



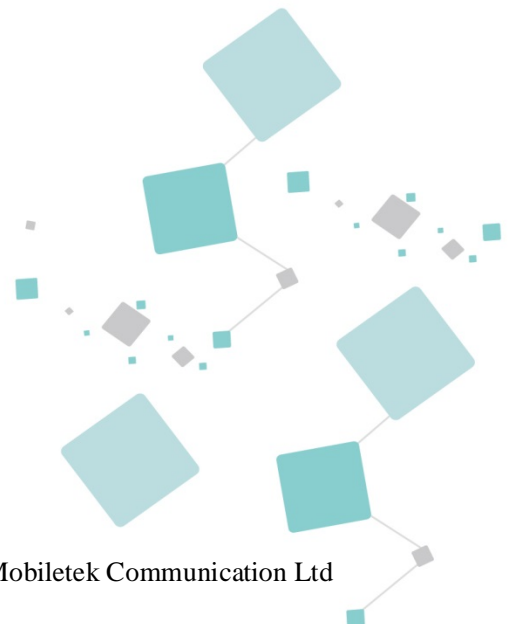
GSM_GNSS AT DOCUMENT

GSM/GPRS+GNSS Module Series

Version: V2.16

Date: 2018-6-20

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Revision History

| Date | Version | Description of change | Author |
|------------|---------|---|----------|
| 2016-7-27 | V1.0 | Initial | Chen Lei |
| 2016-8-12 | V1.1 | Added TCP/IP AT | |
| 2016-9-21 | V1.2 | Remove chapter "GATT Client AT Command" Added command "AT+ICF" Added command "AT+IFC" Remove command "AT+DS" Add FTP /HTTP/AUDIO commands | |
| 2016-10-19 | V1.3 | Added Email commands | |
| 2016-11-15 | V1.4 | Add command +CSCLK Add command +CPOWD | Caster |
| 2016-11-23 | V1.5 | Change format | Caster |
| 2016-12-7 | V1.6 | add AT+CIPMODE | Ym.lin |
| 2017-1-3 | V1.7 | Add AT+MGPSLOC and AT+MGPSTIME | Ym.lin |
| 2017-1-4 | V1.8 | Add AT+MGPSSTATUS, AT+MGPSURC | Ym.lin |
| 2017-1-6 | V1.9 | Modify AT+HTTTPARA=URL,"www.baidu.com", Modify FTP commands Add file system AT commands | Gd.yang |
| 2017-1-12 | V2.0 | Add AT+MJDR and AT+MJDCFG | k.chen |
| 2017-2-22 | V2.3 | Update At command | Caster |
| 2017-2-22 | V2.4 | Change formats | Caster |
| 2017-3-12 | V2.5 | Change formats | Caster |
| 2017-3-20 | V2.6 | Change formats | Caster |
| 2017-3-21 | V2.6 | Delete +CUSGPASTA command | Jiang |
| 2017-3-28 | V2.7 | Modified commands description | Caster |
| 2017-3-28 | V2.8 | Modified +SAPBR APN length maximum is 48 Delete +CMUX read mode Delete +CALA unused parameter Delete +CGQMIN command | Jiang |
| 2017-7-15 | V2.9 | Modified AT+SMTPSRV,AT+SMTPAUTH,AT+POP3LIST | l.yang |

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|------------|-------|--|---------|
| 2017-9-4 | V2.10 | Add AT+EMGR(Text mode) Read Message | Ym.lin |
| 2017-9-22 | V2.10 | Add AT+HTTPSSL command | I.jiang |
| 2017-9-25 | V2.10 | Add URC +ESMLA +ESCRI+ESIMS +EUSIM +ETESTSIM +EPWSC +ECCCH +ESACCH +ECELLINFO +ENWINFO | I.jiang |
| 2017-10-14 | V2.11 | Modified AT+CNUM description | Caster |
| 2017-10-24 | V2.12 | Modified +HTTTPARA,+CTTC,+CIPMODE,+CLIP,+CBC,+VTS,C STT,+CIPCCFG,+COPS,+CCWA,+CREG,+CVHU,+CIM I,+CMMS,+CSCS description | Jiang |
| 2017-11-29 | V2.13 | Add AT+FSPLAY and AT+FSSTOP | Caster |
| 2018-05-16 | V2.14 | Modify AT+ECERT, add AT+CIPSSLSKC | Gd.yang |
| 2018-06-13 | V2.15 | Delete +ECERT, Modify +CIPSSLSKC to +CIPSSLVM | Hc.liu |
| 2018-06-20 | V2.16 | Add ESIM commands: AT+CCHO AT+CCHC and AT+CGLA | Caster |

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1 Introduction

1.1 Overview

This document introduces the supported AT command set of L216 project.

We don't suggest using proprietary command in a multiple command. There might be abnormal situation occurs.

1.2 References

- [1] 3GPP TS 27.007 V3.13.0 (2003-03)
- [2] ETSI TS 27.005 V3.1.0 (2000-01)
- [3] ITU-T V.25 ter (07/1997)

2 V.25ter AT Commands

Overview of V.25ter AT Commands:

| AT Command | Description |
|-----------------|---|
| ATA | Answer an incoming call |
| ATD | Mobile originated call |
| ATE | Set AT command echo mode |
| ATH | Disconnect existing connection |
| ATI | Display product identification information |
| ATL | Set monitor speaker loudness |
| ATO | Switch from command mode to data mode |
| ATP | Select pulse dialing |
| ATQ | Set result code presentation mode |
| ATS0 | Set number of rings before automatically answering the call |
| ATS3 | Set command line termination character |
| ATS4 | Set response formatting character |
| ATS5 | Set command line editing character |
| ATS6 | Pause before blind dial |
| ATS7 | Set number of seconds to wait for connection completion |
| ATS8 | Comma dial modifier time |
| ATS10 | Automatic disconnect delay |
| ATT | Select tone dialing |
| ATV | Set DCE response format |
| ATX | Set connect result code format |
| ATZ | Reset default configuration |
| AT&F | Factory defined configuration |
| AT+GMI | Request manufacturer identification |
| AT+GMM | Request TA model identification |
| AT+GMR | Request TA revision identification of software |
| AT+IPR | Set TE-TA Local Data Flow Control |
| AT+GOI | Request global object identification |
| AT+IFC | Set TE-TA Local Data Flow Control |
| AT+ICF | Set local serial-port asynchronous character |
| AT+GCAP | Request complete capabilities list |

2.1 ATA Answer an Incoming Call

Answers and initiates a connection to an incoming call.

| Execution Command | Response |
|----------------------|--|
| ATA | CONNECT<text> TA switches to data mode. Response in case of voice call, if successfully connected OK Response if no connection NO CARRIER |
| Reference V.25ter | Note See also ATX |

2.2 ATD Mobile originated call

Initiates a phone connection, which may be data, facsimile (+FCLASS> 0), or voice (phone number terminated by semicolon). The phone number used to establish the connection will consist of digits and modifiers, or a stored number specification. ATD memory dial can originate call to phone number in entry location <n> (the memory storage of +CPBS setting will be used.). ATDL is used to dial LDN(last dialed number) and it will always dial as voice call.

| Execution Command | Response |
|------------------------|---|
| ATD<n>[:] | <p>If error is related to ME functionality +CME ERROR: <err></p> <p>If no dial tone and (parameter setting ATX2 or ATX4) NO DIALTONE</p> <p>If busy and (parameter setting ATX3 or ATX4) BUSY</p> <p>If a connection cannot be established NO CARRIER</p> <p>If the remote station does not answer NO ANSWER</p> <p>If connection successful and non-voice call. CONNECT<text> TA switches to data mode. Note: <text> output only if ATX<value> parameter setting with the <value>>0</p> <p>When TA returns to Command mode after call release OK</p> <p>If connection successful and voice call OK</p> |
| Reference V.25ter | <p>Note</p> <ul style="list-style-type: none"> ● Parameter "I" and "i" only if no *# code is within the dial string ● <n> is default for last number that can be dialed by ATDL ● *# codes sent with ATD are treated as voice calls. Therefore, the Command must be terminated with a semicolon ";" |

- See **ATX** Command for setting result code and call monitoring parameters.

The ATD abort ability described in V.25 5.6.1 is implemented, except for the ATD memory dial. Aborting of the command is accomplished by the transmission from the DTE to the DCE of any character before the response. In UCM project , ATD command will sent to MMI for SYNC.

Parameters are defined below:

| Parameters | Description |
|------------|--|
| <n> | String of dialing digits and optionally V.25ter modifiers dialing digits: 0-9, *, #, +, A, B, C Following V.25ter modifiers are ignored: ,(comma), T, P, I, W, @ |
| <;> | Only required to set up voice call , return to Command state |

2.3 ATE Set AT command echo mode

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command state.

| Execution Command | Response |
|-------------------------|-----------|
| ATE<value> | OK |
| Reference | Note |
| V.25ter | |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <value> | 0 Echo mode off <u>1</u> Echo mode on |

2.4 ATH Disconnect existing connection

Terminates a connection.

| Execution Command | Response |
|-------------------|-----------|
| ATH | OK |
| Reference | Note |
| V.25ter | |

2.5 ATI Display product identification information

Request Identification Information.

| | |
|----------------------|--|
| Execution Command | Response |
| ATI | <model> <model revision> OK |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|-------------------------------|---|
| <model> | Model , for example: L216 |
| <model revision> | model revision, for example: L216v02.02b01 |

2.6 ATL Set monitor speaker loudness

Set volume of the monitor speaker.

| | |
|-------------------------|--------------------------|
| Execution Command | Response |
| ATL<value> | OK |
| Reference V.25ter | Note No effect in GSM |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <value> | 0 Lowest speaker volume 1 Low speaker volume 2 Medium speaker volume 3 High speaker volume |

2.7 ATO Switch from command mode to data mode

Switch from on-line command mode to on-line data mode during an active call. If not in on-line command mode will Returns ERROR.

| Execution Command | Response |
|-------------------|---|
| ATO | <p>If connection is not successfully resumed</p> <p>CONNECT<text> else</p> <p>NO CARRIER else</p> <p>ERROR</p> |
| Reference | Note |
| V.25ter | |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <text> | <p>28800 Connected with data bit rate of 28800 bits/s (HSCSD)</p> <p>19200 Connected with data bit rate of 19200 bits/s (HSCSD)</p> <p>14400 Connected with data bit rate of 14400 bits/s (HSCSD)</p> <p>9600 Connected with data bit rate of 9600 bits/s</p> <p>4800 Connected with data bit rate of 4800 bits/s</p> <p>2400 Connected with data bit rate of 2400 bits/s</p> |

2.8 ATP Select pulse dialing

Select pulse dialing. (This setting is ignored.)

| Execution Command | Response |
|-------------------|------------------|
| ATP | OK |
| Reference | Note |
| V.25ter | No effect in GSM |

2.9 ATQ Set result code presentation mode

Set result code suppression mode.

| | |
|----------------------|--|
| Execution Command | Response |
| ATQ<n> | OK If value is 0 . (none) If value is 1 (because result codes are suppressed). ERROR For unsupported values (if previous value was Q0). (none) For unsupported values (if previous value was Q1). OK If <n>=1: (none) |
| Reference V.25ter | Note If use input ATQ, it is equal to ATQ1 by default |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | <u>0</u> DCE transmits result codes. 1 Result codes are suppressed and not transmitted |

2.10 ATS0 Set number of rings before automatically answering

This S-parameter controls the automatic answering feature of the DCE. If set to 0, automatic answering is disabled. If set to a non-zero value, the DCE shall cause the DCE to answer when the incoming call indication (ring) has occurred the number of times indicated by the value.

| | |
|-----------------------|--|
| Read Command | Response |
| ATS0? | <n> OK |
| Write Command | Response |
| ATS0=<n> | OK ERROR |
| Reference V.25ter | Note The setting of ATS0 applies both on SIM1 and SIM2. |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | <u>0</u> Automatic answering is disabled. 1-255 Number of rings the modem will wait for before answering the phone if a ring is detected. |

2.11 AT\$3 Set command line termination character

This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter (see the description of the V parameter for usage).

| | |
|------------------------|---------------------------------|
| Read Command | Response |
| AT\$3? | <n> OK |
| Write Command | Response |
| AT\$3=<n> | OK or ERROR |
| Reference V.25ter | Note Default 13=CR. |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | <u>13</u> Command line termination character |

2.12 ATS4 Set response formatting character

This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter (see the description of the V parameter for usage).

| | |
|-----------------------|-------------------------------|
| Read Command | Response |
| ATS4? | <n> OK |
| Write Command | Response |
| ATS4=<n> | OK ERROR |
| Reference V.25ter | Note Default 10=LF. |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | <u>10</u> Response formatting character |

2.13 AT\$5 Set command line editing character

This S-parameter represents the decimal IA5 value of the character recognized by the DCE as are quest to delete from the command line the immediately preceding character.

| | |
|-----------------------|---|
| Read Command | Response |
| ATS5? | <n> OK |
| Write Command | Response |
| ATS5=<n> | OK or ERROR |
| Reference V.25ter | Note Default 8, Backspace character (BS, IA5 0/8). |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | 0-8- 127 Set command line editing character to this value. |

2.14 AT\$6 Pause before blind dial

Pause before blind dialing. The command is ignored.

| | |
|------------------------|---|
| Read Command | Response |
| AT\$6? | <n> OK ERROR |
| Write Command | Response |
| AT\$6=<n> | OK or ERROR |
| Reference V.25ter | Note No effect in GSM |

Parameters are defined below:

| Parameters | Description |
|------------------|--------------|
| <n> | 0..999 Time. |

2.15 AT\$7 Set number of seconds to wait for connection completion

This parameter specifies the amount of time, in seconds, that the DCE shall allow between either answering a call (automatically or by the A command) or completion of signaling of call addressing information to network (dialing), and establishment of a connection with the remote DCE. If no connection is established during this time, the DCE disconnects from the line and returns a result code indicating the cause of the disconnection.

| | |
|------------------------|---|
| Read Command | Response |
| AT\$7? | <n> OK |
| Write Command | Response |
| AT\$7=<n> | OK ERROR |
| Reference V.25ter | Note <ul style="list-style-type: none"> ● If called party has specified a high value for AT\$0=<n>, call setup may fail. ● The correlation between AT\$7 and AT\$0 is important ● Example: Call may fail if AT\$7=30 and AT\$0=20. ● AT\$7 is only applicable to data call. |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | <u>1</u> -255 Number of seconds to wait for connection completion |

