, size (int)-total size of the certificate without the terminate null; more(int)-is there more certificate content needed to be sent, 1-yes, 0-no; certificate (string)-the total or partial of the certificate content. default value for type 6 is null)<br>7 Client certificate (same as 6-server CA, default value for type 7 is null)<br>8 Client private key (<size><more><private-key>, size and more is the same as 6-server CA, private-key (string)-the total or partial of the private-key, default value for type 8 is null)<br><value> Integer type.It is the value of the parameter to be configured. |
| Parameter Saving Mode   | NO_SAVE  |

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

### 13.2.2 AT+CTLSCONN Create a TLS Connection

| AT+CTLSCONN Create a TLS Connection                                     |  |
|---|--|
| Write Command<br><b>AT+CTLSCONN</b><br><b>N=&lt;tid&gt;,&lt;cid&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p><b>+CTLSCONN: &lt;tid&gt;,&lt;ret&gt;</b></p> <p>Parameters</p> <p><b>&lt;tid&gt;</b> Integer type. It is the identifier of the TLS connection to be created.It should be the same as the one in CTLSCFG.</p> <p><b>&lt;ret&gt;</b> Integer type.It tells the result of the TLS connection.If the connection succeeds, it is 1.Otherwise,it is the error code.</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 13.2.3 AT+CTLSCLOSE Close a TLS Connection

| AT+CTLSCLOSE Close a TLS Connection                          |  |
|--|--|
| Write Command<br><b>AT+CTLSCLOSE</b><br><b>E=&lt;tid&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p><b>+CTLSCLOSE: &lt;tid&gt;,&lt;ret&gt;</b></p> <p>Parameters</p> <p><b>&lt;tid&gt;</b> Integer type.It is the identifier of the TLS connection to be created.It should be the same as the one in CTLSCFG.</p> <p><b>&lt;cid&gt;</b> Integer type.It is a numeric parameter specifying a particular PDP context returned by CGACT.</p> <p><b>&lt;ret&gt;</b> Integer type.It tells the result of the TLS connection closure.If the closure succeeds, it is 1.Otherwise, it is the error code.</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

### 13.2.4 AT+CTLSEND Send Data

| AT+CTLSEND Send Data  |  |
|---|--|
| Write Command<br><b>AT+CTLSEND</b><br><b>=&lt;tid&gt;,&lt;data_len&gt;,&lt;data&gt;[,&lt;encode_method&gt;]</b> | Response<br><b>OK</b><br><br><b>+CTLSEND: &lt;tid&gt;,&lt;ret&gt;</b><br><br>Parameters<br><b>&lt;tid&gt;</b> Integer type.It is the identifier of the TLS connection to be created.It should be the same as the one in CTLSCFG.<br><b>&lt;data_len&gt;</b> Integer type.It is the length of the <data>.<br><b>&lt;data&gt;</b> It is the data sent.<br><b>&lt;encode_method&gt;</b> Integer type.It is the encode method used for <data>.<br>801 String encoding and it is the default value which can be omitted.<br>802 Hex encoding<br>803 Base64 encoding<br><b>&lt;ret&gt;</b> Integer type.It tells the result of the data sending.If it is greater than 0, it is the actual number of data send.Otherwise, it is the error code. |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   | Note   |

### 13.2.5 AT+CTLSRECV Receive Data

| AT+CTLSRECV Receive Data   |   |
|--|---|
| Write Command<br><b>AT+CTLSRECV</b><br><b>=&lt;tid&gt;,&lt;max_num&gt;[,&lt;encode_method&gt;]</b> | Response<br><b>OK</b><br><br><b>+CTLSRECV: &lt;tid&gt;,&lt;ret&gt;[,&lt;data&gt;[,&lt;encode_method&gt;]]</b><br><br>Parameters<br><b>&lt;tid&gt;</b> Integer type. It is the identifier of the TLS connection to be created.It should be the same as the one in CTLSCFG.<br><b>&lt;max_num&gt;</b> Integer type. It is the maximum number of plain data without encoding that could be received.<br><b>&lt;encode_method&gt;</b> Integer type. It is the encode method used for <data>.801 is for string encoding and it is the default value which can be omitted. 802 is for hex encoding. And 803 is for base64 encoding.<br><b>&lt;ret&gt;</b> Integer type.If it is greater than 0, it is the length of data received |

|                       |   |
|-----------------------|---|
|                       | after encoding .Otherwise, it is the error code.<br><data> It is the data received with encoding. |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             | Note  |



## 14 AT Commands for Network Command –OneNET

### 14.1 Overview of AT Commands for Network Command- OneNet

| Command                  | Description                                |
|--------------------------|--|
| AT+MIPLCREATE            | Create a OneNET instance                   |
| AT+MIPLCREATEE<br>XT     | Another method to Create a OneNET instance |
| AT+MIPLDELETE            | Delete a OneNET instance                   |
| AT+MIPLOPEN              | Register to OneNET.                        |
| AT+MIPLCLOSE             | Deregister to OneNET                       |
| AT+MIPLADDOBJ            | Add an object                              |
| AT+MIPLDELOBJ            | Delete an object                           |
| AT+MIPLUPDATE            | Update registration                        |
| AT+MIPLREADRSP           | Read response from user                    |
| AT+MIPLWRITERSP          | Write response from user                   |
| AT+MIPLEXECUTE<br>RSP    | Execute response from user                 |
| AT+MIPLOBSERVE<br>RSP    | Observe response from user                 |
| AT+MIPLDISCOVE<br>RRSP   | Discover response from user                |
| AT+MIPLPARAMET<br>ERRSP  | Set parameter from to user                 |
| AT+MIPLNOTIFY            | Notify data value change from user         |
| AT+MIPLVER               | Read version                               |
| AT+MIPLBOOTSTR<br>APPARA | Set parameter for connect bootstrap or not |
| +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              |
| +MIPEVENT                | Event indication to user                   |

## 14.2 Detailed Descriptions of AT Commands for Network Command-OneNet

### 14.2.1 AT+MIPLCREATE Create a OneNET Instance

| AT+MIPLCREATE Create a OneNET Instance  |  |
|---|--|
| Test Command<br><b>AT+MIPLCREATE=?</b>  | <p>Response</p> <p><b>+MIPLCREATE:</b> (list of supported <b>&lt;totalsize&gt;</b>),(list of supported <b>&lt;config&gt;</b>),(list of supported <b>&lt;index&gt;</b>),(list of supported <b>&lt;currentsize&gt;</b>),(list of supported <b>&lt;flag&gt;</b>)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br><b>AT+MIPLCREATE?</b>   | <p>Response</p> <p><b>+MIPLCREATE:</b> <b>&lt;id&gt;</b>,<b>&lt;used_state&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+MIPLCREATE=&lt;totalsize&gt;,&lt;config&gt;,&lt;index&gt;,&lt;currentsize&gt;,&lt;flag&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p>--message received correctly if index not equals to 0</p> <p><b>+MIPLCREATE:</b> <b>&lt;id&gt;</b></p> <p><b>OK</b></p> <p>--message received correctly and return OneNET instance</p> <p>or</p> <p><b>+CIS ERROR:</b> <b>&lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;totalsize&gt;</b> Integer, configuration file total size(it is byte size)</p> <p><b>&lt;config&gt;</b> Hex string, configuration file, ex: 130033f1.....</p> <p><b>&lt;index&gt;</b> Integer, configuration file index, from 0 to 1024</p> <p><b>&lt;currentsize&gt;</b> Integer, configuration file size in current AT command(it is byte size)</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;id&gt;</b> Integer, create onenet id</p> <p><b>&lt;used_state&gt;</b> Integer, the used result of AT+MIPLCREATE</p> <p>0 Not used</p> |

|                       |         |
|-----------------------|---------|
|                       | 1 Used  |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time     | -       |
| Reference             |         |