2.16 **ATS8** Comma dial modifier time

This parameter specifies the amount of time, in seconds, that the DCE shall pause, during signaling of call addressing information to the network (dialing), when a "," (comma) dial modifier is encountered in a dial string.

| | |
|-----------------------|--------------------------|
| Read Command | Response |
| ATS8? | <n> |
| | OK |
| Write Command | Response |
| ATS8=<n> | OK |
| | or |
| | ERROR |
| Reference V.25ter | Note No effect in GSM |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | 0 DCE does not pause when "," encountered in dial string. 1 to 255 Number of seconds to pause. Recommended default setting 2 DCE pauses two seconds when "," is encountered. |

2.17 **ATS10** Automatic disconnect delay

This parameter specifies the amount of time, in tenths of a second, that the DCE will remain connected to the line (off-hook) after the DCE has indicated the absence of received line signal. If the received line signal is once again detected before the time specified in S10 expires, the DCE remains connected to the line and the call continues.

| | |
|------------------------|---------------------------------|
| Read Command | Response |
| ATS10? | <n> OK |
| Write Command | Response |
| ATS10=<n> | OK or ERROR |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | 1-2-254 Number of tenths seconds of delay |

2.18 **ATT** Select tone dialing

This setting is ignored.

| | |
|----------------------|--------------------------|
| Execution Command | Response |
| ATT | OK |
| Reference V.25ter | Note No effect in GSM |

2.19 ATV Set DCE response format

Set DCE response format.

| | |
|-------------------------|---|
| Execution Command | Response |
| ATV<value> | When<value>=0 0 When<value>=1 OK |
| Read Command | Response |
| ATV? | OK |
| Test Command | Response |
| ATV=? | OK |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <value> | 0 Information response: <text><CR><LF> Short result code format: <numeric code><CR> <u>1</u> Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code> <CR><LF> |

2.20 ATX Set connect result code format

The setting of this parameter determines whether or not the DCE transmits particular result codes to the DTE. It also controls whether or not the DCE verifies the presence of dial tone when it first goes off-hook to begin dialing, and whether or not engaged tone (busy signal) detection is enabled.

However, this setting has no effect on the operation of the W dial modifier, which always checks for dial tone regardless of this setting, nor on the busy signal detection capability of the W and @ dial modifiers. See Table.

| Execution Command | Response |
|------------------------------------|-------------------------------------|
| ATX<value> | OK or ERROR |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <value> | <p>0 CONNECT result code is given upon entering online data state. Dial tone and busy detection are disabled.</p> <p>1 CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are disabled.</p> <p>2 CONNECT <text> result code is given upon entering online data state. Dial tone detection is enabled, and busy detection is disabled.</p> <p>3 CONNECT <text> result code is given upon entering online data state. Dial tone detection is disabled, and busy detection is enabled.</p> <p>4 CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are both enabled.</p> |

2.21 ATZ Reset to default configuration

Reset to default configuration

| Execution Command | Response |
|---------------------------|--|
| ATZ[<value>] | TA sets all current parameters to the user defined profile. OK or ERROR |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <value> | 0 Set current parameters to factory profile defaults. 1 Set current parameters to user profile defaults. |

2.22 AT&F Factory defined configuration

Set to factory-defined configuration

| Execution Command | Response |
|--------------------------------|-----------|
| AT&F[<value>] | OK |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <value> | 0 Set parameters to factory defaults. |

2.23 AT+GMI Request manufacturer identification

Same as AT+CGMI

| | |
|----------------------|--------------------|
| Test Command | Response |
| AT+GMI=? | OK |
| Execution Command | |
| AT+GMI | +CGMI: LYNQ |
| | OK |
| Reference V.25ter | Note |

2.24 AT+GMM Request TA model identification

Same as AT+CGMM

| | |
|----------------------|------------------------------|
| Test Command | Response |
| AT+GMM=? | OK |
| Execution Command | |
| AT+GMM | +CGMM: <module> |
| | OK |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|-----------------------------------|
| <modele> | Product model identification text |

2.25 AT+GMR Request TA revision identification of software

Same as AT+CGMR

| | |
|----------------------|---|
| Test Command | Response |
| AT+GMR=? | OK |
| Execution Command | Response |
| AT+GMR | +CGMR: <revision>, <date> OK |
| Reference V.25ter | Note |

Parameters are defined below:

| Parameters | Description |
|-------------------------|------------------------------|
| <revision> | Revision of software release |
| <date> | Date of software release |

2.26 AT+IPR Specifies the data rate

Specifies the data rate, in addition to 1200 bits/s or 9600 bits/s, at which the DCE will accept commands. May be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE.

| | |
|----------------------------|--|
| Test Command | Response |
| AT+IPR=? | +IPR: 0,300,1200,2400,4800,9600,14400,19200,28800,38400,57600,115200 OK |
| Read Command | Response |
| AT+IPR? | +IPR: <rate> OK |
| Write Command | Response |
| AT+IPR=<rate> | OK |
| Reference V.25ter | Note 1. Factory setting is AT+IPR=0 (auto-baud) . 2. Auto-baud not include: 14400 ,28800 bps |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <rate> | <u>0</u> ,300,1200,2400,4800,9600,14400,19200,28800,38400,57600,115200 |

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

AT+IFC Set TE-TA Local Data Flow Control

| | |
|--|---|
| Test Command | Response |
| AT+IFC=? | +IFC: (0-2),(0-2) OK |
| Read Command | Response |
| AT+ IFC? | This parameter setting determines the data flow control on the serial interface for data mode. OK Or Error |
| Write Command | Response |
| AT+IFC=[<dce_by_dte>[, <dte_by_dce>]] | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------------|--|
| <dce_by_dte> | Specifies the method will be used by TE at receive of data from TA <u>0</u> No flow control 1 Software flow control 2 Hardware flow control |
| <dte_by_dce> | Specifies the method will be used by TA at receive of data from TE <u>0</u> No flow control 1 Software flow control 2 Hardware flow control |

Example:

| Commands | Response |
|----------------|------------------------------------|
| AT+IFC? | +IFC: 0, 0 OK |

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2.28 AT+ICF Set local serial-port asynchronous character

Determines the local serial-port asynchronous character framing.

| | |
|---|--|
| Test Command | Response |
| AT+ICF=? | +ICF: (0-6), (0-3) OK |
| Read Command | Response |
| AT+ICF? | <format>, <parity> OK |
| Write Command | Response |
| AT+ICF=[<format>[,<parity>]] | OK or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------|---|
| format | 0 Auto-detect 1 8 Data bits, 2 Stop bits 2 8 Data bits, 1 Parity bit, 1 Stop bit <u>3</u> 8 Data bits, 1 Stop bit , Default setting 4 7 Data bits, 2 Stop bits 5 7 Data bits, 1 Parity bit, 1 Stop bit 6 7 Data bits, 1 Stop bit |
| parity | 0 Odd 1 Even 2 Mark <u>3</u> Space |

Example:

| | |
|----------------|------------------------------------|
| Commands | Response |
| AT+ICF? | +ICF: 3, 3 OK |

2.29 AT+GCAP Request complete capabilities list.

Request complete capabilities list.

| | |
|----------------------|--|
| Test Command | Response |
| AT+GCAP=? | OK |
| Execution Command | Response |
| AT+GCAP | TA reports a list of additional capabilities. +GCAP: +FCLASS, +CGSM OK |
| | Parameter |
| Reference V.25ter | |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <name> | <u>+CGSM</u> GSM function is supported <u>+FCLASS</u> FAX function is supported |

3 General commands

Overview of General AT Commands:

| AT Command | Description |
|----------------|--|
| AT+CGMI | Request manufacturer identification |
| AT+CGMM | Request model identification |
| AT+CGMR | Request revision identification |
| AT+CGSN | Request product serial number identification |
| AT+CSCS | Select TE character set |
| AT+CIMI | Request international mobile subscriber identity |
| AT+CMUX | Multiplexer Control |

3.1 AT+CGMI Request manufacturer identification

The command causes the phone to return one or more lines of information text <manufacturer> which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to.

| | |
|-------------------|---------------------------------|
| Test Command | Response |
| AT+CGMI=? | OK |
| Execution Command | Response |
| AT+CGMI | +CGMI: LYNQ OK |

3.2 AT+CGMM Request model identification

The command causes the phone to return one or more lines of information text <model> which is intended to permit the user of the ITAE/ETAE to identify the specific model of phone to which it is connected to.

| | |
|-------------------|--|
| Test Command | Response |
| AT+CGMM=? | OK |
| Execution Command | Response |
| AT+CGMM | +CGMM: <module> OK or +CME ERROR: <err> |

3.3 AT+CGMR Request revision identification

The command causes the phone to return a string containing information regarding SW version.

| | |
|-------------------|---|
| Test Command | Response |
| AT+CGMR=? | OK |
| Execution Command | Response |
| AT+CGMR | +CGMR: <revision>, <date> OK or +CME ERROR: <err> |

3.4 AT+CGSN Request product serial number identification

Returns the IMEI number of the phone.

| | |
|-------------------|--|
| Test Command | Response |
| AT+CGSN=? | OK |
| Execution Command | Response |
| AT+CGSN | <IMEI> OK or +CME ERROR: <err> |

3.5 AT+CSCS Select TE character set

Set command informs TA which character set <chset> is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

| | |
|------------------------------|--|
| Test Command | Response |
| AT+CSCS=? | +CSCS: (list of supported <chset>s) |
| Read Command | Response |
| AT+CSCS? | +CSCS: <chset> OK |
| Write Command | Response |
| AT+CSCS=<chset> | OK |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <chset> | <p>"IRA" international reference alphabet (ITU-T T.50 [13])</p> <p>"PCCP437" PC character set Code Page 437</p> <p>"GSM" GSM 7 bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF) problems</p> <p>"HEX" character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done.</p> <p>"PCCP437" PC character set Code Page 437</p> <p>"8859-1" ISO 8859 Latin character set</p> <p>"UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99</p> <p>"UCS2_0X81" The supported parameters are subject to change according to different compile directives (options).</p> |

3.6 AT+CIMI Request international mobile subscriber identity

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM which is attached to ME. Refer [1] 9.2 for possible <err> values.

| Execution Command | Response |
|-------------------|---|
| AT+CIMI | <IMSI> OK or +CME ERROR: <err> |
| AT+CIMI? | +CIMI: <IMSI> OK |
| Test Command | Response |
| AT+CIMI=? | OK |

3.7 AT+CMUX Multiplexer Control

| | |
|-----------------------------|---|
| Test Command | Response |
| AT+CMUX=? | +CMUX: (0) OK |
| Read Command | Response |
| AT+CMUX? | ERROR |
| Write Command | Response |
| AT+CMUX=<mode> | OK Or ERROR |
| | Note: L218E unsupport this function! |

Parameters are defined below:

| Parameters | Description |
|----------------------------|---|
| <Mode> | 0 Basic option |
| <subset> | The way in which the multiplexer control channel is set up, 0 UIH frames used only |
| < SPEED_PARA> | Transmission rate 1 9600 bits/t 2 19200 bits/t 3 38400 bits/t 4 57600 bits/t 5 115200 bit/s 6 230400 bits/t 7 460800 bits/t 8 921600 bits/t |
| <N1> | Maximum frame size 0-65535 Default: 512 |
| <T1> | Acknowledgement timer in units of ten milliseconds 1-255 Default:10 (100 ms) |
| <N2> | Maximum number of re-transmissions 0-255 Default:0 |
| <T2> | Max Response Timer for the multiplexer control channel In units of ten milliseconds 2-255 Default:30 |
| <T3> | Wake up Max Response Timers in seconds 1-255 Default:0 |

4 Call Control commands

Overview of Call Control AT Commands:

| AT Command | Description |
|----------------|---------------------------|
| AT+CSTA | Select type of address |
| AT+CHUP | Hang up call |
| AT+CR | Service reporting control |
| AT+CEER | Extended error report |
| AT+CRC | Cellular result code |
| AT+CSNS | Single Numbering Scheme |
| AT+CVHU | Voice Hang-up Control |

4.1 AT+CSTA Select type of address

Selects the type of number for further dialing commands (D) according to GSM/UMTS specifications.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+CSTA=? | +CSTA: (list of supported <type>s) OK |
| Write Command | Response |
| AT+CSTA=[<type>] | OK Or +CME ERROR: <err> |
| Read Command | Response |
| AT+CSTA? | +CSTA: <type> OK |
| Reference | Note If “+” appears at the beginning of <dial string>, the TON to network is set to 145, otherwise we use the setting of +CSTA. |

Parameters are defined below:

| Parameters | Description |
|------------|--|
| < type > | Type of address octet in integer format (refer 3GPP TS 24.008 [8] sub clause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129. |

4.2 AT+CHUP Hang up call

Request to hang up the current GSM call.

| | |
|-------------------|---|
| Test Command | Response |
| AT+CHUP=? | OK |
| Execution Command | Response |
| AT+CHUP | OK |
| Reference | Note In non-UCM projects (excluding Neptune Gemini with BT supported) projects, AT+CHUP can only hang up the call from the same source. In UCM project , this command will sent to MMI for SYNC. |

4.3 AT+CR Service reporting control

Set command controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the 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 the intermediate result code CONNECT is transmitted.

| | |
|-----------------------------|--|
| Test Command | Response |
| AT+CR=? | +CR: (list of supported <mode>s) OK |
| Read Command | Response |
| AT+CR? | +CR: <mode> OK |
| Write Command | Response |
| AT+CR=[<mode>] | OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 disables reporting 1 enables reporting |

4.4 AT+CEER Extended error report

Execution command causes the TA to return one or more lines of information text <report>, which offer the user of the TA an extended report of the reason for

- the failure in the last unsuccessful call setup (originating or answering) or in-call modification;
- the last call release;

| | |
|-------------------|--|
| Test Command | Response |
| AT+CEER=? | OK |
| Execution Command | Response |
| AT+CEER | +CEER: <cause>, <report> OK |
| Reference | Note For error cause other than those listed in GSM 04.08 annex H. +CEER: 128 ,"ERROR_CAUSE_UNKNOWN" will be given. If there is no error happened , +CEER: 0 ,"NONE" will be given. |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <cause> | Cause value listed in GSM 04.08 annex H. |
| <report> | String type describes cause value. |