#### 14.2.2 AT+MIPLCREATEEXT Another Method to Create a OneNET Instance

| AT+MIPLCREATEEXT Another Method to Create a OneNET Instance      |   |
|--|---|
| Test Command<br><b>AT+MIPLCREATEEXT=?</b>                        | <p>Response</p> <p><b>+MIPLCREATEEXT: (0-255).(0-255).(0-255).(0-255) ,(0,1)</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>   |
| Read Command<br><b>AT+MIPLCREATEEXT?</b>                         | <p>Response</p> <p><b>+MIPLCREATEEXT: &lt;id&gt;,&lt;used_state&gt;</b></p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+MIPLCREATEEXT=&lt;addr&gt;,&lt;bs&gt;</b> | <p>Response</p> <p><b>+MIPLCREATEEXT: &lt;id&gt;</b></p> <p><b>OK</b></p> <p>--message received correctly and return OneNET instance</p> <p>or</p> <p><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;addr&gt;</b> String. OneNet host IP address</p> <p><b>&lt;bs&gt;</b> Integer. OneNet host bootstrap value</p> <p>0 Bootstrap disabled</p> <p>1 Bootstrap enabled</p> <p>Such as: 183.230.40.39, bs value is set to 1</p> <p>183.230.40.40, bs value is set to 0</p> <p><b>&lt;id&gt;</b> Integer, Create onenet id</p> <p><b>&lt;used_state&gt;</b> Integer.The used result of AT+MIPLCREATE</p> <p>0 Not used</p> <p>1 Used</p> |
| Parameter Saving Mode  | NO_SAVE   |

|                   |  |
|-------------------|--|
| Max Response Time | -  |
| Reference         | Note<br>The parameter of "BS" is necessary from OneNET Ver 2.2.0, but it is needless before OneNET Ver2.2.0. |

#### 14.2.3 AT+MIPLDELETE Delete a OneNET Instance

| AT+MIPLDELETE Delete a OneNET Instance           |   |
|--|---|
| Test Command<br><b>AT+MIPLDELETE=?</b>           | Response<br><b>+MIPLDELETE:</b> (list of supported <id>)<br><br><b>OK</b> |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLDELETE=&lt;id&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>             |
|  | Parameters<br><id> Integer, OneNET instance returned by AT+MIPLCREATE     |
| Parameter Saving Mode                            | NO_SAVE   |
| Max Response Time                                | -   |
| Reference  |   |

#### 14.2.4 AT+MIPLOPEN Register to OneNET

| AT+MIPLOPEN Register to OneNET       |  |
|--------------------------------------|--|
| Test Command<br><b>AT+MIPLOPEN=?</b> | Response<br><b>+MIPLOPEN:</b> (list of supported <id>),( list of supported <lifetime>),( list of supported <param>)<br><br><b>OK</b> |
|                                      | Parameters<br>See Write Command  |
| Read Command<br><b>AT+MIPLOPEN?</b>  | Response<br><b>+MIPLOPEN: &lt;id&gt;,&lt;connected_state&gt;</b><br><br><b>OK</b>  |
|                                      | Parameters<br>See Write Command  |

|  |   |
|--|---|
| Write Command<br><b>AT+MIPOPEN</b><br><b>=&lt;id&gt;,&lt;lifetime&gt;</b><br><b>[,&lt;param&gt;]</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><b>&lt;id&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE<br><b>&lt;lifetime&gt;</b> Integer, lifetime to register ONENET server.The unit is second.<br><b>&lt;param&gt;</b> Reserved<br><b>&lt;connected_state&gt;</b> The connected result of AT+MIPOPEN<br>0 Not connected<br>1 Connected |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  |   |

#### 14.2.5 AT+MIPLCLOSE Deregister to OneNET

| <b>AT+MIPLCLOSE Deregister to OneNET</b>        |  |
|---|--|
| Test Command<br><b>AT+MIPLCLOSE=?</b>           | Response<br><b>+MIPLCLOSE: (list of supported &lt;id&gt;)</b><br><br><b>OK</b>     |
|   | Parameters<br>See Write Command  |
| Write Command<br><b>AT+MIPLCLOSE=&lt;id&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>                      |
|   | Parameters<br><b>&lt;id&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE |
| Parameter Saving Mode                           | NO_SAVE  |
| Max Response Time                               | -  |
| Reference                                       |  |

#### 14.2.6 AT+MIPLADDOBJ Add an Object

| <b>AT+MIPLADDOBJ Add an Object</b> |          |
|------------------------------------|----------|
| Test Command                       | Response |

|  |   |
|--|---|
| <b>AT+MIPLADD<br/>OBJ=?</b>  | <b>+MIPLADDOBJ:</b> (list of supported <id>),(list of supported <objectid>),(list of supported <instancecount>),(list of supported <instancebitmap>),(list of supported <attributecount>),(list of supported <actioncount>)<br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Read Command<br><b>AT+MIPLADD<br/>OBJ?</b>   | Response<br><b>+MIPLADDOBJ: &lt;object_num&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command  |
| Write Command<br><b>AT+MIPLADD<br/>OBJ=&lt;id&gt;,&lt;objectid&gt;,&lt;instancecount&gt;,&lt;instancebitmap&gt;,&lt;attributecount&gt;,&lt;actioncount&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b><br><br>Parameters<br><id> Integer, OneNET instance returned by AT+MIPLCREATE<br><objectid> Integer, object id<br><instancecount> Integer, instance count<br><instancebitmap> Binary string, instance bitmap, ex: "00101" (5 instances, only instance 1 & 3 are available)<br><attributecount> Integer, attribute count(The Object that has read or write operation, has the attribute)<br><actioncount> Integer, action count(The Object that has execute operation, has the action)<br><object_num> Current OneNET object number |
| Parameter Saving Mode  | NO_SAVE   |
| Max Response Time  | -   |
| Reference  |   |

#### 14.2.7 AT+MIPLDELOBJ Delete an Object

| <b>AT+MIPLDELOBJ Delete an Object</b>  |  |
|--|--|
| Test Command<br><b>AT+MIPLDELOBJ=?</b> | Response<br><b>+MIPLDELOBJ:</b> (list of supported <id>),(list of supported <objectid>)<br><br><b>OK</b><br><br>Parameters |

|   |  |
|---|--|
|   | See Write Command  |
| Write Command<br><b>AT+MIPLDELOBJ=&lt;id&gt;,&lt;objectid&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>  |
|   | Parameters<br><b>&lt;id&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE<br><b>&lt;objectid&gt;</b> Integer, object id |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   |  |

#### 14.2.8 AT+MIPLUPDATE Update Registration

| AT+MIPLUPDATE Update Registration  |  |
|--|--|
| Test Command<br><b>AT+MIPLUPDATE=?</b>   | Response<br><b>+MIPLUPDATE:</b> (list of supported <b>&lt;id&gt;</b> ),(list of supported <b>&lt;lifetime&gt;</b> ),(list of supported <b>&lt;withObjectFlag&gt;</b> )<br><br><b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+MIPLUPDATE=&lt;id&gt;,&lt;lifetime&gt;,&lt;withObjectFlag&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>  |
|  | Parameters<br><b>&lt;id&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE<br><b>&lt;lifetime&gt;</b> Integer, lifetime to update registration. The unit is second.<br><b>&lt;withObjectFlag&gt;</b> Integer, whether to update objects<br>0 Not upate objects<br>1 Update objects |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  |  |