4.5 AT+CRC Cellular result code

Set command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation is used. When enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING.

| | |
|------------------------------|---|
| Test Command | Response |
| AT+CRC=? | +CRC: (list of supported <mode>s) OK |
| Write Command | Response |
| AT+CRC=[<mode>] | OK |
| Read Command | Response |
| AT+CRC? | +CRC: <mode> OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 disables extended format 1 enables extended format |

4.6 AT+CSNS Single Numbering Scheme

Set command selects the bearer or teleservice to be used when mobile terminated single numbering scheme call is established. Parameter values set with +CBST command shall be used when <mode> equals to a data service.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+CSNS=? | +CSNS: (list of supported <mode>s) OK |
| Write Command | Response |
| AT+CSNS=[<mode>] | OK |
| Read Command | Response |
| AT+CSNS? | +CSNS: <mode> OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 voice 1 alternating voice/fax, voice first (TS 61) 2 fax (TS 62) 3 alternating voice/data, voice first (BS 61) 4 data 5 alternating voice/fax, fax first (TS 61) 6 alternating voice/data, data first (BS 61) 7 voice followed by data (BS 81) |

4.7 AT+CVHU Voice Hang-up Control

Set command selects whether ATH or "drop DTR" shall cause a voice connection to be disconnected or not. By voice connection is also meant alternating mode calls that are currently in voice mode.

| | |
|--|---|
| Test Command AT+CVHU=? | Response +CVHU: (list of supports <mode>) OK or ERROR |
| Write Command AT+CVHU=[<mode>] | Response OK or ERROR |
| Read Command AT+CVHU? | Response +CVHU: <mode> OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 "Drop DTR" ignored but OK response given. ATH disconnects. 1 "Drop DTR" and ATH ignored but OK response given. |

5 Network Service related commands

Overview of network service AT Commands:

| AT Command | Description |
|-------------------|---|
| AT+CNUM | Subscriber Number |
| AT+CREG | Network Registration |
| AT+COPS | Operator Selection |
| AT+CLCK | Facility Lock |
| AT+CPWD | Change Password |
| AT+CLIP | Calling line identification presentation |
| AT+CLIR | Calling line identification restriction |
| AT+COLP | Connected line identification presentation |
| AT+CCUG | Closed user group |
| AT+CCFC | Call forwarding number and conditions |
| AT+CCWA | Call waiting |
| AT+CHLD | Call related supplementary services |
| AT+CTFR | Call deflection |
| AT+CUSD | Unstructured supplementary service data |
| AT+CSSN | Supplementary service notifications |
| AT+CLCC | List current calls |
| AT+CPOL | Preferred operator list |
| AT+CPLS | Selection of preferred PLMN list |
| AT+COPN | Read operator name |
| AT+CAEMLPP | eMLPP priority Registration and Interrogation |
| AT+WS46 | Select wireless network |

5.1 AT+CNUM Subscriber Number

Returns the MSISDNs related to the subscriber (this information can be stored in the SIM/UICC or in the MT).

| | |
|-------------------|--|
| Test Command | Response |
| AT+CNUM=? | OK |
| Execution Command | Response |
| AT+CNUM | +CNUM: [<alpha1>,<number1>,<type1>[,<speed>,<service>] [<CR><LF> +CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>] [...]] OK If error is related to ME functionality: +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------------|--|
| <alphax> | Optional alphanumeric string associated with <numberx>; used character set should be the one selected with Command Select TE Character Set +CSCS |
| <numberx> | String type(string should be included in quotation marks) phone number of format specified by <typex> |
| <typex> | Type of address octet in integer format (refer GSM04.08[8]subclause 10.5.4.7) |

| | | |
|-----------|--|-----------------------------|
| <speed> | 0 | auto baud |
| | 4 | 2400bps (V.22bis) |
| | 5 | 2400bps (V.26ter) |
| | 6 | 4800bps (V.32) |
| | 7 | 9600bps (V.32) |
| | 12 | 9600bps (V.34) |
| | 14 | 14400bps (V.34) |
| | 68 | 2400bps (V.110 or X.31) |
| | 70 | 4800bps (V.110 or X.31) |
| | 71 | 9600bps (V.110 or X.31) |
| | 75 | 14400bps (V.110 or X.31) |
| | 134 | 64000bps (V.110 or X.31) |
| | | |
| <service> | (service related to the phone number:) | |
| | 0 | Asynchronous modem |
| | 1 | Synchronous modem |
| | 2 | PAD Access (asynchronous) |
| | 3 | Packet Access (synchronous) |
| | 4 | Voice |
| | 5 | Fax |

5.2 AT+CREG Network Registration

Set command controls the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the MT network registration status, or code +CREG:

<stat>[,<lac>,<ci>[,<Act>]] when <n>=2 and there is a change of the network cell.

Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>,<ci> and <Act> are returned only when <n>=2 and MT is registered in the network.

| Test Command | Response |
|------------------|--|
| AT+CREG=? | +CREG: (list of supports <n>) OK |

| | |
|---|--|
| Read Command AT+CREG? | Response +CREG: <n>,<stat>[,<lac>,<ci>[,<Act>]] OK +CME ERROR: <err> |
| Write Command AT+CREG=<n> | Response OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <n> | 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CREG: <stat> 2 enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>[,<Act>]]. |
| <stat> | 0 not registered, MT is not currently searching a new operator to register to 1 registered, home network 2 not registered, but MT is currently searching a new operator to register to 3 registration denied 4 unknown 5 registered, roaming |
| <lac> | string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) |
| <ci> | string type; four byte cell ID in hexadecimal format |
| <Act> | 0 GSM 2 UTRAN 3 GSM w/EGPRS 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA |

5.3 AT+COPS Operator Selection

Set command forces an attempt to select and register the GSM/UMTS network operator. If the selected operator is not available, ERROR is returned.

Read command returns the current mode, the currently selected operator.

Test command returns operator list present in the network.

| | |
|---|--|
| Test Command | Response |
| AT+COPS=? | <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>+COPS: (list of supported<stat>,long alphanumeric<oper>,short alphanumeric<oper>,numeric <oper>)s[,,(list of supported <mode>s), (list of supported <format>s)]</p> <p>OK</p> <p>If error is related to ME functionality: +CME ERROR: <err></p> |
| Write Command | Response |
| AT+COPS=[<mode>][,<format>,<oper>[,<Act>]] | <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p> |
| Read Command | Response |
| AT+COPS? | <p>+COPS: <mode>[,<format>,<oper>]</p> <p>OK</p> <p>or</p> <p>+CME ERROR: <err></p> |

| | |
|-----------|--|
| Reference | <p>Note</p> <p>We DO NOT support full set of alphanumeric format of <oper>, since the code size will become very large. If the customer needs the alphanumeric format, the table can be customized in</p> <p>mcu\custom\common\customer_operator_names.c.</p> <p>+COPS? response is not alphanumeric format when setting with alphanumeric format</p> <p>example:</p> <p>+COPS: 0,0," KG Telecom Co."</p> <p>If you got +COPS: 0,0,"46688"</p> <p>This is possibly due to there is no alphanumeric format name mapping to the operator id</p> <p>-----</p> <p>You can define operator name table in the following file under custom folder.</p> <p>mcu\custom\common\customer_operator_name.c</p> <p>Please check if there is operator name mapping in the name table.</p> <p>If not , Please add your operator name and operator id</p> <p>There is comment information in the file to guide you .</p> <p>Please read the guide before modification.</p> <p>After modification .then 'remake custom'</p> <p>There are two places shall be modified</p> <ol style="list-style-type: none"> 1. RMMI_PLMN_NAME_ENTRIES 2. rmmi_plmn_table <p><mode>=2 supported in projects with __NW_DETACH_SUPPORT__ option. (available after W1012)</p> |
|-----------|--|

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <mode> | <p>0 automatic (<oper> field is ignored)</p> <p>1 manual (<oper> field shall be present)</p> <p>2 deregister from network (disable form 05.48)</p> <p>3 set only <format> (for read command +COPS?), do not attempt registration/deregistration</p> <p>4 reserve</p> |
| <format> | <p>0 long format alphanumeric <oper></p> |

| | |
|--------|------------------------------------|
| | 1 short format alphanumeric <oper> |
| | 2 numeric <oper> |
| <oper> | string type |
| <stat> | 0 unknown |
| | 1 available |
| | 2 current |
| | 3 forbidden |
| <Act> | 0 GSM |
| | 2 UTRAN |

5.4 AT+CLCK Facility Lock

Execute command is used to lock, unlock or interrogate a ME or a network facility <fac>.

| | |
|---|--|
| Test Command | Response |
| AT+CLCK=? | +CLCK: (list of supported <fac>s) OK or +CME ERROR: <err> |
| Write Command | Response |
| AT+CLCK=<fac>,<mode>[,<passwd>,<class>]] | +CME ERROR: <err> when <mode>=2 and command successful: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]] |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <fac> | "PF", "SC", "AO", "OI", "OX", "AI", "IR", "AB", "AG", "AC", "FD", "PN", "PU", "PP", "PC" |
| <mode> | 0 unlock 1 lock 2 query status (only "SC", "AO", "OI", "OX", "AI", "IR" support query mode) |
| <status> | 0 not active |
| <passwd> | 1 active string type |
| <classx> | is a sum of integers each representing a class of information (default 7) 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 8 short message service |

| | |
|-----|-------------------------|
| 16 | data circuit sync |
| 32 | data circuit async |
| 64 | dedicated packet access |
| 128 | dedicated PAD access |

5.5 AT+CPWD Change Password

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK..

| | |
|--|--|
| Test Command | Response |
| AT+CPWD=? | +CPWD: list of supported (<fac>,<pwdlength>)s OK or +CME ERROR: <err> |
| Write Command | Response |
| AT+CPWD=<fac>,<oldpwd>,<newpwd> | OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|--------------------------|--|
| <fac> | "P2" SIM PIN2 refer Facility Lock +CLCK for other values |
| <oldpwd> | string type |
| <newpwd> | string type |
| <pwdlength> | integer type maximum length of the password for the facility |

5.6 AT+CLIP Calling line identification presentation

Requests calling line identification. Determines if the +CLIP unsolicited result code is activated. When the presentation of the CLI at the TE is enabled (and calling subscriber allows), +CLIP: <number>,<type>[,<subaddr>,<satype>] response is returned after every RING.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+CLIP=? | +CLIP: (list of supported <n>s) OK |
| Write Command | Response |
| AT+CLIP=[<n>] | OK Or +CME ERROR: <err> |
| Read Command | Response |
| AT+CLIP? | +CLIP: <n>, <m> OK |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <n> | 0 disable 1 enable |
| <m> | 0 CLIP not provisioned 1 CLIP provisioned 2 unknown (e.g. no network, etc.) |
| <number> | string type phone number of format specified by <type> |
| <type> | type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7) |
| <subaddr> | string type sub address of format specified by <satype> |
| <satype> | type of sub address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.8) |

5.7 AT+CLIR Calling line identification restriction

Requests calling line identification restriction.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+CLIR=? | +CLIR: (list of supported <n>s) OK |
| Write Command | Response |
| AT+CLIR=[<n>] | OK Or +CME ERROR: <err> |
| Read Command | Response |
| AT+CLIR? | +CLIR: <n>,<m> OK |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | 0 presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression |
| <m> | 0 CLIR not provisioned 1 CLIR provisioned in permanent mode 2 unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed |

5.8 AT+COLP Connected line identification presentation

This command refers to the GSM/UMTS supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.

When enabled (and called subscriber allows), +COLP:

<number>,<type>[,<subaddr>,<satype> [,<alpha>]] intermediate result code is returned from TA to TE before any +CR or V.250 [14] responses.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+COLP=? | +COLP: (list of supported <n>s) OK |
| Write Command | Response |
| AT+COLP=[<n>] | OK +CME ERROR: <err> |
| Read Command | Response |
| AT+COLP? | +COLP: <n>,<m> OK |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | 0 disable 1 enable |
| <m> | 0 COLP not provisioned 1 COLP provisioned 2 unknown (e.g. no network, etc.) |

5.9 AT+CCUG Closed user group

This command allows control of the Closed User Group supplementary service.

Set command enables the served subscriber to select a CUG index, to suppress the Outgoing Access (OA), and to suppress the preferential CUG.

| | |
|---|---|
| Test Command | Response |
| AT+CCUG=? | OK |
| Write Command | Response |
| AT+CCUG=[<n>[,<index>[,<info>]]] | OK +CME ERROR: <err> |
| Read Command AT+CCUG? | Response +CCUG: <n>,<index>,<info> OK |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <n> | 0 disable CUG temporary mode 1 enable CUG temporary mode |
| <index> | 0...9 CUG index 10 no index (preferred CUG taken from subscriber data) |
| <info> | 0 no information 1 suppress OA 2 suppress preferential CUG 3 suppress OA and preferential CUG |

5.10 AT+CCFC Call forwarding number and conditions

Sets the call forwarding number and conditions. Registration, erasure, activation, deactivation and status query operations are supported.

| | |
|---|--|
| Test Command | Response |
| AT+CCFC=? | +CCFC: (list of supported <reason>s) OK |
| Write Command | Response |
| AT+CCFC=<reason>,<mode> [,<number> [,<type> [,<class> [,<subaddr> [,<satype> [,<time>]]]]] | +CME ERROR: <err> when <mode>=2 and command successful: +CCFC: <status>,<class1>[,<number>,<type> [,<subaddr>,<satype>[,<time>]]][<CR><LF>+CCFC: <status>,<class2>[,<number>,<type> [,<subaddr>,<satype>[,<time>]]] [...] |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <reason> | 0 unconditional 1 mobile busy 2 no reply 3 not reachable 4 all call forwarding (refer 3GPP TS 22.030 [19]) 5 all conditional call forwarding (refer 3GPP TS 22.030 [19]) |
| <mode> | 0 disable 1 enable 2 query status 3 registration 4 erasure |
| <number> | string type phone number of forwarding address in format specified by <type> |
| <type> | type of address |
| <subaddr> | string type sub address of format specified by <satype> |

| | |
|-----------------------|---|
| <satype> | type of sub address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.8); default 128 |
| <classx> | 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 8 short message service 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access |
| <time> | 1...30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded |
| <status> | 0 not active 1 active |

5.11 AT+CCWA Call waiting

This command allows control of the Call Waiting supplementary service. Activation, deactivation and status query are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>,<type>,<class> to the TE when call waiting service is enabled.

| | |
|--|---|
| Test Command AT+CCWA=? | Response +CCWA: (list of supported <n>) OK ERROR |
| Write Command AT+CCWA=[<n>[,<mode>[,<class>]]] | Response when <mode>=2 and command successful +CCWA: <status>,<class1> [<CR><LF>+CCWA: <status>,<class2> [...]] OK or +CME ERROR: <err> |
| Read Command AT+CCWA? | Response +CCWA: <n> OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|-------------------|
| <n> | 0 disable |
| | 1 enable |
| <mode> | 0 disable |
| | 1 enable |
| | 2 query status |

| | | |
|-----------------------|--|--------------------------------------|
| <classx> | 1 | voice (telephony) |
| | 2 | data (refers to all bearer services) |
| | 4 | fax (facsimile services) |
| | 8 | short message service |
| | 16 | data circuit sync |
| | 32 | data circuit async |
| | 64 | dedicated packet access |
| | 128 | dedicated PAD access |
| <status> | 0 | not active |
| | 1 | active |
| <number> | string type phone number of calling address in format specified by <type> | |
| <type> | type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7) | |

5.12 AT+CHLD Call related supplementary services

Requests call-related supplementary services. Refers to a service that allows a call to be temporarily disconnected from the ME but the connection to be retained by the network, and to a service that allows multiparty conversation. Calls can be put on hold, recovered, released and added to a conversation.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+CHLD=? | [+CHLD: (list of supported <n>s)] OK |
| Write Command | Response |
| AT+CHLD=[<n>] | OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | <ul style="list-style-type: none"> 0 Releases all held calls, or sets User-Determined User Busy for a waiting call 1 Releases all active calls and accepts the other (waiting or held) call 1x Releases the specific active call X 2 Places all active calls on hold and accepts the other (held or waiting) call 2x Places all active calls, except call X, on hold 3 Adds a held call to the conversation 4 Connects two calls and disconnects the subscriber from both calls 5 Activate the Completion of Calls to Busy Subscriber Request. (CCBS) |

5.13 AT+CTFR Call deflection

This refers to a service that causes an incoming alerting call to be forwarded to a specified number.

| | |
|---|---|
| Test Command | Response |
| AT+CTFR=? | OK |
| Write Command | Response |
| AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]] | OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <number> | string type phone number of format specified by <type> |
| <type> | type of address |
| <subaddr> | string type sub address of format specified by <satype> |
| <satype> | type of sub address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.8); default 128 |

5.14 AT+CUSD Unstructured supplementary service data

Allows control of the Unstructured Supplementary Service Data (USSD). Both network- and mobile-initiated operations are supported. This command is used to enable the unsolicited result code +CUSD.

| | |
|--|---|
| Test Command | Response |
| AT+CUSD=? | +CUSD: (list of supported <n>s) OK |
| Write Command | Response |
| AT+CUSD=[<n>[,<str>[,<dcs>]]] | OK +CME ERROR: <err> |
| Read Command | Response |
| AT+CUSD? | +CUSD: <n> OK |

Parameters are defined below:

| Parameters | Description |
|--------------------|--|
| <n> | 0 disable the result code presentation to the TE 1 enable the result code presentation to the TE 2 cancel session (not applicable to read command response) |
| <str> | string type USSD string |
| <dcs> | 3GPP TS 23.038 [25] Cell Broadcast Data Coding Scheme in integer format (default 15) |

5.15 AT+CSSN Supplementary service notifications

This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes presented in the present document or in V.250 [14]. When several different <code1>s are received from the network, each of them shall have its own +CSSI result

code.

When $\langle m \rangle = 1$ and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU:

$\langle \text{code2} \rangle$, $\langle \text{index} \rangle$, $\langle \text{number} \rangle$, $\langle \text{type} \rangle$, $\langle \text{subaddr} \rangle$, $\langle \text{satype} \rangle$]] is sent to TE. In

case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP") and when several different $\langle \text{code2} \rangle$ s are received from the network, each of them shall have its own +CSSU result code.

| | |
|---|--|
| Test Command | Response |
| AT+CSSN=? | +CSSN: (list of supported $\langle n \rangle$s),(list of supported $\langle m \rangle$s) OK |
| Write Command | Response |
| AT+CSSN=[$\langle n \rangle$,$\langle m \rangle$]] | OK +CME ERROR: $\langle \text{err} \rangle$ |
| Read Command | Response |
| AT+CSSN? | +CSSN: $\langle n \rangle$,$\langle m \rangle$ OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|-----------------------------|
| $\langle n \rangle$ | 0 disable 1 enable |
| $\langle m \rangle$ | 0 disable 1 enable |

5.16 AT+CLCC List current calls

Returns list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.

| | |
|------------------|-----------|
| Test Command | Response |
| AT+CLCC=? | OK |

| Execution Command | Response |
|-------------------|---|
| AT+CLCC | [+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>] [...]]] OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <idx> | integer type; call identification number as described in 3GPP TS 22.030 [19] sub clause 4.5.5.1; this number can be used in +CHLD command operations. |
| <dir> | 0 mobile originated (MO) call 1 mobile terminated (MT) call |
| <stat> | 0 active 1 held 2 dialing (MO call) 3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call) |
| <mode> | 0 voice 1 data 2 fax 3 voice followed by data, voice mode 4 alternating voice/data, voice mode 5 alternating voice/fax, voice mode 6 voice followed by data, data mode 7 alternating voice/data, data mode 8 alternating voice/fax, fax mode 9 unknown |
| <mpty> | 0 call is not one of multiparty (conference) call parties 1 call is one of multiparty (conference) call parties |
| <number> | string type phone number in format specified by <type> |
| <type> | type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7) |

5.17 AT+CPOL Preferred operator list

This command is used to edit the SIM preferred list of networks. Execute command writes an entry in the SIM list of preferred operators (EFPLMNsel). If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed.

| | |
|--|---|
| Test Command | Response |
| AT+CPOL=? | +CPOL: (list of supported <index>s), (list of supported <format>s) OK OR +CME ERROR: <err> |
| Read Command | Response |
| AT+CPOL? | +CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>, <GSM_Compact_AcT1>,<UTRAN_AcT1>] [<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>, <GSM_Compact_AcT2>,<UTRAN_AcT2>] [...]] OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CPOL=[<index>][,<format>][,<oper>[<GSM_AcT>,<GSM_compact_AcT>,<UTRAN_AcT>]]] | OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <indexn> | the order number of operator in the SIM/USIM preferred operator list |
| <format> | 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> |

| | |
|---------------------------------|--|
| <opern> | string type; <format> indicates if the format is alphanumeric or numeric (see +COPS) |
| <GSM_AcTn> | 0 access technology not selected 1 access technology selected |
| <GSM_Compact_AcTn> | 0 access technology not selected 1 access technology selected |
| UTRAN_AcTn | 0 access technology not selected 1 access technology selected |

5.18 AT+CPLS Selection of preferred PLMN list

This command is used to select one PLMN selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by +CPOL command. Execute command selects a list in the SIM/USIM. Read command returns the selected PLMN selector list from the SIM/USIM. Test command returns the whole index range supported lists by the SIM/USIM

| | |
|-----------------------------|--|
| Test Command | Response |
| AT+CPLS=? | +CPLS: <list of supported<lis>s> OK +CME ERROR: <err> |
| Read Command | Response |
| AT+CPLS? | +CPLS: <list> OK |
| Write Command | Response |
| AT+CPLS=<list> | OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | | |
|---------------------|----------|--|
| <list> | 0 | User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC) |
| | 1 | Operator controlled PLMN selector with Access Technology EFOPLMNwAcT |
| | 2 | HPLMN selector with Access Technology EFHPLMNwAcT |

5.19 AT+COPN Read operator name

Execute command returns the list of operator names from the MT. Each operator code <numeric> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.

| | |
|-------------------|---|
| Test Command | Response |
| AT+COPN=? | OK |
| Execution Command | Response |
| AT+COPN | +COPN: <numeric1>,<alpha1>[<CR><LF>+COPN: <numeric2>,<alpha2>[...]] OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <numeric> | string type; operator in numeric format (see +COPS) |
| <alphan> | string type; operator in long alphanumeric format (see +COPS) |

5.20 AT+CAEMLPP eMLPP priority Registration and Interrogation

The execute command is used to change the default priority level of the user in the network. The requested priority level is checked against the eMLPP subscription of the user stored on the SIM card or in the active application in the UICC (GSM or USIM) EFeMLPP. If the user doesn't have subscription for the requested priority level an ERROR or +CME ERROR result code is returned.

The read command triggers an interrogation of the provision of the maximum priority level which the service subscriber is allowed to use and default priority level activated by the user.

If the service is not provisioned, a result code including the SS-Status (?) parameter is returned.

| | |
|------------------------------------|--|
| Test Command | Response |
| AT+CAEMLPP=? | OK |
| Read Command | Response |
| AT+CAEMLPP? | +CAEMLPP:<default_priority>,<max_priority> OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CAEMLPP=<priority> | +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|---------------------------------|---|
| <priority> | integer type parameter which identifies the default priority level to be activated in the network, values specified in 3GPP TS 22.067 [54] |
| <default_priority> | integer type parameter which identifies the default priority level which is activated in the network, values specified in 3GPP TS 22.067 [54] |
| <max_priority> | integer type parameter which identifies the maximum priority level for which the service subscriber has a subscription in the network, values specified in 3GPP TS 22.067 [54]. |

5.21 AT+WS46 Select wireless network

Select the cellular network (Wireless Data Service; WDS) to operate with the TA. This command may be used when TA is asked to indicate the networks in which it can operate.

| | |
|------------------|--|
| Test Command | Response |
| AT+WS46=? | +WS46 : (list of supported <n>s) OK |
| Read Command | Response |
| AT+WS46? | +WS46: <n> OK |

| Write Command | Response |
|----------------------------|---|
| AT+WS46=[<n>] | OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | 25 3GPP Systems (both GERAN and UTRAN) |

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6 MT control and status commands

Overview of MT control AT Commands:

| AT Command | Description |
|----------------|------------------------------------|
| AT+CPAS | Phone activity status |
| AT+CFUN | Set Phone Functionality |
| AT+CPIN | Enter PIN |
| AT+CBC | Battery Charge |
| AT+CSQ | Signal Quality |
| AT+CMEC | Mobile Termination control mode |
| AT+CIND | Indicator control |
| AT+CMER | Mobile Termination event reporting |
| AT+CPBS | Select Phonebook Memory Storage |
| AT+CPBR | Read phonebook entries |
| AT+CPBF | Find Phonebook entries |
| AT+CPBW | Write Phonebook entries |
| AT+CCLK | Clock |
| AT+CALA | Alarm |
| AT+CRSM | Restricted SIM access |
| AT+CRSL | Ringer Sound Level |
| AT+CLVL | Loudspeaker volume level |
| AT+CMUT | Mute Control |
| AT+CLAE | Language Event |
| AT+CALD | Delete alarm |
| AT+CTZR | Time Zone Reporting |

6.1 AT+CPAS Phone activity status

Returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone. If the command is executed without the <mode> parameter, only <pas> values from 0 to 128 are returned. If the <mode> parameter is included in the execution command, <pas> values from 129 to 255 may also be returned.

| Test Command | Response |
|-------------------|---|
| AT+CPAS=? | +CPAS: (list of supported <pas>s) OK +CME ERROR: <err> |
| Execution Command | Response |
| AT+CPAS | +CPAS: <pas> OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|--------------------|--|
| <pas> | 0 ready (MT allows commands from TA/TE) 1 unknown 2 unknown (MT is not guaranteed to respond to instructions) 3 ringing (MT is ready for commands from TA/TE, but the ringer is active) 4 call in progress (MT is ready for commands from TA/TE, but a call is in progress) 5 unknown |

6.2 AT+CFUN Set Phone Functionality

AT+CFUN = 0 turn off radio and SIM power. (supported only for feature phone with feature option)

AT+CFUN = 1, 1 or AT+CFUN=4,1 can reset the target. (supported only for feature phone)

AT+CFUN = 1 can enter normal mode. (supported only for module solution)

AT+CFUN = 4 can enter flight mode. (supported only for module solution)

| | |
|--|---|
| Test Command | Response |
| AT+CFUN=? | +CFUN: (list of supported <fun>s), (list of supported <rst>s) OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CFUN=[<fun>[,<rst>]] | OK or +CME ERROR: <err> |
| Reference | Note The supported parameters are subject to change according to different compile directives (options). AT+CFUN=1,1 or AT+CFUN=4,1 can only reset the target, not fully compliant with 27.007 <fun> = 0,1,4 only supported in projects with __ATCFUN_FLIGHTMODE_SUPPORT__ option. |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <fun> | 0 turn off radio and SIM power <u>1</u> full functionality 4 disable phone both transmit and receive RF circuits (supported only for module solution) |
| <rst> | 0 do not reset the MT before setting it to <fun> power level 1 reset the MT before setting it to <fun> power level |

6.3 AT+CPIN Enter PIN

Set command sends to the ME a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards ME and an error message, +CME ERROR, is returned to TE. Refer [1] 9.2 for possible <err> values.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin,

<newpin>, is used to replace the old pin in the SIM.