#### 14.2.9 AT+MIPLREADRSP Read Response from User

##### AT+MIPLREADRSP Read Response from User

|  |   |
|--|---|
| <p>Test Command</p> <p><b>AT+MIPLREAD</b></p> <p><b>RSP=?</b></p>  | <p>Response</p> <p><b>+MIPLREADRSP:</b> (list of supported <b>&lt;id&gt;</b>),(list of supported <b>&lt;msgid&gt;</b>),(list of supported <b>&lt;result&gt;</b>),(list of supported <b>&lt;objectid&gt;</b>),(list of supported <b>&lt;instanceid&gt;</b>),(list of supported <b>&lt;resourceid&gt;</b>),(list of supported <b>&lt;valuetype&gt;</b>),(list of supported <b>&lt;len&gt;</b>),(list of supported <b>&lt;value&gt;</b>),(list of supported <b>&lt;index&gt;</b>),( list of supported <b>&lt;flag&gt;</b>)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| <p>Write Command</p> <p><b>AT+MIPLREAD</b></p> <p><b>RSP=&lt;id&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></p> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p><b>&lt;id&gt;</b> Integer, OneNET instance returned by AT+MIPLCREATE</p> <p><b>&lt;msgid&gt;</b> Integer, message id,the same to +MIPLREAD</p> <p><b>&lt;result&gt;</b> Integer, read result, 1 indicates read success, should provide read content in the same time</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul> <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, read data value type</p> <ul style="list-style-type: none"> <li>1 String</li> <li>2 Opaque</li> <li>3 Integer</li> <li>4 Float</li> <li>5 Bool</li> </ul> <p><b>&lt;len&gt;</b> Integer, read data length. It can be ommited, if valuetype is Integer or Float, or Bool</p> <p><b>&lt;value&gt;</b> Integer, read data value</p> <p><b>&lt;index&gt;</b> Integer, message index, from 0 to 1024</p> <p><b>&lt;flag&gt;</b> Integer, message flag</p> <ul style="list-style-type: none"> <li>1 First message</li> <li>2 Middle message</li> <li>0 Last message</li> </ul> |



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

#### 14.2.10 AT+MIPLWRITERSP Write Response from User

| AT+MIPLWRITERSP Write Response from User  |  |
|---|--|
| Test Command<br><b>AT+MIPLWRITERSP=?</b>  | <p>Response</p> <p><b>+MIPLWRITERSP:</b> (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+MIPLWRITERSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | <p>Response</p> <p><b>OK</b><br/>or<br/><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;id&gt; Integer, OneNET instance returned by AT+MIPLCREATE<br/>           &lt;msgid&gt; Integer, message id, the same to +MIPLWRITE<br/>           &lt;result&gt; Integer, write result, 2 indicates write success</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   |  |

#### 14.2.11 AT+MIPLEXECUTERSP Execute Response from User

| AT+MIPLEXECUTERSP Execute Response from User |  |
|--|--|
| Test Command<br><b>AT+MIPLEXECUTERSP=?</b>   | <p>Response</p> <p><b>+MIPLEXECUTERSP:</b> (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</p> |

|  |   |
|--|---|
|  | <b>OK</b>   |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLEXEC<br/>UTERSP=&lt;id&gt;&lt;<br/>msgid&gt;,&lt;result&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><id> Integer, OneNET instance returned by AT+MIPLCREATE<br><msgid> Integer, message id, the same to +MIPLEXECUTE<br><result> Integer, execute result, 2 indicates execute success<br>1 Read/Observe/Discover OK<br>2 Write/Execute/ Set parameter OK<br>11 400 Bad request<br>12 401 Unauthorized<br>13 404 Not Found<br>14 405 Method Not Allowed<br>15 406 Not Acceptable |
| Parameter Saving<br>Mode   | NO_SAVE   |
| Max Response<br>Time   | -   |
| Reference  |   |

#### 14.2.12 AT+MIPLOBSERVERSP Observe Response from User

| AT+MIPLOBSERVERSP Observe Response from User   |   |
|--|---|
| Test Command<br><b>AT+MIPLOBSE<br/>RVERSP=?</b>  | Response<br><b>+MIPLOBSERVERSP: (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</b><br><br><b>OK</b>  |
|  | Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLOBSE<br/>RVERSP=&lt;id&gt;&lt;<br/>msgid&gt;,&lt;result&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b>   |
|  | Parameters<br><id> Integer, OneNET instance returned by AT+MIPLCREATE<br><msgid> Integer, message id, the same to +MIPLOBSERVE<br><result> Integer, (cancel) observe result, 1 indicates (cancel) observe |

|                       |   |
|-----------------------|---|
|                       | <p>success</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul> |
| Parameter Saving Mode | NO_SAVE   |
| Max Response Time     | -   |
| Reference             |   |

#### 14.2.13 AT+MIPLDISCOVERRSP Discover Response from User

| AT+MIPLDISCOVERRSP Discover Response from User   |  |
|--|--|
| <p>Test Command</p> <p><b>AT+MIPLDISCOVERRSP=?</b></p>   | <p>Response</p> <p><b>+MIPLDISCOVERRSP:</b> (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;), (list of supported &lt;length&gt;),(list of supported &lt;valuestring&gt;)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| <p>Write Command</p> <p><b>AT+MIPLDISCOVERRSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;,&lt;length&gt;,&lt;valuestring&gt;</b></p> | <p>Response</p> <p><b>OK</b></p> <p>or</p> <p><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;id&gt; Integer, OneNET instance returned by AT+MIPLCREATE</p> <p>&lt;msgid&gt; Integer, message id, the same to +MIPLDISCOVER</p> <p>&lt;result&gt; Integer, discover result, 1 indicates discover success</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul> <p>&lt;length&gt; Integer, length of valuestring</p> <p>&lt;valuestring&gt; String, value string (resourceId; resourceId; ...; resourceId), must start with "" and end with ""</p> |

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

#### 14.2.14 AT+MIPLPARAMETERRSP Set Parameter from User

| AT+MIPLPARAMETERRSP Set Parameter from User   |  |
|---|--|
| Test Command<br><b>AT+MIPLPARAMETERRSP=?</b>  | <p>Response</p> <p><b>+MIPLPARAMETERRSP:</b> (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;result&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br><b>AT+MIPLPARAMETERRSP=&lt;id&gt;,&lt;msgid&gt;,&lt;result&gt;</b> | <p>Response</p> <p><b>OK</b><br/>or<br/><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters</p> <p>&lt;id&gt; Integer, OneNET instance returned by AT+MIPLCREATE<br/>           &lt;msgid&gt; Integer, message id, the same to +MIPLPARAMETER<br/>           &lt;result&gt; Integer, set parameter result, 2 indicates set parameter success</p> <ul style="list-style-type: none"> <li>1 Read/Observe/Discover OK</li> <li>2 Write/Execute/ Set parameter OK</li> <li>11 400 Bad request</li> <li>12 401 Unauthorized</li> <li>13 404 Not Found</li> <li>14 405 Method Not Allowed</li> <li>15 406 Not Acceptable</li> </ul> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |
| Reference   |  |

#### 14.2.15 AT+MIPLNOTIFY Notify Data Value Change from User

| AT+MIPLNOTIFY Notify Data Value Change from User |  |
|--|--|
| Test Command<br><b>AT+MIPLNOTIFY=?</b>           | <p>Response</p> <p><b>+MIPLNOTIFY:</b> (list of supported &lt;id&gt;),(list of supported &lt;msgid&gt;),(list of supported &lt;objectid&gt;),(list of supported &lt;instanceid&gt;),(list of supported</p> |

|  |  |
|--|--|
|  | <p>&lt;resourceid&gt;),(list of supported &lt;valuetype&gt;), (list of supported &lt;len&gt;),(list of supported &lt;value&gt;),(list of supported &lt;index&gt;),(list of supported &lt;flag&gt;),(list of supported &lt;ack&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| <p>Write Command<br/><b>AT+MIPLNOTIFY=&lt;id&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;ack&gt;]</b></p> | <p>Response<br/><b>OK</b><br/>or<br/><b>+CIS ERROR: &lt;err&gt;</b></p> <p>Parameters<br/>           &lt;id&gt; Integer, OneNET instance returned by AT+MIPLCREATE<br/>           &lt;msgid&gt; Integer, message id<br/>           &lt;objectid&gt; Integer, object id<br/>           &lt;instanceid&gt; Integer, instance id<br/>           &lt;resourceid&gt; Integer, resource id<br/>           &lt;valuetype&gt; Integer, read data value type<br/>               1 String<br/>               2 Opaque<br/>               3 Integer<br/>               4 Float<br/>               5 Bool<br/>           &lt;len&gt; Integer, write data length. It can be omitted, if valuetype is Integer or Float, or Bool<br/>           &lt;value&gt; Integer, write data value<br/>           &lt;index&gt; Integer, message index, from 0 to 1024<br/>           &lt;flag&gt; Integer, message flag<br/>               1 First message<br/>               2 Middle message<br/>               0 Last message<br/>           &lt;ack&gt; Integer, ack id [option]<br/>           If omit it, there is no result URC after this command</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  |  |