| | |
|---|---|
| Test Command | Response |
| AT+CPIN=? | OK ERROR |
| Read Command | Response |
| AT+CPIN? | +CPIN: <code> OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CPIN=<pin>[,<newpin>] | OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--------------------|
| <pin> | string type values |
| <newpin> | string type values |

| | |
|---------------------|--|
| <code> | <p><code> values reserved by the present document:</p> <p>READY MT is not pending for any password</p> <p>SIM PIN MT is waiting SIM PIN to be given</p> <p>SIM PUK MT is waiting SIM PUK to be given</p> <p>PH-SIM PIN MT is waiting phone to SIM card password to be given</p> <p>PH-FSIM PIN MT is waiting phone-to-very first SIM card password to be given</p> <p>PH-FSIM PUK MT is waiting phone-to-very first SIM card unblocking password to be given</p> <p>SIM PIN2 MT is waiting SIM PIN2 to be given</p> <p>SIM PUK2 MT is waiting SIM PUK2 to be given</p> <p>PH-NET PIN MT is waiting network personalization password to be given</p> <p>PH-NET PUK MT is waiting network personalization unblocking password to be given</p> <p>PH-NETSUB PIN MT is waiting network subset personalization password to be given</p> <p>PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given</p> <p>PH-SP PIN MT is waiting service provider personalization password to be given</p> <p>PH-SP PUK MT is waiting service provider personalization unblocking password to be given</p> <p>PH-CORP PIN MT is waiting corporate personalization password to be given</p> <p>PH-CORP PUK MT is waiting corporate personalization unblocking password to be given</p> |
|---------------------|--|

6.4 AT+CBC Battery Charge

Execution and read command returns battery connection status <bcs> and battery level <bcl> of the ME.

| Test Command | Response |
|-----------------|---|
| AT+CBC=? | <p>+CBC: (list of supported <bcs>s), (list of supported <bcl>s)</p> <p>OK</p> |

| | |
|-------------------|--|
| Execution Command | Response |
| AT+CBC | +CBC: <bc>,<bcl> OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <bc> | 0 MT is powered by the battery 1 MT has a battery connected, but is not powered by it 2 MT does not have a battery connected 3 Recognized power fault, calls inhibited |
| <bcl> | 0 battery is exhausted, or MT does not have a battery connected 1...100 battery has 1 100 percent of capacity remaining |

6.5 AT+CSQ Signal Quality

The command returns received signal strength indication <rsi> and channel bit error rate <ber> from the ME.

| | |
|-------------------|--|
| Test Command | Response |
| AT+CSQ=? | +CSQ: (0-31,99),(0-7,99) OK ERROR |
| Execution Command | Response |
| AT+CSQ | +CSQ: <rsi>, <ber> OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <rsi> | 0 113 dBm or less 1 111 dBm 2...30 109... 53 dBm 31 51 dBm or greater 99 not known or not detectable |
| <ber> | 0...7 as RXQUAL values in the table in TS 45.008 [20] sub clause 8.2.4 not known or not detectable 99 not known or not detectable |

6.6 AT+CMEC Mobile Termination control mode

Set command selects the equipment, which operates MT keypad, writes to MT display and sets MT indicators. If operation mode is not allowed by the MT, +CME ERROR: <err> is returned.

Test command returns the modes supported as compound values.

| | |
|--|---|
| Test Command | Response |
| AT+CMEC=? | +CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s) OK |
| Read Command | Response |
| AT+CMEC? | +CMEC: <keyp>,<disp>,<ind> OK |
| Write Command | Response |
| AT+CMEC=[<keyp>[,<disp>[,<ind>]]] | OK +CME ERROR: <err> |
| Reference | Note Change History: The command is available from 09B.1009MP |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <keyp> | 0 MT can be operated only through its keypad (execute command of +CKPD cannot be used) 1 MT can be operated only from TE (with command +CKPD) 2 MT can be operated from both MT keypad and TE |
| <disp> | 0 only MT can write to its display (command +CDIS can only be used to read the display) 1 only TE can write to MT display (with command +CDIS) 2 MT display can be written by both MT and TE |
| <ind> | 0 only MT can set the status of its indicators (command +CIND can only be used to read the indicators) 1 only TE can set the status of MT indicators (with command +CIND) 2 MT indicators can be set by both MT and TE |

6.7 AT+CIND Indicator control

Displays the value of ME indicators.

| | |
|--|--|
| Test Command | Response |
| AT+CIND=? | +CIND: (<descr>,(list of supported <ind>s)) [,<descr>,(list of supported <ind>s))[,...]] OK +CME ERROR: <err> |
| Read Command | Response |
| AT+CIND? | +CIND: <ind>[,<ind>[,...]] OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CIND=[<ind>[,<ind>[,...]]] | +CME ERROR: <err> |
| Reference | Note |
| | "call setup" is proprietary defined in MTK solution and only used when BT supported. |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <ind> | integer type value, which shall be in range of corresponding <descr> <descr> values reserved by the present document and their <ind> ranges: "battchg" battery charge level (0-5) "signal" signal quality (0-5) "service" service availability (0,1) "message" message received (0,1) "call" call in progress (0,1) "roam" roaming indicator (0,1) "call setup" call setup indicator(0-3) "smsfull" a short message memory storage in the MT has become full(1) or memory locations are available (0) |

6.8 URC: +CIEV NITZ indicator event

This URC is the result code of an NITZ indicator event.

| | |
|--|--|
| | Response Unsolicited result code +CIEV: <ind>,<value1>[,<value2>,...] |
|--|--|

Parameters are defined below:

| Parameters | Description |
|--------------------|--|
| <ind> | 9: NITZ date/time/time zone information +CIEV: 9,<UT>,<TZ>[,<DST>] <UT> , Universal Time , String type "YY/MM/DD,HH:MM:SS" <TZ>: Local Time Zone, Integer type ex: +4 or -4 <DST>: Daylight Saving Time , Integer type 1: Summer time 0: Winter time ex: +CIEV: 9,"09/05/16,16:56:00",-28,1 |

6.9 AT+CMER Mobile Termination event reporting

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes.

Test command returns the modes supported as compound values.

| | |
|------------------|---|
| Test Command | Response |
| AT+CMER=? | +CMER: (list of supported <mode>s),(list of supported <key>s),(list of supported<disp>s), (list of supported <ind>s),(list of supported <bfr>s) OK |
| Read Command | Response |
| AT+CMER? | +CMER: <mode>,<keyp>,<disp>,<ind>,<bfr> OK |

| | |
|--|--|
| Write Command | Response |
| AT+CMER=[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]][,<tscrn>]]]]] | OK +CME ERROR: <err> |
| Reference | Note We don't support set command of +CIND to set the values of MT indicators. So behaviors of <ind> 1 and 2 are currently the same. The +CKEV URC which set by <keyp> parameter only reports when UART setting is SIM1. <tscrn> parameter take effect after W1021. |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | <p>0 buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded</p> <p>1 discard unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE</p> <p>2 buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation; otherwise forward them directly to the TE</p> <p>3 forward unsolicited result codes directly to the TE; TA-TE link specific in band technique used to embed result codes and data when TA is in on-line data mode</p> |
| <keyp> | <p>0 no keypad event reporting</p> <p>1 keypad event reporting using result code +CKEV: <key>, <press>, <key> indicates the key (refer IRA values defined in table in sub clause "Keypad control +CKPD") and <press> if the key is pressed or released (1 for pressing and 0 for releasing). Only those key pressing, which are not caused by +CKPD shall be indicated by the TA to the TE.</p> <p>NOTE 1: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.</p> <p>NOTE 2: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.</p> |
| <disp> | <p>0 no display event reporting</p> |

| | |
|----------------------|--|
| <ind> | <p>0 no indicator event reporting</p> <p>1 indicator event reporting using result code +CIEV: <ind>,<value>. <ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to TE</p> <p>2 indicator event reporting using result code +CIEV: <ind>,<value>. All indicator events shall be directed from TA to TE</p> |
| <bfr> | <p>0 TA buffer of unsolicited result codes defined within this command is cleared when when <mode> 1...3 is entered</p> <p>1 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)</p> |
| <tscrn> | <p>0 no touch screen event reporting</p> <p>1 touch screen event reporting using result code +CTEV: <action>,<x>,<y>. The <x>,<y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), and <action> indicates the action performed on the screen (0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 3: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of <bfr> setting.</p> <p>2 touch screen event reporting using result code +CTEV: <action>,<x>,<y>. All touch screen events shall be directed from the TA to the TE. NOTE 4: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of <bfr> setting.</p> <p>3 Verbose mode. Touch screen event reporting using +CTEV: <action>,<x>,<y>. This is a special mode where intermediate depressed result codes (+CTEV:<x>,<y>,depressed) are generated for each new <x>,<y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 5: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of <bfr> setting.</p> |

6.10 AT+CPBS Select Phonebook Memory Storage

Selects the phonebook memory storage <storage> that is used by other phonebook commands.

| | |
|--------------------------------|---|
| Test Command | Response |
| AT+CPBS=? | +CPBS: (list of supported <storage>s) OK |
| Read Command | Response |
| AT+CPBS? | +CPBS: <storage>[,<used>,<total>] OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CPBS=<storage> | OK +CME ERROR: <err> |
| Reference | Note |
| | 1. We don't support query <used> field for the storage "LD", "MC", "RC", "DC", "FD" in the module(modem) project. It would be always 0. |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <storage> | "ME" MT phonebook "SM" SIM/UICC phonebook "LD" last-dialing phonebook "MC" MT missed calls list "RC" MT received calls list. "DC" MT dialed calls list "FD" SIM/USIM fix dialing-phonebook "ON" SIM own numbers (MSISDNs) list |

6.11 AT+CPBR Read phonebook entries

Returns phone book entries in location number range <index1>...<index2> from the current

phonebook memory storage selected by AT+CPBS. If <index2> is omitted, only location <index1> is returned. Entry fields returned are location number <indexn>, phone number <number> in <indexn>, and text <text> associated with the number.

| | |
|--|---|
| Test Command | Response |
| AT+CPBR=? | +CPBR: (list of supported <index>s),[<nlength>],[<tlength>] OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CPBR=<index1>[,<index2>] | [+CPBR: <index1>,<number>,<type>,<text>[,<hidden>]][...] <CR><LF>+CPBR: <index2>,<number>,<type>,<text>[,<hidden>]] OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------------|--|
| <index> | integer type values in the range of location numbers of phonebook memory |
| <index1> | integer type values in the range of location numbers of phonebook memory |
| <index2> | integer type values in the range of location numbers of phonebook memory |
| <number> | string type phone number of format <type> |
| <type> | type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7) |
| <text> | string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS |
| <nlength> | integer type value indicating the maximum length of field <number> |
| <tlength> | integer type value indicating the maximum length of field <text> |
| <hidden> | 0: phonebook entry not hidden 1: phonebook entry hidden |

6.12 AT+CPBF Find Phonebook entries

Execution command returns phonebook entries (from the current phonebook memory storage

selected with +CPBS) which alphanumeric field start with string <find text>(Prefix match).

Entry fields returned are location number <indexn>, phone number stored there <number> (of format <type>) and text <text> associated with the number.

| Test Command | Response |
|----------------------------------|---|
| AT+CPBF=? | +CPBF: [<nlength>],[<tlength>] OK or +CME ERROR: <err> |
| Write Command | Response |
| AT+CPBF=<find text> | [+CPBF: <index1>,<number>,<type>,<text> [[...] <CR><LF>+CBPF: <index2>,<number>,<type>,<text>]] OK +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|---------------------------------------|---|
| <index1>,<index2> | Integer type values in the range of location numbers of phonebook memory |
| <number> | String type phone number of format <type> |
| <type> | Type of address octet in integer format (refer TS 24.008 [8] sub clause 10.5.4.7) |
| <find text>,<text> | String type field of maximum length <tlength>. Only support "IRA" |
| <nlength> | Integer type value indicating the maximum length of field <number> |
| <tlength> | Integer type value indicating the maximum length of field <text> |

6.13 AT+CPBW Write Phonebook entries

Writes phonebook entry in location number <index> in the current phonebook memory storage area, selected with AT+CPBS. If the <number> and <text> parameters are omitted, the entry is deleted. If <index> is omitted but <number> is included, the entry is written to the first free location in the phonebook.

| | |
|--|---|
| Test Command | Response |
| AT+CPBW=? | +CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s),[<tlength>] OK +CME ERROR: <err> |
| Write Command | Response |
| AT+CPBW=[<index>][,<number>,<type>[,<text>][,<hidden>]] | OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <index> | integer type values in the range of location numbers of phonebook memory |
| <number> | string type phone number of format <type> |
| <type> | type of address |
| <text> | string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS. "UCS2"" and "IRA"" are supported. |
| <nlength> | integer type value indicating the maximum length of field <number> |
| <tlength> | integer type value indicating the maximum bytes of field <text> after encoding |

6.14 AT+CCLK Clock

Set command sets the real-time clock of the MT.