#### 14.2.16 AT+MIPLVER Read Version

##### AT+MIPLVER Read Version

|                                    |   |
|------------------------------------|---|
| Read Command<br><b>AT+MIPLVER?</b> | Response<br><b>+MIPLVER: &lt;version&gt;</b><br><br><b>OK</b><br><br>Parameters<br><b>&lt;version&gt;</b> Onenet version, such as 2.2.0 |
| Parameter Saving Mode              | NO_SAVE   |
| Max Response Time                  | -   |
| Reference                          |   |

#### 14.2.17 AT+MIPLBOOTSTRAPPARA Set Parameter for Connect Bootstrap

| <b>AT+MIPLBOOTSTRAPPARA Set Parameter for Connect Bootstrap</b>               |  |
|---|--|
| Test Command<br><b>AT+MIPLBOOTSTRAPPARA=?</b>                                 | Response<br><b>+MIPLBOOTSTRAPPARA: (list of supported &lt;value&gt;),( list of supported &lt;rebootFlag&gt;)</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Read Command<br><b>AT+MIPLBOOTSTRAPPARA?</b>                                  | Response<br><b>+MIPLBOOTSTRAPPARA: &lt;value&gt;</b><br><br><b>OK</b><br><br>Parameters<br>See Write Command   |
| Write Command<br><b>AT+MIPLBOOTSTRAPPARA=&lt;value&gt;,&lt;rebootFlag&gt;</b> | Response<br><b>OK</b><br>or<br><b>+CIS ERROR: &lt;err&gt;</b><br><br>Parameters<br><b>&lt;value&gt;</b> Integer, the flag of connecting bootstrap server when register to Onenet<br>0 No need to connect to bootstrap<br>1 Have to connect to bootstrap<br><b>&lt;rebootFlag&gt;</b> Integer, reboot flag<br>0 Not reboot<br>1 Need to reboot<br>Module will reboot only when the parameter of <rebootFlag> is set to "1" and it is different from the value by query result of "AT+MIPLBOOTSTRAPPARA?". |

|                       |  |
|-----------------------|--|
| Parameter Saving Mode | AUTO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note<br>It applies only before OneNet version of V2.1.1. |

#### 14.2.18 +MIPLREAD Read Request to User

| +MIPLREAD Read Request to User |   |
|--------------------------------|---|
|                                | Response<br><b>+MIPLREAD: &lt;id&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;</b>   |
|                                | Parameters<br><b>&lt;id&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 |

#### 14.2.19 +MIPLWRITE Write Request to User

| +MIPLWRITE Write Request to User |   |
|----------------------------------|---|
|                                  | Response<br><b>+MIPLWRITE:<br/>&lt;id&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>   |
|                                  | Parameters<br><b>&lt;id&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<br><b>&lt;resourceid&gt;</b> Integer, resource id<br><b>&lt;valuetype&gt;</b> Integer, write data value type<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Bool<br><b>&lt;len&gt;</b> Integer, write data length. It can be omitted, if valuetype is Integer or Float, or Bool<br><b>&lt;value&gt;</b> Integer, write data value<br><b>&lt;flag&gt;</b> Integer, message flag |

|  |   |
|--|---|
|  | 1 First message<br>2 Middle message<br>0 Last message<br><index> Integer, message index, from 0 to 1024 |
|--|---|

#### 14.2.20 +MIPLEXECUTE Execute Request to User

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

#### 14.2.21 +MIPLOBERVE Observe Request to User

| +MIPLOBERVE Observe Request to User |  |
|-------------------------------------|--|
|                                     | Response<br><b>+MIPLOBERVE:</b><br><id>,<msgid>,<flag>,<objectid>,<instanceid>,<resourceid>  |
|                                     | Parameters<br><id> Integer, OneNET instance returned by AT+MIPLCREATE<br><msgid> Integer, message id<br><flag> Integer, observe flag.<br>1 Indicates observe<br>0 Indicates cancel observe<br><objectid> Integer, object id<br><instanceid> Integer, instance id, observe all resources of all instances of the object if instanceid equals -1<br><resourceid> Integer, resource id, observe all resources of the instance if resourceid equals -1 |

#### 14.2.22 +MIPLDISCOVER Discover request to User

| +MIPLDISCOVER Discover request to User |   |
|--|---|
|  | Response<br><b>+MIPLDISCOVER:</b> <id>,<msgid>,<objectid> |



|  |  |
|--|--|
|  | <p>Parameters</p> <p>&lt;id&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> |
|--|--|

#### 14.2.23 +MIPLPARAMETER Set Parameter Request to User

| +MIPLPARAMETER Set Parameter Request to User |  |
|--|--|
|  | <p>Response</p> <p><b>+MIPLPARAMETER:</b></p> <p>&lt;id&gt;,&lt;msgid&gt;,&lt;objectid&gt;,&lt;instanceid&gt;,&lt;resourceid&gt;,&lt;len&gt;,&lt;parameter&gt;</p>   |
|  | <p>Parameters</p> <p>&lt;id&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> |

#### 14.2.24 +MIPLEVENT Event Indication to User

| +MIPLEVENT Event Indication to User |  |
|-------------------------------------|--|
|                                     | <p>Response</p> <p><b>+MIPLEVENT: &lt;id&gt;,&lt;evtid&gt;[,&lt;extend&gt;]</b></p>  |
|                                     | <p>Parameters</p> <p>&lt;id&gt; Integer, OneNET instance returned by AT+MIPLCREATE</p> <p>&lt;evtid&gt; Integer, event id</p> <ol style="list-style-type: none"> <li>1 BOOTSTRAP_START</li> <li>2 BOOTSTRAP_SUCCESS</li> <li>3 BOOTSTRAP_FAILED</li> <li>4 CONNECT_SUCCESS</li> <li>5 CONNECT_FAILED</li> <li>6 REG_SUCCESS</li> <li>7 REG_FAILED</li> <li>8 REG_TIMEOUT</li> <li>9 LIFETIME_TIMEOUT</li> <li>10 STATUS_HALT</li> <li>11 UPDATE_SUCCESS</li> <li>12 UPDATE_FAILED</li> </ol> |

|  |  |                  |
|--|--|------------------|
|  | 13   | UPDATE_TIMEOUT   |
|  | 14   | UPDATE_NEED      |
|  | 15   | UNREG_DONE       |
|  | 20   | RESPONSE_FAILED  |
|  | 21   | RESPONSE_SUCCESS |
|  | 25   | NOTIFY_FAILED    |
|  | 26   | NOTIFY_SUCCESS   |
|  | <extend> Integer, extend parameter [option]                    |                  |
|  | The events of RESPONSE_FAILED and NOTIFY_FAILED can take msgid |                  |
|  | The events of UPDATE_NEED can take LIFETIME(unit is second)    |                  |
|  | The events of RESPONSE_SUCCESS can take ack                    |                  |

## 15 AT Commands for NVRAM

### 15.1 Overview of AT Commands for NVRAM Command

| Command    | Description                               |
|------------|---|
| AT+CNVMR   | Read data from NVRAM                      |
| AT+CNVMW   | Write data to NVRAM                       |
| AT+CNVMIVD | Invalidate a specific data item in NVRAM  |
| AT+CNVMGET | Get all Customer Data Item IDs from NVRAM |

### 15.2 Detailed Descriptions of AT Commands for NVRAM Command

#### 15.2.1 AT+CNVMR Read Data from NVRAM

| AT+CNVMR Read Data from NVRAM                  |   |
|--|---|
| Test Command<br>AT+CNVMR=?                     | <p>Response</p> <p>+CNVMR: "Data item name"</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>   |
| Write Command<br>AT+CNVMR=<d<br>ata_item_name> | <p>Response</p> <p>+CNVMR:<br/>&lt;read_status&gt;[,&lt;data_item_name&gt;,&lt;length&gt;,&lt;nvrn_data&gt;]</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;read_status&gt; If the succeeds,it is 0.Otherwise,it is the error code.<br/>-4 means the data item wasn't found by the NVRAM.<br/>There may be other error codes.</p> <p>&lt;data_item_name&gt; A string parameter which indicates the nvrn data item name,the string length can be from 1 to 20.</p> <p>&lt;length&gt; Integer,the length of the &lt;data_item_name&gt; item NVRAM Data.</p> <p>&lt;nvrn_data&gt; A string parameter which indicates the nvrn data.</p> |
| Parameter Saving Mode                          | NO_SAVE   |

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

### 15.2.2 AT+CNVMW Write Data to NVRAM

| AT+CNVMW Write Data to NVRAM                                    |   |
|---|---|
| Test Command<br>AT+CNVMW=?                                      | <p>Response</p> <p>+CNVMW: "Data item name","Data item value",(1-1024)</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p>  |
| Write Command<br>AT+CNVMW=<data_item_name>,<nvrn_data>,<length> | <p>Response</p> <p>+CNVMW: &lt;write_status&gt;</p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>&lt;write_status&gt; If the succeeds,it is 0.Otherwise,it is the error code.</p> <p>-7 Means no enough customer NVRAM space.</p> <p>There may be other error codes.</p> <p>&lt;data_item_name&gt; A string parameter which indicates the data item name you want to write,the string length can be from 1 to 20.</p> <p>&lt;nvrn_data&gt; A string parameter which indicates the data you want to write in to nvrn, the data length can be from 1 to 1024.</p> <p>&lt;length&gt; Integer,the length of the &lt;nvrn_data&gt;,can be from 1 to 1024.</p> |
| Parameter Saving Mode   | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

### 15.2.3 AT+CNVMIVD Invalidate a Specific Data Item in NVRAM

| AT+CNVMIVD Invalidate a Specific Data Item in NVRAM |   |
|---|---|
| Test Command<br>AT+CNVMIVD=?                        | <p>Response</p> <p>+CNVMIVD: "Data item name"</p> <p><b>OK</b></p> <p>Parameters</p> <p>See Write Command</p> |

|  |  |
|--|--|
| Write Command<br><b>AT+CNVMIVD=</b><br><b>&lt;data_item_name&gt;</b> | <p>Response</p> <p><b>+CNVMIVD: &lt;status&gt;</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>  |
|  | <p>Parameters</p> <p><b>&lt;status&gt;</b> If the succeeds,it is 0.Otherwise,it is the error code.<br/>-4 Means the data item wasn't found by the NVRAM.<br/>There may be other error codes.</p> <p><b>&lt;data_item_name&gt;</b> A string parameter which indicates the data item name you want to write,the string length can be from 1 to 20.</p> |
| Parameter Saving Mode  | NO_SAVE  |
| Max Response Time  | -  |
| Reference  | Note   |

#### 15.2.4 AT+CNVMGET Get all Customer Data Item IDs from NVRAM

| <b>AT+CNVMGET Get all Customer Data Item IDs from NVRAM</b> |   |
|---|---|
| Execution Command<br><b>AT+CNVMGET</b>                      | <p>Response</p> <p>If successful, return:</p> <p><b>+CNVMGET: &lt;id&gt;,&lt;group_name&gt;,&lt;data_item_name&gt;</b></p> <p><b>OK</b></p> <p>If no customer NVRAM data item, return:</p> <p><b>+CNVMGET: NULL</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p>  |
|   | <p>Parameters</p> <p><b>&lt;id&gt;</b> The id of the data item.</p> <p><b>&lt;group_name&gt;</b> A string parameter which indicates the group name you have wrote in to nvram.</p> <p><b>&lt;data_item_name&gt;</b> A string parameter which indicates the data item name you have wrote in to nvram with AT+CNVMW.</p> |
| Parameter Saving Mode                                       | NO_SAVE   |
| Max Response Time   | -   |
| Reference   | Note  |

## 16 AT Commands for CT IOT Platform

### 16.1 Overview of AT Commands for CT IOT Platform

| Command        | Description                       |
|----------------|-----------------------------------|
| AT+CM2MCLINEW  | Register to CT IOT Platform       |
| AT+CM2MCLISEND | Send data to CT IOT Platform      |
| AT+CM2MCLIDEL  | Deregister to CT IOT Platform     |
| AT+CM2MCLIGET  | Get the lastest 6 received data   |
| +CM2MCLI       | CT IOT client notification        |
| +CM2MCLIRECV   | Receive data from CT IOT platform |

### 16.2 Detailed Descriptions of AT Commands for CT IOT Platform

#### 16.2.1 AT+CM2MCLINEW Register to CT IOT Platform

| AT+CM2MCLINEW Register to CT IOT Platform   |  |
|---|--|
| Write Command<br><b>AT+CM2MCLINEW=&lt;server&gt;,&lt;port&gt;,&lt;endpoint&gt;[,&lt;lifetime&gt;[,&lt;pskid&gt;,&lt;psk&gt;]]</b> | <p>Response</p> <p><b>OK</b></p> <p><b>+CM2MCLI: 1</b></p> <p><b>+CM2MCLI: 4</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;server&gt;</b> String, LwM2M server IP address of CT IOT platform..</p> <p><b>&lt;port&gt;</b> Integer, LwM2M server port of CT IOT platform.</p> <p><b>&lt;endpoint&gt;</b> String, Endpoint name, the format should be "xxx", xxx is the IMEI of device.</p> <p><b>&lt;lifetime&gt;</b> Integer, The time interval to send "update registration" to CT IOT platform, Don't update by default.</p> <p><b>&lt;pskid&gt;</b> String, Mandatory for DTLS register,use device's IMEI for CT IOT platform.</p> <p><b>&lt;psk&gt;</b> String, Mandatory for DTLS register,supply by CT IOT platform.</p> |
| Parameter Saving Mode   | NO_SAVE  |
| Max Response Time   | -  |

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

### 16.2.2 AT+CM2MCLISEND Send Data to CT IOT Platform

| AT+CM2MCLISEND Send Data to CT IOT Platform         |   |
|---|---|
| Write Command<br><b>AT+CM2MCLISEND=&lt;data&gt;</b> | <p>Response</p> <p><b>OK</b></p> <p><b>+CM2MCLI: 5</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p><b>&lt;data&gt;</b> String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.</p> |
| Parameter Saving Mode                               | NO_SAVE   |
| Max Response Time                                   | -   |
| Reference   |   |

### 16.2.3 AT+CM2MCLIDEL Deregister to CT IOT Platform

| AT+CM2MCLIDEL Deregister to CT IOT Platform |  |
|---|--|
| Execute Command<br><b>AT+CM2MCLIDEL</b>     | <p>Response</p> <p><b>OK</b></p> <p><b>+CM2MCLI: 3</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>NONE</p> |
| Parameter Saving Mode                       | NO_SAVE  |
| Max Response Time                           | -  |
| Reference                                   | Note   |

### 16.2.4 AT+CM2MCLIGET Get the Lastest 6 Received Data

| AT+CM2MCLIGET Get the Lastest 6 Received Data |  |
|---|--|
| Read Command<br><b>AT+CM2MCLIGET</b>          | <p>Response</p> <p><b>No Data!</b></p> |

|                       |  |
|-----------------------|--|
| <b>GET?</b>           | <p><b>OK</b></p> <p>or</p> <p><b>+CM2MCLIRECV: &lt;data&gt;</b></p> <p><b>[ [+CM2MCLIRECV: &lt;data&gt;]</b></p> <p><b>...]</b></p> <p><b>OK</b></p> <p>or</p> <p><b>ERROR</b></p> <p>Parameters</p> <p>NONE</p> |
| Parameter Saving Mode | NO_SAVE  |
| Max Response Time     | -  |
| Reference             | Note   |

#### 16.2.5 +CM2MCLI CT IOT Client Notification

| <b>+CM2MCLI CT IOT Client Notification</b> |   |
|--|---|
|  | <p>Response</p> <p><b>+CM2MCLI: &lt;n&gt;</b></p> <p>Parameters</p> <p><b>&lt;n&gt;</b> Integer, Notification.</p> <ul style="list-style-type: none"> <li>0 Response error</li> <li>1 Device registered to CT IOT platform successfully</li> <li>2 Device updated registration to CT IOT platform successfully</li> <li>3 Device deregistered to CT IOT platform successfully</li> <li>4 Device received object 19 observation successfully from CT IOT platform</li> <li>5 Device sent data to CT IOT platform</li> <li>6 Reserve,define later</li> <li>7 Device registered to CT IOT platform failed</li> </ul> |