Read command returns the current setting of the clock.

| | |
|------------------|-----------|
| Test Command | Response |
| AT+CCLK=? | OK |

| | |
|-----------------------------|---|
| Read Command | Response |
| AT+CCLK? | +CCLK: <time> OK |
| | or |
| | +CME ERROR: <err> |
| Write Command | Response |
| AT+CCLK=<time> | OK |
| | or |
| | +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <time> | string type value; format is "yy/MM/dd, hh:mm:ss", where characters indicate year (two last digits), month, day, hour, minutes, seconds. |

6.15 AT+CALA Alarm

Sets an alarm time in the ME.

| | |
|------------------|---|
| Test Command | Response |
| AT+CALA=? | +CALA: (0) OK |
| Read Command | Response |
| AT+CALA? | [+CALA: <time>] OK |
| | or |
| | +CME ERROR: <err> |

| | |
|-----------------------------|---|
| Write Command | Response |
| AT+CALA=<time> | OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|---------------------|-------------|
| <time> | refer +CCLK |

6.16 AT+CRSM Restricted SIM access

Set command transmits to the MT the SIM <command> and its required parameters.

| | |
|--|--|
| Write Command | Response |
| AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]] | +CRSM: <sw1>,<sw2>[,<response>] OK Or +CME ERROR: <err> |
| Test Command | Response |
| AT+CRSM=? | OK |
| Reference | <p>Note</p> <p><pathid> + <fileid> can be a unique identifier on the SIM/UICC.</p> <p><input type="checkbox"/><input type="checkbox"/> In US IM, the response of STATUS and GET RESPONSE is TLV format, and length is not fixed. So the P3 should be assigned as "00" as 256 bytes, which is the maximum value of response data.</p> |

Example

1. Read EFSST (file_idx= 0x6F38 , structure: transparent)

(1) Get RESPONSE first , 3~4 byte is the file size information.(e.g. 000A=10)

at+crsm=192,28472

+CRSM: 144, 0, "0000000A6F38040015005501010000"

OK

at+crsm=176,28472,0,0,10

+CRSM: 144, 0, "FF3FFFFFF00003C03000C"

OK

2. Read a EFADN (file_idx= 0x6F3A , structure: Linear fixed)

(1)GET RESPONSE first , No.15 byte represents the record length (e.g 1E =30)

at+crsm=192,28474

+CRSM: 144, 0, "00001D4C6F3A04001100220502011E"

OK

(2) READ RECORD

at+crsm=178,28474,1,4,30

+CRSM: 144, 0,

"6F776E6572FFFFFFFFFFFFFFFFFFFFFFFF06819078303326FFFFFFFFFFFFFFF"

OK

3. READ EF Image Instance Data Files (with <pathid>)

(file_idx = 0x4F20(File id would be different if you use other SIM cards), structure: Transparent)

(1) GET RESPONSE first (without AT command example)

(2) READ BINARY

AT+CRSM=176,20256,0,0,1,,"7F105F50"

+CRSM: 144, 0, "00"

OK

Parameters are defined below:

| Parameters | Description |
|------------|--|
| <command> | 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS |

| | |
|-------------------------|--|
| <fileid> | integer type; this is the identifier of a elementary data file on SIM. <P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the SIM.(For detailed information , please refer 3GPP TS11.11 Section 9.2) |
| <data> | information which shall be written to the SIM (hexadecimal character format; refer +CSCS) |
| <pathid> | string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60]. NOTE: Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the <pathid> indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if <pathid> is omitted, it could be implementation specific which one will be selected. <sw1>, <sw2>: integer type; information from the SIM about the execution of the actual command. |
| <response> | response of a successful completion of the command previously issued (hexadecimal character format) [Note1]: READ BINARY command is used for transparent EF. READ RECORD is used for linear fixed or cyclic EF [Note2]: Before using READ BINARY, READ RECORD, UPDATE BINARY, UPDATE RECORD, please use command GET RESPONSE to get the exact length information first. |

6.17 AT+CRSL Ringer Sound Level

Set the incoming call ringer sound level.

| Test Command | Response |
|------------------|---|
| AT+CRSL=? | +CRSL: (list of supported <level>s) OK Or +CME ERROR: <err> |

| | |
|------------------------------|--|
| Read Command | Response |
| AT+CRSL? | +CRSL: <level> OK Or +CME ERROR: <err> |
| Write Command | Response |
| AT+CRSL=<level> | OK or +CME ERROR: <err> |
| Reference | Note This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <level> | integer type value with manufacturer specific range |

6.18 AT+CLVL Loudspeaker volume level

Sets the volume of the internal speaker in the ME

| | |
|------------------|---|
| Test Command | Response |
| AT+CLVL=? | +CLVL: (list of supported <level>s) OK Or +CME ERROR: <err> |

| | |
|------------------------------|--|
| Read Command | Response |
| AT+CLVL? | +CLVL: <level> OK |
| | Or |
| | +CME ERROR: <err> |
| Write Command | Response |
| AT+CLVL=<level> | OK or +CME ERROR: <err> |
| Reference | Note This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <level> | integer type value with manufacturer specific range. |

6.19 AT+CMUT Mute Control

Enable/Disable the uplink voice muting during a voice call.

| | |
|------------------|---|
| Test Command | Response |
| AT+CMUT=? | +CMUT: (list of supported <n>s) OK |
| Read Command | Response |
| AT+CMUT? | +CMUT: <n> OK |
| | Or |
| | +CME ERROR: <err> |

| | |
|--------------------------|--|
| Write Command | Response |
| AT+CMUT=<n> | OK |
| | Or |
| | +CME ERROR: <err> |
| Reference | Note |
| | This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|------------------|-------------------------|
| <n> | 0 mute off 1 mute on |

6.20 AT+CLAE Language Event

to enable/disable unsolicited result code +CLAV: <code>. If <mode>=1, +CLAV: <code> is sent from the ME when the language in the ME is changed.

| | |
|-----------------------------|---|
| Write Command | Response |
| AT+CLAE=<mode> | OK |
| | Or |
| | +CME ERROR: <err> |
| Test Command | Response |
| AT+CLAE=? | +CLAE: (list of supported <mode>s) |
| | OK |
| | Or |
| | +CME ERROR: <err> |
| Read Command | Response |
| AT+CLAE? | +CLAE: <mode> |
| | OK |
| | Or |
| | +CME ERROR: <err> |

| | |
|-----------|--|
| Reference | Note |
| | This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 Disable unsolicited result code +CLAE 1 Enable unsolicited result code +CLAE <code>: For description see +CLAN. |

6.21 AT+CALD Delete alarm

Action command deletes an alarm in the MT.

| | |
|--------------------------|---|
| Test Command | Response |
| AT+CALD=? | +CALD: (list of supported <n>s) OK Or +CME ERROR: <err> |
| Write Command | Response |
| AT+CALD=<n> | OK Or +CME ERROR: <err> |
| Reference | Note |
| | This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | integer type value indicating the index of the alarm; default is manufacturer specific. |

6.22 AT+CTZR Time Zone Reporting

Enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed.

| | |
|------------------------------|---|
| Test Command | Response |
| AT+CTZR=? | +CTZR: (list of supported <onoff>s) OK Or +CME ERROR: <err> |
| Read Command | Response |
| AT+CTZR? | +CTZR: <onoff> OK or +CME ERROR: <err> |
| Write Command | Response |
| AT+CTZR=<onoff> | OK Or +CME ERROR: <err> |
| Reference | Note This command can't be used when UART setting is SIM2 |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <onoff> | integer type value indicating: 0 – Disable automatic time zone update via NITZ (default). 1 – Enable automatic time zone update via NITZ |

6.23 AT+MZONE Read Time Zone

Read current time zone, 15 minutes per unit.

| | |
|-------------------|--|
| Execution Command | Response |
| AT+MZONE | + MZONE: < zone> OK Or +CME ERROR: <err> |
| Read Command | Response |
| AT+ MZONE? | + MZONE: < zone> OK or +CME ERROR: <err> |
| Reference | Note China Mobile SIM card only |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <zone> | integer type value indicating: Current time zone, 15 minutes per unit |

Example:

| Commands | Response |
|-------------------|------------------------------------|
| AT+ CTZR=1 | OK |
| AT+CFUN=0 | OK |
| AT+CFUN=1 | OK |
| AT+MZONE | + MZONE: 32 OK |
| Reference | Note China Mobile SIM card only |

7 GPRS commands(27.007)

Overview of GPRS AT Commands:

| AT Command | Description |
|-------------------|---|
| AT+CGDCONT | Define PDP Context |
| AT+CGQREQ | Quality of Service Profile (Requested) |
| AT+CGATT | PS attach or detach |
| AT+CGACT | PDP context activate or deactivate |
| AT+CGCMOD | PDP Context Modify |
| AT+CGDATA | Enter data state |
| AT+CGPADDR | Show PDP address |
| AT+CGAUTO | Automatic response to network request PDP context activation |
| AT+CGANS | Manual response to a network request for PDP context activation |
| AT+CGCLASS | GPRS mobile station class |
| AT+CGREG | GPRS network registration status |
| AT+CGSMS | Select service for MO SMS messages |
| AT+EGTP | PRS Transfer Preference |

7.1 AT+CGDCONT Define PDP Context

Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

| | |
|---|---|
| Test Command | Response |
| AT+CGDCONT=? | +CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[,...[(list of supported <pdN>s)]]] [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[,...[(list of supported <pdN>s)]]] [...] OK |
| Read Command | Response |
| AT+CGDCONT? | +CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,...[,pdN]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,...[,pdN]]] [...] OK |
| Write Command | Response |
| AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,...[,pdN]]]]]]]]] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------------------------|--|
| <cid> | (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. |
| <PDP_type> | (Packet Data Protocol type) a string parameter. IP Internet Protocol (IETF STD 5) |
| <APN> | (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. |
| <PDP_address> | a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. |
| <d_comp> | a numeric parameter that controls PDP data compression (applicable for SNDTCP only) 0 - off (default if value is omitted) |
| <h_comp> | a numeric parameter that controls PDP header compression 0 - off (default if value is omitted) |
| <pd1>,... <pdN> | zero to N string parameters whose meanings are specific to the <PDP_type> |

7.2 AT+CGQREQ Quality of Service Profile (Requested)

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

| | |
|--|--|
| Test Command | Response |
| AT+CGQREQ=? | +CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s)[...]] OK |
| Read Command | Response |
| AT+CGQREQ? | +CGQREQ: <cid>, <precedence >,<delay>, <reliability>, <peak>, <mean>[<CR><LF>+CGQREQ: <cid>, <precedence>, <delay>, <reliability>., <peak>,<mean>[...]] OK |
| Write Command | Response |
| AT+CGQREQ=[<cid>[,<precedence >[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|----------------------------|---|
| <cid> | a numeric parameter which specifies a particular PDP context definition |
| <precedence> | a numeric parameter which specifies the precedence class |
| <delay> | a numeric parameter which specifies the delay class |
| <reliability> | a numeric parameter which specifies the reliability class |
| <peak> | a numeric parameter which specifies the peak throughput class |
| <mean> | a numeric parameter which specifies the mean throughput class |

7.3 AT+CGATT PS attach or detach

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state.

| | |
|----------------------------------|--|
| Test Command | Response |
| AT+CGATT=? | +CGATT: (list of supported <state>s) OK |
| Read Command | Response |
| AT+CGATT? | +CGATT: <state> OK |
| Write Command | Response |
| AT+CGATT= [<state>] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <state> | indicates the state of PS attachment 0 detached 1 attached |

7.4 AT+CGACT PDP context activate or deactivate

To activate or deactivate the specified PDP context (s).

| | |
|-------------------|--|
| Test Command | Response |
| AT+CGACT=? | +CGACT: (list of supported <state>s) OK |

| | |
|--|---|
| Read Command | Response |
| AT+CGACT? | +CGACT: <cid>, <state>[<CR><LF>+CGACT: <cid>, <state>[...]] OK |
| Write Command | Response |
| AT+CGACT=[<state> [,<cid>]] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <state> | indicates the state of PDP context activation 0 deactivated 1 activated Other values are reserved and will result in an ERROR response to the execution command. |
| <cid> | a numeric parameter which specifies a particular PDP context definition. If no <cid> is specified, then UE assumes it as 1. The usage of omitted <cid> to activate/deactivate all is not supported. |

7.5 AT+CGCMOD PDP Context Modify

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

| | |
|------------------------------|---|
| Test Command | Response |
| AT+CGCMOD=? | +CGCMOD: (list of <cid>s associated with active contexts) OK |
| Write Command | Response |
| AT+CGCMOD=<cid> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <cid> | a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). |

7.6 AT+CGDATA Enter data state

The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types.

| | |
|--|---|
| Test Command | Response |
| AT+CGDATA=? | +CGDATA: (list of supported <L2P>s) OK |
| Write Command | Response |
| AT+CGDATA=[<L2P> , [<cid>]] | CONNECT [<rate>] or ERROR |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <L2P> | a string parameter that indicates the layer 2 protocol to be used between the TE and MT PPP Point-to-point protocol for a PDP such as IP Other values will result in an ERROR response. |
| <cid> | a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT). |
| <rate> | Network rate |

7.7 AT+CGPADDR Show PDP address

The execution command returns a list of PDP addresses for the specified context identifiers.

The test command returns a list of defined <cid>s.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+CGPADDR=? | +CGPADDR: (list of defined <cid>s) OK |
| Write Command | Response |
| AT+CGPADDR=<cid> | +CGPADDR: <cid>,<PDP_addr> OK |

Parameters are defined below:

| Parameters | Description |
|----------------------------|--|
| <cid> | a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). If no <cid> is specified, an ERROR result code will be returned. Multiple <cid> field is not supported. |
| <PDP_address> | a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available. |

7.8 AT+CGAUTO Automatic response to network request PDP context activation

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network.

When the +CGAUTO=0 command is received, the MT shall not perform a PS detach if it is attached. Subsequently, when the MT announces a network request for PDP context activation by issuing the unsolicited result code RING or +CRING, the TE may manually accept or reject the request by issuing the +CGANS command or may simply ignore the network request.