#### 16.2.6 +CM2MCLIRECV Receive data from CT IOT Platform

| <b>+CM2MCLIRECV Receive data from CT IOT platform</b> |   |
|---|---|
|   | <p>Response</p> <p><b>+CM2MCLIRECV: &lt;data&gt;</b></p> <p>Parameters</p> <p><b>&lt;data&gt;</b> String, HEX format, should be even, the supported characters are 0~9, A~F, a~f.</p> |



## 17 AT Commands for Network Command-DM

### 17.1 Overview of AT Commands for Network Command-DM

| Command        | Description             |
|----------------|-------------------------|
| AT+DMCONFIGEXT | Config paramters for DM |
| AT+DMSET       | Set DM state            |

### 17.2 Detailed Descriptions of AT Commands for Network Command-DM

#### 17.2.1 AT+DMCONFIGEXT Configure paramters for DM

| AT+DMCONFIGEXT Configure paramters for DM                             |  |
|---|--|
| Test Command<br>AT+DMCONFIGEXT=?                                      | <p>Response</p> <p><b>+DMCONFIGEXT:</b> (0-255).(0-255).(0-255).(0-255),(0,1),<br/>"appkey","pwd",(list of supported &lt;lifetime&gt;)</p> <p><b>OK</b></p> <p>Parameters<br/>See Write Command</p>  |
| Write Command<br>AT+DMCONFIGEXT=<addr>,<bs>,<appkey>,<pwd>,<lifetime> | <p>Response</p> <p><b>OK</b><br/>or<br/><b>ERROR</b></p> <p>Parameters</p> <p>&lt;addr&gt; String, DM host IP address</p> <p>&lt;bs&gt; Integer ,DM host bootstrap value</p> <p>0 Bootstrap disabled</p> <p>1 Bootstrap enabled</p> <p>Such as: 117.161.2.7, bs value is set to 0</p> <p>&lt;appkey&gt; String , appkey for register DM</p> <p>&lt;pwd&gt; String , secret key for register DM</p> <p>&lt;lifetime&gt; Integer, lifetime for register DM</p> |
| Parameter Saving Mode   | AUTO_SAVE  |
| Max Response Time   | -  |
| Reference   |  |

## 17.2.2 AT+DMSET Set DM State

| AT+DMSET Set DM State                          |  |
|--|--|
| Test Command<br><b>AT+DMSET=?</b>              | Response<br><b>+DMSET: (0-1)</b>   |
|  | <b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Read Command<br><b>AT+DMSET?</b>               | Response<br><b>+DMSET: &lt;value&gt;</b>                                     |
|  | <b>OK</b>  |
|  | Parameters<br>See Write Command  |
| Write Command<br><b>AT+DMSET=&lt;value&gt;</b> | Response<br><b>OK</b><br>or<br><b>ERROR</b>                                  |
|  | Parameters<br><value> Integer, set DM on or off state<br>0 DM off<br>1 DM on |
| Parameter Saving Mode                          | AUTO_SAVE_REBOOT   |
| Max Response Time                              | -  |
| Reference                                      |  |

## 18 AT Commands for FOTA

### 18.1 Overview of AT Commands for FOTA

| Command  | Description    |
|----------|----------------|
| AT+CFOTA | FOTA Operation |
| AT+CFLE  | Flash Erase    |
| AT+CFLW  | Flash Write    |
| AT+CFLR  | Flash Read     |

### 18.2 Detailed Descriptions of AT Commands for FOTA

#### 18.2.1 AT+CFOTA FOTA Operation

| AT+CFOTA FOTA Operation                 |   |
|---|---|
| AT+CFOTA=<mode>[,version][,<len>,<md5>] | <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;mode&gt;</b></p> <ol style="list-style-type: none"> <li>1 Download and update differential package by TCP</li> <li>2 Download differential package by TCP ,not update</li> <li>3 Update differential package after <b>&lt;mode&gt;=2</b></li> <li>4 Report update result to FOTA server</li> <li>5 Update differential package after local download</li> </ol> <p><b>&lt;len&gt;</b> The update differential package length</p> <p><b>&lt;md5&gt;</b> The update differential package MD5 check value</p> |
| Parameter Saving Mode                   | NO_SAVE   |
| Reference                               | <p>Note</p> <ul style="list-style-type: none"> <li>● When <b>&lt;mode&gt;=1</b> or <b>2</b><br/>The PDP connect should be OK.<br/>Domain name resolution should be OK.</li> <li>● <b>&lt;version&gt;</b> The new version which customer want to update, if you omit it ,the module will update to the newest version in the OTA server.<br/>The <b>&lt;version&gt;</b> just support when <b>&lt;mode&gt;=1</b> or <b>2</b>.</li> <li>● When <b>&lt;mode&gt;=5</b></li> </ul>  |

|  |  |
|--|--|
|  | <p>need parameter&lt;len&gt;and&lt;md5&gt;</p> <p>local download need use AT+CFLE and AT+CFLW.</p> |
|--|--|

### 18.2.2 AT+CFLE Flash Erase

| AT+CFLE Flash Erase         |   |
|-----------------------------|---|
| AT+CFLE=<mode>,<addr>,<num> | <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;mode&gt;</b>    0    Erase FOTA update partition<br/>                     1    Erase flash reserved partition</p> <p><b>&lt;addr&gt;</b>    0    FOTA partition address is fixed when &lt;mode&gt;=0<br/>                     138346496-138412032(0x083F0000-0x08400000)<br/>                     Flash reserved partition valid address area, the value should<br/>                     be decimal format, when &lt;mode&gt;=1</p> <p><b>&lt;num&gt;</b>    1-145    flash block number when&lt;mode&gt;=0<br/>                     1-16    flash block number when&lt;mode&gt;=1</p> |
| Parameter Saving Mode       | NO_SAVE   |
| Reference                   | <p>Note</p> <ul style="list-style-type: none"> <li>● FOTA partition                    0x0830F000-0x083A5000,600KB</li> <li>● FOTA update partition        0x08313000- 0x083A4000,580KB</li> <li>● FLASH reserved partition    0x083F0000-0x08400000,64KB</li> <li>● The size one flash block is 4KB</li> </ul>   |

### 18.2.3 AT+CFLW Flash Write

| At+CFLW Flash Write                            |   |
|--|---|
| AT+CFLW=<mode>,<addr>,<len>,<offset>,<timeout> | <p>Response</p> <p>"&gt;",</p> <p>Then enter data mode for inputting data until &lt;len&gt; is meet, and write data to flash.</p> <p><b>OK</b></p> <p>If&lt;timeout&gt; expired ,cancel the operation</p> <p><b>ERROR</b></p> <p>If error is related to ME functionality:</p> |

|                       |  |
|-----------------------|--|
|                       | <p>+CME ERROR: &lt;err&gt;</p> <hr/> <p>Parameters</p> <ul style="list-style-type: none"> <li>&lt;bmode&gt;      0   Write FOTA update partition<br/>               1   Write Flash reserved partition</li> <li>&lt;baddr&gt;       0   FOTA partition address is fixed when &lt;bmode&gt;=0<br/>                138346496-138412032(0x083F0000-0x08400000)<br/>Flash reserved partition valid address area, the value<br/>should be decimal format</li> <li>&lt;blen&gt;         The data-length for writing, maximum 512 bytes each time</li> <li>&lt;boffset&gt; The offset added for writing<br/>not exceeding 580KB when &lt;bmode&gt;=0<br/>not exceeding 64KB when &lt;bmode&gt;=1</li> <li>&lt;btimeout&gt; Timeout for writing, unit: s , maximum 100s</li> </ul> |
| Parameter Saving Mode | NO_SAVE  |
| Reference             | Note <ul style="list-style-type: none"> <li>● Before write flash ,should erase flash first</li> </ul>  |