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

<cid> values specified.

| | |
|----------------------------|--|
| Read Command | Response |
| AT+CGAUTO? | +CGAUTO: <n> OK |
| Write Command | Response |
| AT+CGAUTO=<n> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | 0 turn off automatic response for Packet Domain only 1 turn on automatic response for Packet Domain only For <n> = 0 Packet Domain network requests are manually accepted or rejected by the +CGANS command. For <n> = 1 Packet Domain network requests are automatically accepted according to the description above. |

7.9 AT+CGANS Manual response to a network request for PDP context activation

The execution command requests the MT to respond to a network request for Packet Domain PDP context activation which has been signaled to the TE by the RING or +CRING:

unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

| | |
|-------------------|--|
| Test Command | Response |
| AT+CGANS=? | +CGANS: (list of supported<response>s), (list of supported <L2P>s) OK |

| | |
|--|---------------------------------|
| Write Command | Response |
| AT+CGANS=[<response>],[<L2P>],[<cid>]]] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|-------------------------|---|
| <response> | 0 reject the request 1 accept and request that the PDP context be activated |
| <L2P> | a string parameter which indicates the layer 2 protocol to be used (see +CGDATA command). |
| <cid> | a numeric parameter which specifies a particular PDP context definition |

7.10 AT+CGCLASS GPRS mobile station class

The set command is used to set the MT to operate according to the specified GPRS mobile class. If the requested class is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

| | |
|-----------------------------------|---|
| Test Command | Response |
| AT+CGCLASS=? | +CGCLASS: (list of supported<class>s) OK |
| Read Command | Response |
| AT+CGCLASS? | +CGCLASS:<class> OK |
| Write Command | Response |
| AT+CGCLASS=[<class>] | OK or ERROR |

| | |
|-----------|---|
| Reference | Note |
| | On MAUI and 09A branches, after W0918, the test command and the query command can be used while a normal SIM card is inserted. Before this, the +CGCLASS command can be only used while a test SIM is inserted. |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <class> | <p>a string parameter which indicates the GPRS mobile class (in descending order of functionality)</p> <p>A class A (highest)</p> <p>B class B</p> <p>CG class C in GPRS only mode</p> <p>CC class C in circuit switched only mode (lowest)</p> <p>Other values are reserved and will result in an ERROR response to the set command.</p> <p>If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a detach request shall be sent to the network.</p> |

7.11 AT+CGREG GPRS network registration status

The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>[,<Act>]] when <n>=2 and there is a change of the network cell.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>,<ci> and <Act> are returned only when <n>=2 and MT is registered in the network.

| | |
|-------------------|---------------------------------------|
| Test Command | Response |
| AT+CGREG=? | +CGREG: (0-2) OK |

| | |
|--|--|
| Read Command AT+CGREG? | Response +CGREG:<n>,<stat>[,<lac>,<ci>[,<Act>]] OK or +CME ERROR: <err> |
| Write Command AT+CGREG=[<n>] | Response OK |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <n> | 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CGREG: <stat> 2 enable network registration and location information unsolicited result code +CGREG: |
| <stat> | 0 not registered, MT is not currently searching an operator to register to 1 registered, home network 2 not registered, but MT is currently trying to attach or searching an operator to register to 3 registration denied 4 unknown 5 registered, roaming |
| <lac> | string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) |
| <ci> | string type; four byte cell ID in hexadecimal format |
| <Act> | 0 GSM 2 UTRAN 3 GSM w/EGPRS 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA |

7.12 AT+CGSMS Select service for MO SMS messages

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

| | |
|----------------------------------|---|
| Test Command | Response |
| AT+CGSMS=? | +CGSMS: (0-3) OK |
| Write Command | Response |
| AT+CGSMS= <service> | OK or ERROR |
| Read Command | Response |
| AT+CGSMS? | +CGSMS: <service> OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <service> | 0 Packet Domain 1 circuit switched 2 Packet Domain preferred (use circuit switched if GPRS not available) 3 circuit switched preferred (use Packet Domain if circuit switched not available) |

7.13 AT+EGTP GPRS Transfer Preference

This command is to set or to get GPRS transfer preference. It is only available when `__MONITOR_PAGE_DURING_TRASFER__` is defined

| | |
|------------------------------|---|
| Test Command | Response |
| AT+EGTP=? | +EGTP: (list of supported <state>s) OK |
| Write Command | Response |
| AT+EGTP=<state> | OK or ERROR |
| Read Command | Response |
| AT+EGTP? | +EGTP: <state> OK |
| Reference | Note This command goes along with the feature option: MONITOR_PAGE_DURING_TRANSFER. For feature phone projects, this command is only used for test purposes. The synchronization and simultaneous access from AT and MMI interfaces are not supported. It is only supported in full AT command set |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <state> | 0 – DATA PREFER 1 – CALL PREFER Other values are reserved and will result in an ERROR response to the execution command |

8 Mobile Termination Errors

8.1 AT+CMEE CME ERROR configuration

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

Test command returns values supported as a compound value.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+CMEE=? | +CMEE: (list of supported <n>s) OK |
| Read Command | Response |
| AT+CMEE? | +CMEE: <n> OK |
| Write Command | Response |
| AT+CMEE=[<n>] | OK |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | <p>0 disable +CME ERROR: <err> result code and use ERROR instead</p> <p>1 enable +CME ERROR: <err> result code and use numeric <err> values (refer next sub clause)</p> <p>2 enable +CME ERROR: <err> result code and use verbose <err> values (refer next sub clause)</p> <p><err> values (numeric format followed by verbose format):</p> <p>9.2.1 General errors</p> <p>0 phone failure</p> <p>1 no connection to phone</p> <p>2 phone adaptor link reserved</p> <p>3 operation not allowed</p> <p>4 operation not supported</p> <p>5 PH SIM PIN required</p> <p>6 PH-FSIM PIN required</p> <p>7 PH-FSIM PUK required</p> <p>10 SIM not inserted</p> <p>11 SIM PIN required</p> <p>12 SIM PUK required</p> <p>13 SIM failure</p> <p>14 SIM busy</p> <p>15 SIM wrong</p> <p>16 incorrect password</p> <p>17 SIM PIN2 required</p> <p>18 SIM PUK2 required</p> <p>20 memory full</p> <p>21 invalid index</p> <p>22 not found</p> <p>23 memory failure</p> <p>24 text string too long</p> <p>25 invalid characters in text string</p> <p>26 dial string too long</p> <p>27 invalid characters in dial string</p> <p>30 no network service</p> <p>31 network timeout</p> <p>32 network not allowed - emergency calls only</p> <p>40 network personalization PIN required</p> <p>41 network personalization PUK required</p> <p>42 network subset personalization PIN required</p> <p>43 network subset personalization PUK required</p> <p>44 service provider personalization PIN required</p> <p>45 service provider personalization PUK required</p> <p>46 corporate personalization PIN required</p> |

47 corporate personalization PUK required
48 hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)
100 unknown
9.2.2 GPRS-related errors
9.2.2.1 Errors related to a failure to perform an Attach
103 Illegal MS (#3)
106 Illegal ME (#6)
107 GPRS service not allowed (#7)
111 PLMN not allowed (#11)
112 Location area not allowed (#12)
113 Roaming not allowed in this location area (#13)
(Values in parentheses are TS 24.008 cause codes.)
9.2.2.2 Errors related to a failure to Activate a Context
132 service option not supported (#32)
133 requested service option not subscribed (#33)
134 service option temporarily out of order (#34)
149 PDP authentication failure
(Values in parentheses are TS 24.008 cause codes.)
9.2.2.3 Other GPRS errors
150 invalid mobile class
148 unspecified GPRS error
Other values in the range 101-150 are reserved for use by GPRS

9 Annex C(27.007)

Overview of Annex AT Commands:

| AT Command | Description |
|------------------|-------------|
| AT+FCLASS | Fax class |
| AT+VTS | DTMF tones |

9.1 AT+FCLASS Fax class

Puts the TA in a specific mode of operation. This causes the TA to process information in a manner suitable for that type of information.

| | |
|----------------------------|---------------------------------------|
| Test Command | Response |
| AT+FCLASS=? | (list of supported <n>s) OK |
| Read Command | Response |
| AT+FCLASS? | <n> OK |
| Write Command | Response |
| AT+FCLASS=<n> | OK |

| Parameters | Description |
|------------------|---|
| <n> | 0 data 1 fax class 1 (TIA-578-A) 2 fax (manufacturer specific) 2.0 fax class 2 (ITU T T.32 [12] and TIA 592) |

9.2 AT+VTS DTMF tones

Allows the transmission of DTMF tones. The command is write-only.

Note: The command is used only during voice calls.

| | |
|----------------------------|--|
| Test Command | Response |
| AT+VTS=? | (list of supported <DTMF>s) OK |
| Write Command | Response |
| AT+VTS=<dtmf> | OK |
| Reference | <p>Note</p> <p>When modem work with application (ex: WM smart phone RIL or ECMT tool) , the application expect the result of AT+VTS is returned immediately . Since user might press keypad to send DTMF very fast, so application would like to send DTMF before the previous DTMF is actually processed in NW (modem shall help to queue the DTMF request if previous is not finished yet). So we will response the result code immediately to prevent blocking the application's DTMF keypad handling.</p> <p>Currently, we only check if the digit is valid and if there is any call ongoing(ex: dialing , active exist). If yes, then we will return "OK". But please notice the "OK" doesn't imply that the DTMF is really processed successfully in NW. ex: it might fail due to MS doesn't have user connection yet. Or it might be fail due to there is no response from NW. Or it might be fail due to there is no speech channel (ex: data call) If __VTS_LATE_RESPONSE__ is turned on, "OK" is printed when SEND DTMF is acknowledged by network</p> |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <DTMF> | <p>A single ASCII character in the set .0-9, #, *, A-D.</p> <p>For example: AT+VTS = 9 or AT+VTS = A</p> <p>You can use multiple command to achieve continuous DTMF tones.</p> <p>For example : AT+VTS=6;+VTS=2;+VTS=8;+VTS=2</p> |

10 SMS AT Commands(27.005)

Overview of SMS AT Commands:

| AT Command | Description |
|---------------------------|--------------------------------------|
| AT+CSMS | Select Message Service |
| AT+CPMS | Preferred Message Storage |
| AT+CMGF | Message Format |
| AT+CSCA | Service Center Address |
| AT+CSMP | Set Text Mode Parameters |
| AT+CSDH | Show Text Mode Parameters |
| AT+CSCB | Select Cell Broadcast Message Types |
| AT+CSAS | Save Settings |
| AT+CRES | Restore Settings |
| AT+CNMI | New Message Indications to TE |
| AT+CMGL(Text mode) | List Message |
| AT+CMGL(PDU mode) | List Message |
| AT+CMGR(Text mode) | Read Message |
| AT+CMGR(PDU mode) | Read Message |
| AT+CNMA(Text mode) | New Message Acknowledgement to ME/TA |
| AT+CNMA(PDU mode) | New Message Acknowledgement to ME/TA |
| AT+CMGS(Text mode) | Send Message |
| AT+CMGS(PDU mode) | Send Message |
| AT+CMSS(Text mode) | Send Message from Storage |
| AT+CMSS(PDU mode) | Send Message from Storage |
| AT+CMGW(Text mode) | Write Message to Memory |
| AT+CMGW(PDU mode) | Write Message to Memory |
| AT+CMGD | Delete Message |
| AT+CMGC(Text mode) | Send Command |
| AT+CMGC(PDU mode) | Send Command |
| AT+CMMS | More Message to Send |
| AT+EQSI | Query storage index |

AT+EMGR(PDU mode)

Read Message (for phone suite)

Please refer to 27.005 Sec 3.1 Parameter Definition to see more details of the parameter fields in each command.

10.1 AT+CSMS Select Message Service

Selects the message service and returns the type of messages supported by the ME. If chosen service is not supported by the ME (but supported by the TA), +CME ERROR is returned.

| | |
|--------------------------------|--|
| Test Command | Response |
| AT+CSMS=? | +CSMS: (list of supported <service>s) OK |
| Read Command | Response |
| AT+CSMS? | +CSMS: <service>,<mt>,<mo>,<bm> OK |
| Write Command | Response |
| AT+CSMS=<service> | +CSMS: <mt>,<mo>,<bm> OK or +CMS ERROR: <err> |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <service> | 0 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] 1 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of <service> setting 1 is mentioned under corresponding command descriptions) |

| | | |
|------|---|--------------------|
| <mt> | 0 | type not supported |
| | 1 | type supported |
| <mo> | 0 | type not supported |
| | 1 | type supported |
| <bm> | 0 | type not supported |
| | 1 | type supported |

10.2 AT+CPMS Preferred Message Storage

Selects memory storage spaces to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), +CME ERROR is returned.

| | |
|--|---|
| Test Command | Response |
| AT+CPMS=? | +CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK |
| Read Command | Response |
| AT+CPMS? | +CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK or +CMS ERROR: <err> |
| Write Command | Response |
| AT+CPMS=<mem1>[<mem2>,<mem3>] | +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK or +CMS ERROR: <err> |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

Parameters are defined below:

| Parameters | Description |
|-------------------------------------|--|
| < mem1> < mem2> < mem3> | ("SM", "ME", "SM_P", "ME_P", "MT"), ("SM", "ME", "SM_P", "ME_P", "MT"), ("SM", "ME", "SM_P", "ME_P", "MT") |
| < uesd1> < uesd2> < uesd3> | Integer |
| < total1> < total2> < total3> | Integer |

10.3 AT+CMGF Message Format

Sets the input and output format to be used by the TA.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+CMGF=? | +CMGF: (list of supported <mode>s) OK |
| Read Command | Response |
| AT+CMGF? | +CMGF: <mode> OK |
| Write Command | Response |
| AT+CMGF=[<mode>] | OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------|--|
| <mode> | 0 PDU mode (default when implemented) 1 text mode |

10.4 AT+CSCA Service Center Address

Updates the SMCS address, through which mobile-originated SMSs are transmitted. In text mode, the setting is used by send (AT+CMGS) and write (AT+CMGW) commands. In PDU mode, the setting is used by the same commands, but only when the length of the SMCS

address (coded into <pdu> parameter) equals zero.

| | |
|--|--|
| Test Command | Response |
| AT+CSCA=? | OK |
| Read Command | Response |
| AT+CSCA? | +CSCA: <sca>,<tosca> OK |
| Write Command | Response |
| AT+CSCA=<sca>[,<tosca>] | OK |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

Parameters are defined below:

| Parameters | Description |
|----------------------|----------------|
| <sca> | integer |
| <tosca> | integer |

10.5 AT+CSMP Set Text Mode Parameters

Setting Text Mode Parameters. Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>.

| | |
|------------------|---|
| Test Command | Response |
| AT+CSMP=? | OK |
| Read Command | Response |
| AT+CSMP? | +CSMP: <fo>,<vp>,<pid>,<dc> OK |

| | |
|---|--|
| Write Command | Response |
| AT+CSMP=[<fo>[,<vp>[,<pid>[,<dc>]]]] | OK |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

Parameters are defined below:

| Parameters | Description |
|--------------------|--------------|
| <fo> | Uint8 |
| <vp> | Uint8 |
| <pid> | Uint8 |
| <dc> | Uint8 |

10.6 AT+CSDH Show Text Mode Parameters

Set command controls whether detailed header information is shown in text mode result codes. Test command returns supported values as a compound value.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+CSDH=? | +CSDH: (list of supported <show>s) OK |
| Read Command | Response |
| AT+CSDH? | +CSDH: <show> OK |
| Write Command | Response |
| AT+CSDH=[<show>] | OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|----------------|
| <show> | integer |

10.7 AT+CSCB Select Cell Broadcast Message Types

Selects which types of CBMs are to be received by the ME.

| | |
|--|---|
| Test Command | Response |
| AT+CSCB=? | +CSCB: (list of supported <mode>s) OK |
| Read Command | Response |
| AT+CSCB? | +CSCB: <mode>,<mids>,<dcss> OK |
| Write Command | Response |
| AT+CSCB=[<mode>[,<mids>[,<dcss>]] | OK or +CMS ERROR: <err> |

Reference

Note1

For <mids> of <mode>=0, our design is to open the <mids> from user input and close other <mids>. In the following case, user input <mode>=0 and <mids>=2. So open channel 2 and close other channel (channel 1).