#### 18.2.4 AT+CFLR Flash Read

|                       |  |
|-----------------------|--|
| AT+CFLR               | Flash Read   |
| AT+CFLR=<addr>,<len>  | <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;addr&gt;</b> 138346496-138412032(0x083F0000-0x08400000) Flash reserved partition valid address area, the value should be decimal format 0x08313000- 0x083A4000 FOTA update partition.</p> <p><b>&lt;len&gt;</b> The data-length for reading, maximum 512 bytes each time</p> |
| Parameter Saving Mode | NO_SAVE  |
| Reference             | <p>Note</p> <ul style="list-style-type: none"> <li>FOTA update partition not support read.</li> </ul>  |

## 19 Supported Unsolicited Result Codes

### 19.1 Summary of CME ERROR Codes

Final result code +**CME ERROR: <err>** indicates different meaning. 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:

#### 19.1.1 CME Error Codes Related to mobile equipment or network

| 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        |
| 48  | hidden key required                           |
| 50  | Incorrect Parameters                          |
| 100 | Unknown                                       |

### 19.1.2 CME Error Codes related to PSD and Packet Domain

Final result code **+CME ERROR: <err>** indicates an error related to PSD and Packet Domain. 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                                   |
|---------------|---|
| 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                      |
| 151           | Last PDN Disconnection not allowed        |
| 577           | PSD - activation rejected by GGSN         |
| 578           | PSD - unspecified activation rejection    |

|     |   |
|-----|---|
| 579 | PSD - bad code or protocol rejection      |
| 580 | PSD - can't modify address                |
| 581 | PSD - CHAP close                          |
| 582 | PSD - profile (cid) currently unavailable |
| 583 | PSD - a profile (cid) is currently active |
| 584 | PSD - combined services not allowed       |
| 585 | PSD - conditional IE error                |
| 586 | PSD - context activation rejected         |
| 587 | PSD - duplicate TI received               |
| 588 | PSD - feature not supported               |
| 589 | PSD - service not available               |
| 590 | PSD - unknown IE from network             |
| 591 | PSD - implicitly detached                 |
| 592 | PSD - insufficient resources              |
| 593 | PSD - invalid activation state (0-1)      |
| 594 | PSD - invalid address length              |
| 595 | PSD - invalid character in address string |
| 596 | PSD - invalid cid value                   |
| 597 | PSD - invalid dial string length          |
| 598 | PSD - mode value not in range             |
| 599 | PSD - invalid MAND information            |
| 600 | PSD - SMS service preference out of range |
| 601 | PSD - invalid TI value                    |
| 602 | PSD - IPCP negotiation timeout            |
| 603 | PSD - LCP negotiation timeout             |
| 604 | PSD - LLC error                           |
| 605 | PSD - LLC or SNDCP failure                |
| 606 | PSD - lower layer failure                 |
| 607 | PSD - missing or unknown APN              |
| 608 | PSD - mobile not ready                    |
| 609 | PSD- MS identity not in network           |
| 610 | PSD- MSC temporarily not reachable        |
| 611 | PSD- message incompatible with state      |
| 612 | PSD- message type incompatible with state |
| 613 | PSD- unknown message from network         |



|     |  |
|-----|--|
| 614 | PSD- NCP close                                 |
| 615 | PSD- network failure                           |
| 616 | PSD- no echo reply                             |
| 617 | PSD- no free NSAPIs                            |
| 618 | PSD- processing of multiple cids not supported |
| 619 | PSD- no PDP context activated                  |
| 620 | PSD- normal termination                        |
| 621 | PSD- NSAPI already used                        |
| 622 | PSD- address element out of range              |
| 623 | PSD- PAP close                                 |
| 624 | PSD- PDP context w/o TFT already activated     |
| 625 | PSD- pdp type not supported                    |
| 626 | PSD- peer refuses our ACCM                     |
| 627 | PSD- peer refuses our IP address               |
| 628 | PSD- peer refuses our MRU                      |
| 629 | PSD- peer re-requested CHAP                    |
| 630 | PSD- profile (cid) not defined                 |
| 631 | PSD- unspecified protocol error                |
| 632 | PSD- QOS not accepted                          |
| 633 | PSD- QOS validation fail                       |
| 634 | PSD- reactivation required                     |
| 635 | PSD- regular deactivation                      |
| 636 | PSD- semantic error in TFT operation           |
| 637 | PSD- semantic errors in packet filter          |
| 638 | PSD- semantically incorrect message            |
| 639 | PSD- service type not yet available            |
| 640 | PSD- syntactical error in TFT operation        |
| 641 | GPRS - syntactical errors in packet filter     |
| 642 | PSD- too many RXJs                             |
| 643 | PSD- unknown PDP address or type               |
| 644 | PSD- unknown PDP context                       |
| 645 | PSD- user authorization failed                 |
| 646 | PSD- QOS invalid parameter                     |
| 647 | PSD- FDN failure                               |
| 649 | PSD- bad pdp context parameters                |

|     |   |
|-----|---|
| 650 | PSD- PDPcontext already active  |
| 651 | PSD- LCP termination negotiation timeout  |
| 652 | more than one double colon in IPv6 address  |
| 653 | IPv6 address ended with part of an IPv4 address   |
| 654 | IPv6 address used dotted-decimal form outside an IPv4 address                               |
| 655 | in an IPv6 address, a byte of an IPv4 address was too big, causing overflow                 |
| 656 | in an IPv6 address, a byte of an IPv4 address was missing                                   |
| 657 | in an IPv6 address, a byte of an IPv4 address was more than 255                             |
| 658 | in an IPv6 address, a byte pair was more than hex ffff                                      |
| 659 | in an IPv6 address, a byte of an IPv4 address was too short or contained invalid characters |
| 660 | an IPv6 address was too short or contained invalid characters                               |
| 661 | in an IPv6 address, a byte pair was too big, causing overflow                               |
| 662 | an IPv6 address started with a single colon   |
| 663 | an IPv6 address ended with a single colon   |
| 664 | an IPv6 address contained an IPv4 address other than at the end                             |
| 665 | an IPv6 address was too long  |
| 666 | an IPv6 address was followed by invalid characters  |
| 670 | PSD - operator Determined Barring   |
| 671 | PSD - activation rejected by GW or PDNGW  |
| 672 | PSD – PTI already in use  |
| 673 | PSD – EPS Bearer Context without TFT already activated                                      |
| 674 | PSD - PTI mismatch  |
| 675 | PSD - PDN Type IPV4 only allowed  |
| 676 | PSD – PDN Type IPV6 only allowed  |
| 677 | PSD – single address bearers only allowed   |
| 678 | PSD – ESM information not received  |
| 679 | PSD – PDN connection does not exist   |
| 680 | PSD – multiple PDN connection not allowed for one APN                                       |
| 681 | PSD – collision with network initiated request  |
| 682 | PSD – unsupported QCI value   |
| 683 | PSD – invalid PTI value   |
| 684 | PSD – incompatible APN restriction value  |
| 685 | PSD – reactivation request  |
| 690 | LTE - IMSI unknown in HSS   |

|     |   |
|-----|---|
| 691 | LTE - illegal UE                          |
| 692 | LTE - EPS service not allowed             |
| 693 | LTE - EPS and non EPS Service not allowed |
| 694 | LTE - UE ID cannot be derived             |
| 695 | LTE - EPS tracking area not allowed       |
| 696 | LTE - roaming not allowed in TA           |
| 697 | LTE - roaming not allowed in PLMN         |
| 698 | LTE - no suitable cells in TA             |
| 699 | LTE - CS domain not available             |
| 700 | LTE - ESM failure                         |
| 701 | LTE - MAC failure                         |
| 702 | LTE - synch failure                       |
| 703 | LTE - congestion                          |
| 704 | LTE - UE security capability mismatch     |
| 705 | LTE - security mode rejected, unspecified |
| 706 | LTE - UE not authorized in CSG cell       |
| 707 | LTE – non-EPS authorization unacceptable  |
| 708 | LTE - CS domain temporarily unavailable   |
| 709 | LTE - no EPS bearer context activated     |
| 710 | PSD – PSD Mode not possible               |
| 711 | PSD – invalid connection type             |
| 712 | PSD – no free PSD bearer IDs              |
| 713 | PSD – no free PSD PTIs                    |
| 714 | PSD – unable to open data connection      |
| 715 | PSD- Incorrect username/password          |

### 19.1.3 CME Error Codes related to select TE character set

Final result code **+CME ERROR: <err>** indicates an error related to select TE character set. 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                  |
|---------------|--------------------------|
| 737           | +CSCS type not supported |
| 738           | +CSCS type not found     |

#### 19.1.4 CME Error Codes related to preferred operator list

Final result code +**CME ERROR: <err>** indicates an error related to preferred operator list. 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                           |
|---------------|-----------------------------------|
| 741           | must include <format> with <oper> |
| 742           | incorrect <oper> format           |
| 743           | <oper> length too long            |
| 744           | SIM full                          |
| 745           | unable to change PLMN list        |
| 746           | network operator not recognized   |
| 747           | access technology missing         |
| 748           | access technology not supported   |

#### 19.1.5 CME Error Codes related to Restricted/Generic SIM Access

Final result code +**CME ERROR: <err>** indicates an error related to Restricted/Generic SIM Access. 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                            |
|---------------|------------------------------------|
| 749           | invalid command length             |
| 750           | invalid input string               |
| 751           | command not allowed for 3G SIM     |
| 752           | Invalid <pathid> parameter         |
| 753           | missing required commandparameter  |
| 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 |

#### 19.1.6 CME Error Codes related to Miscellaneous Proprietary

Final result code +**CME ERROR: <err>** indicates an error related to Miscellaneous Proprietary.

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                                     |
|---------------|---|
| 720           | SIM toolkit menu has not been configured    |
| 721           | SIM toolkit already in use                  |
| 722           | SIM toolkit not enabled                     |
| 724           | MMI profile not updated                     |
| 725           | invalid SIM toolkit proactive command ID    |
| 726           | invalid SIM proactive command response data |
| 765           | invalid input value                         |
| 766           | unsupported value or mode                   |
| 767           | operation failed                            |
| 768           | multiplexer already active                  |
| 769           | unable to get control of required           |
| 770           | SIM invalid - network reject                |
| 772           | SIM powered down                            |
| 773           | SIM File not present                        |
| 794           | invalid input value                         |
| 795           | No valid GId                                |

### 19.1.7 CME Error Codes related to report Network State

Final result code +**CME ERROR: <err>** indicates an error related to report Network State. 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                        |
|---------------|--------------------------------|
| 840           | No Service state               |
| 841           | In cell search state           |
| 842           | ERRC is deactivated            |
| 843           | In cell reselection state      |
| 844           | In L1 test mode                |
| 845           | In reestablishment state       |
| 846           | In PSM state                   |
| 847           | No data transfer in idle state |

## 19.2 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                      |
| 8             | Operator determined barring                         |
| 10            | Call barred   |
| 21            | Short message transfer rejected                     |
| 27            | Destination out of service                          |
| 28            | Unidentified subscriber                             |
| 29            | Facility rejected                                   |
| 30            | Unknown subscriber                                  |
| 38            | Network out of order                                |
| 41            | Temporary failure                                   |
| 42            | Congestion  |
| 47            | Resources unavailable, unspecified                  |
| 50            | Requested facility not subscribed                   |
| 69            | Requested facility not implemented                  |
| 81            | Invalid short message transfer reference value      |
| 95            | Invalid message, unspecified                        |
| 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 |
| 111           | Protocol error, unspecified                         |
| 127           | Interworking, unspecified                           |
| 300           | ME failure  |
| 301           | SMS reserved  |
| 302           | operation not allowed                               |
| 303           | operation not supported                             |
| 304           | invalid PDU mode parameter                          |
| 305           | invalid text mode parameter                         |

|     |   |
|-----|---|
| 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                             |
| 330 | SMSC address unknown                    |
| 331 | no network                              |
| 332 | network timeout                         |
| 340 | no+CNMA acknowledgment expected         |
| 500 | Unknown                                 |
| 512 | SIM not ready                           |
| 513 | unread records on SIM                   |
| 515 | PS busy                                 |
| 516 | Couldn't read SMS parameters from SIM   |
| 517 | SM BL not ready                         |
| 518 | invalid parameter                       |
| 519 | ME temporary not available              |
| 528 | Invalid (non-hex) chars in PDU          |
| 529 | Incorrect PDU length                    |
| 530 | Invalid MTI                             |
| 531 | Invalid (non-hex) chars in address      |
| 532 | Invalid address (no digits read)        |
| 533 | Incorrect PDU length (UDL)              |
| 534 | Incorrect SCA length                    |
| 536 | Invalid First Octet (should be 2 or 34) |
| 537 | Invalid Command Type                    |
| 538 | SRR bit not set                         |
| 539 | SRR bit set                             |

540 Invalid User Data Header IE

### 19.3 Summary of CIS ERROR Codes

Final result code **+CIS ERROR: <err>** indicates an error related to OneNET. 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            |
|---------------|--------------------|
| 651           | Memory error       |
| 652           | Paramter error     |
| 653           | Unsupported format |
| 654           | SDK error          |
| 655           | Not find           |

### 19.4 Summary of Unsolicited Result Codes

| URC   | Description  | AT Command                           |
|---|--|--------------------------------------|
| *MATREADY: 1  |  |                                      |
| +CREG:<br><stat>[,<lac>,<ci>]   | There is a change in the MT network registration status or a change of the network cell.   | AT+CREG=<n>                          |
| +CSMINS: <n>,<SIM inserted>   | Indicates whether SIM card has been inserted.  | AT+CSMINS=1                          |
| +CENG:<br><cell>,"<arfcn>,<rxl>,<rxq><br>,<mcc>,<mnc>,<bsic>,<cellid>,<rla>,<txp>,<lac>,<TA>" | Report of network information.   | AT+CENG=<mode>[,<Ncell>]<br><mode>=2 |
| +CPIN: <code>   | Indicates whether some password is required or not.  | AT+CPIN                              |
| +CPIN: NOT READY  | SIM Card is not ready.   |                                      |
| +CPIN: NOT INSERTED   | SIM Card is not inserted.  |                                      |
| +CSQN: <rsi>,<ber>  | Displays signal strength and channel bit error rate when <rsi>,<ber>values change.   | AT+EXUNSOL="SQ",1                    |
| +CR: <serv>   | An intermediate result code is transmitted during connect negotiation when the TA has determined the speed and quality of service to be used, before | AT+CR=1                              |



|   |   |              |
|---|---|--------------|
|   | any error control or data compression reports are transmitted, and before any final result code (e.g. CONNECT) appears. |              |
| <b>NORMAL POWER DOWN</b>  | SIM7020 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>+CDNSGIP: 1,&lt;domain name&gt;,&lt;IP&gt;[,&lt;IP2&gt;]</b> | DNS successful  | AT+CDNSGIP   |
| <b>+CGREG: &lt;stat&gt;[,&lt;lac&gt;,&lt;ci&gt;]</b>            | Network Registration Status   | AT+CGREG=<n> |

## 20 AT Commands Examples

### 20.1 CoAP command

| Demonstration                             | Syntax   | Expect Result                               |
|---|--|---|
| Create CoAP client and get CoAP client ID | AT+CCOAPNEW=<br>"10.161.11.104",56<br>83,1           | +CCOAPNEW:1<br><br>OK                       |
| Get CoAP server counter                   | AT+CCOAPSEND<br>=1,12,"400141C7B<br>7636F756E746572" | OK  |
| Notify CoAP server counter "024" via URC  |  | +CCOAPNMI:<br>1,11,"60457233c02105ff303234" |

## 21 ATC Differences among SIM7020 Series

### 21.1 AT+CSCLK

| SIM7020C,SIM7020E,SIM7020G,SIM7060   | SIM7030                     |
|--|-----------------------------|
| AT+CSCLK=?<br>+CSCLK: (0-2)  | AT+CSCLK=?<br>+CSCLK: (0,2) |
| OK   | OK                          |
| <b>Difference:</b><br>SIM7030 only support the parameter <n> equal to 0 and 2. |                             |

### 21.2 AT\*MEDRXCFC

1752B07SIM7020E version and above supports the command.

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