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0,"2","2"

OK

AT+CSCB?

+CSCB: 0,"2","1,2"

OK

In the following case, user input <mode>=0 without <mids>. So don't open any channel and close other channel (channel 1).

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0

OK

AT+CSCB?

+CSCB: 0,"","1"

OK

For <dcss> of <mode>=0, our design is to **increase** the <dcss> from user input.

In the following case, user input <mode>=0 and <dcss>=2. So **increase** language 2.

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0,"2","2"

OK

AT+CSCB?

+CSCB: 0,"2","1,2"

OK

In the following case, user input <mode>=0 without <dcss>. So don't **increase** any language.

AT+CSCB?

+CSCB: 0,"1","1"

OK

AT+CSCB=0

OK

AT+CSCB?

+CSCB: 0,"","1"

OK

| | |
|-----------|--|
| Reference | <p>Note2</p> <p>For <mids> of <mode>=1, our design is to close all <mids> no matter with <mids> or not.</p> <p>In the following case, user input <mode>=1. So close all channel.</p> <p>AT+CSCB?</p> <p>+CSCB: 0,"2","1,2"</p> <p>OK</p> <p>AT+CSCB=1,"2","2"</p> <p>OK</p> <p>AT+CSCB?</p> <p>+CSCB: 1,"","1"</p> <p>OK</p> <p>In the following case, user input <mode>=1 without <mids>. Also close all channel.</p> <p>AT+CSCB?</p> <p>+CSCB: 0,"1","1"</p> <p>OK</p> <p>AT+CSCB=1</p> <p>OK</p> <p>AT+CSCB?</p> <p>+CSCB: 1,"","1"</p> <p>OK</p> <p>For <dcss> of <mode>=1, our design is to decrease the <dcss> from user input.</p> <p>In the following case, user input <mode>=1 and <dcss>=2. So decrease language 2.</p> <p>AT+CSCB?</p> <p>+CSCB: 0,"2","1,2"</p> <p>OK</p> <p>AT+CSCB=1,"2","2"</p> <p>OK</p> <p>AT+CSCB?</p> <p>+CSCB: 1,"","1"</p> <p>OK</p> <p>In the following case, user input <mode>=1 without <dcss>. So don't decrease any language.</p> <p>AT+CSCB?</p> <p>+CSCB: 0,"1","1"</p> <p>OK</p> <p>AT+CSCB=1</p> <p>OK</p> <p>AT+CSCB?</p> <p>+CSCB: 1,"","1"</p> <p>OK</p> |
|-----------|--|

| | |
|-----------|--|
| Reference | <p>Usage Note</p> <p><mid> 3GPP TS 23.041 CBM Message Identifier in integer format</p> <p><dcss> depending on the command or result code: 3GPP TS 23.038 SM Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format</p> <p>We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT</p> |
|-----------|--|

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | <p>0 message types specified in <mids> and <dcss> are accepted</p> <p>1 message types specified in <mids> and <dcss> are not accepted</p> |
| <mids> | We support 10 message identifiers at most. |
| string type | all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); |
| <dcss> | string type; all different possible combinations of CBM data coding schemes (refer <dcss>) (default is empty string); e.g. "0-3,5" |

10.8 AT+CSAS Save Settings

Execution command saves active message service settings to a non-volatile memory.

Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.

| | |
|----------------------------------|--|
| Test Command | Response |
| AT+CSAS=? | <p>+CSAS: (list of supported <profile>s)</p> <p>OK</p> |
| Write Command | Response |
| AT+CSAS[=<profile>] | <p>OK</p> <p>or</p> <p>+CMS ERROR: <err></p> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------------|--|
| <profile> | 0-3 manufacturer specific profile number where settings are to be stored |

10.9 AT+CRES Restore Settings

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored.

| | |
|----------------------------------|---|
| Test Command | Response |
| AT+CRES=? | +CRES: (list of supported <profile>s) OK |
| Write Command | Response |
| AT+CRES[=<profile>] | OK or +CMS ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------------|--|
| <profile> | 0...3 manufacturer specific profile number where settings are to be stored |

10.10 AT+CNMI New Message Indications to TE

Selects the procedure how the reception of new messages from the network is indicated to the TE when TE is active (DTR signal is ON). IF TE is inactive (DTR signal OFF), message reception is carried out as specified in GSM 03.38. This command enables the unsolicited result codes +CMT, +CMTI, +CBM, and +CDS. (Please refer to 07.07 for more detail)

If received new SMS, Ring pin will change status as below table.

| | |
|---|---|
| Test Command | Response |
| AT+CNMI=? | +CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) OK |
| Write Command | Response |
| AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds> [,<bfr>]]]]] | OK or +CMS ERROR: <err> |
| Read Command | Response |
| AT+CNMI? | +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | 0 disable unsolicited result code 1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. 3 Forward unsolicited result codes directly to the TE. TA-TE link specific in band technique used to embed result codes and data when TA is in on-line data mode |

| | |
|--------------------|---|
| <mt> | <p>0 No SMS-DELIVER indications are routed to the TE.</p> <p>1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index></p> <p>2 SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>, [<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>, <length>] <CR><LF><data> (text mode enabled; about parameters in italics, refer command Show Text Mode Parameters +CSDH)</p> <p>3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1</p> |
| <bm> | <p>0 No CBM indications are routed to the TE.</p> <p>2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> (text mode enabled) If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).</p> <p>3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1</p> |
| <ds> | <p>0 No SMS-STATUS-REPORTs are routed to the TE.</p> <p>1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled); or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)</p> |
| <bfr> | <p>0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode>1 is entered (OK response shall be given before flushing the codes).</p> <p>1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.</p> |

Module status

Ring pin status

| | |
|---|---|
| Standby | HIGH |
| Received SMS | When receiving SMS the RI will be changed to LOW and hold at low level for about 120 ms then it is changed to HIGH' meanwhile the module Will report following URCs: +CMTI: +CMT: +CDS: |
| TCPIP events | When execute following TCPIP AT command, the RI will be changed to LOW and hold at low level for about 120 ms, then it is changed to HIGH. (1) TCP create the connect by AT+CIPSTART command (2) TCP close the connect by AT+CIPCLOSE command |
| Note: For L216, Ring pin is named as RING1 . | |

10.11 AT+CMGL(Text mode) List Message

Returns messages with status value <stat> from returned message in preferred storage to the TE.

| Test Command | Response |
|------------------|--|
| AT+CMGL=? | +CMGL: (list of supported <stat>s) OK |

| Write Command | Response |
|-------------------------------|---|
| AT+CMGL[=<stat>] | <p>if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:</p> <p>+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]] OK</p> <p>if text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs:</p> <p>+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]] OK</p> <p>if text mode (+CMGF=1), command successful and SMS-COMMANDs:</p> <p>+CMGL: <index>,<stat>,<fo>,<ct> OK</p> |
| Reference | Note |

10.12 AT+CMGL(PDU mode) List Message

Returns messages with status value <stat> from returned message in preferred storage to the TE.

| Test Command | Response |
|------------------|---|
| AT+CMGL=? | <p>+CMGL: (list of supported <stat>s) OK</p> |

| Write Command | Response |
|-------------------------------|--|
| AT+CMGL[=<stat>] | if PDU mode (+CMGF=0) and command successful: +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu> [<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length> <CR><LF><pdu> [...]] OK otherwise: +CMS ERROR: <err> |
| Reference | Note |

10.13 AT+CMGR(Text mode) Read Message

Returns messages with location value <index> from preferred message storage <mem1> to the TE. If the status of the message is .received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned.

| Test Command | Response |
|------------------|-----------|
| AT+CMGR=? | OK |

| Write Command | Response |
|------------------------------|---|
| AT+CMGR=<index> | <p>if text mode (+CMGF=1), command successful and SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dc>,<vp>],<sca>,<tosca>,<length>]<CR><LF><data> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-STATUSREPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>[,<pid>,<mn>],[<da>],[<toda>],<length>]<CR><LF><cdata> OK</p> <p>if text mode (+CMGF=1), command successful and CBM storage: +CMGR: <stat>,<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> OK</p> <p>otherwise: +CMS ERROR: <err></p> |
| Reference | Note |

10.14 AT+CMGR(PDU mode) Read Message

Returns messages with location value <index> from preferred message storage <mem1> to the TE. If the status of the message is .received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned.

| | |
|------------------------------|--|
| Test Command | Response |
| AT+CMGR=? | OK |
| Write Command | Response |
| AT+CMGR=<index> | if PDU mode (+CMGF=0) and command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> OK otherwise: +CMS ERROR: <err> |
| Reference | Note |

10.15 AT+CNMA(Text mode) New Message Acknowledgement to ME/TA

Execution command confirms correct reception of a new message (SMS-DELIVER or SMSSTATUS-REPORT) which is routed directly to the TE. This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1.

| | |
|---|--------------------------------|
| Test Command | Response |
| AT+CNMA=? | OK |
| Execution Command | Response |
| if text mode (+CMGF=1): AT+CNMA | +CMS ERROR: <err> |
| Reference | Note |

10.16 AT+CNMA(PDU mode) New Message Acknowledgement to ME/TA

Execution command confirms correct reception of a new message (SMS-DELIVER or SMSSTATUS-REPORT) which is routed directly to the TE. This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1.

| | |
|---|--|
| Test Command | Response |
| AT+CNMA=? | if PDU mode (+CMGF=0): +CNMA: (0-2),(0-178) OK |
| Write Command | Response |
| if PDU mode (+CMGF=0): AT+CNMA[=<n>[,<length>[<CR>PDU is given<ctrl-Z/ESC>]]] | OK or +CMS ERROR: <err> |
| Reference | Note |

10.17 AT+CMGS(Text mode) Send Message

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery.

| | |
|---|---|
| Test Command | Response |
| AT+CMGS=? | OK |
| Write Command | Response |
| if text mode (+CMGF=1): AT+CMGS=<da>[,<toda>]<CR> <i>text is entered<ctrl-Z/ESC></i> | if text mode (+CMGF=1) and sending successful: +CMGS: <mr>[,<scts>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note |
| | We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

10.18 AT+CMGS(PDU mode) Send Message

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery.

| | |
|--|--|
| Test Command | Response |
| AT+CMGS=? | OK |
| Write Command | Response |
| if PDU mode (+CMGF=0): AT+CMGS=<length><CR> <i>PDU is given<ctrl-Z/ESC></i> | if PDU mode (+CMGF=0) and sending successful: +CMGS: <mr>[,<ackpdu>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

10.19 AT+CMSS(Text mode) Send Message from Storage

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery.

| | |
|--|---|
| Test Command | Response |
| AT+CMSS=? | OK |
| Write Command | Response |
| AT+CMSS=<index>[,<da>[,<toda>]] | if text mode (+CMGF=1) and sending successful: +CMSS: <mr>[,<scts>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note |

10.20 AT+CMSS(PDU mode) Send Message from Storage

Execution command sends message with location value <index> from message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery.

| | |
|--|--|
| Test Command | Response |
| AT+CMSS=? | OK |
| Write Command | Response |
| AT+CMSS=<index>[,<da>[,<toda>]] | if PDU mode (+CMGF=0) and sending successful: +CMSS: <mr>[,<ackpdu>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

10.21 AT+CMGW(Text mode) Write Message to Memory

Execution command stores a message to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given, support "stored unsent" and "stored sent"

| | |
|--|--|
| Test Command | Response |
| AT+CMGW=? | OK |
| Write Command | Response |
| if text mode (+CMGF=1): AT+CMGW[=<oa/da>[,<toa/oda>[,<stat>]]]<CR> <i>text is entered<ctrl-Z/ESC></i> | +CMGW: <index> OK or +CMS ERROR: <err> |

| | |
|-----------|--|
| Reference | Note |
| | We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT |

10.22 AT+CMGW(PDU mode) Write Message to Memory

Execution command stores a message to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given, support 'stored unsent' and "stored sent"

| | |
|---|--|
| Test Command | Response |
| AT+CMGW=? | OK |
| Write Command | Response |
| if PDU mode (+CMGF=0): +CMGW=<length>[,<stat>]<CR> <i>PDU is given<ctrl-Z/ESC></i> | +CMGW: <index> OK Or +CMS ERROR: <err> |
| Reference | Note |
| | is only supported for phone suite. Others can't use this command to do test. <input type="checkbox"/> We don't support "+CMS ERROR" when AT command set is SLIM_AT or ULC_AT Change History: 7 "DRAFT" of <stat> is available from 09B.1017MP |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <stat> | the status of message in memory; defined values: 0 "REC UNREAD" received unread message (i.e. new message) 1 "REC READ" received read message 2 "STO UNSENT" stored unsent message (only applicable to SMSs) 3 "STO SENT" stored sent message (only applicable to SMSs) 4 "ALL" all messages (only applicable to +CMGL command) 7 "DRAFT" |

10.23 AT+CMGD Delete Message

Deletes message from preferred message <mem1> (see AT+CPMS) storage location <index>. If deletion fails, +CMS ERROR is returned.

| | |
|--|---|
| Test Command | Response |
| AT+CMGD=? | +CMGD: (list of supported<index>s)[,(list of supported <delflag>s)] OK |
| Write Command | Response |
| AT+CMGD=<index>[,<delflag>] | OK or +CMS ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------------|--|
| <delflag> | 0 (or omitted) Delete the message specified in <index> 1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched 2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched 3 Delete all read messages from preferred message storage, sent and unsent mobile originated Messages leaving unread messages untouched. 4 Delete all messages from preferred message storage including unread messages. |

10.24 AT+CMGC(Text mode) Send Command

Execution command sends a command message from a TE to the network (SMSCOMMAND).

| | |
|---|---|
| Test Command | Response |
| AT+CMGC=? | OK |
| Write Command | Response |
| if text mode (+CMGF=1): +CMGC=<fo>,<ct>[,<pid>[,<mn>[,<da>[,<today>]]]]<CR> <i>text is entered<ctrl-Z/ESC></i> | if text mode (+CMGF=1) and sending successful: +CMGC: <mr>[,<scts>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note |

10.25 AT+CMGC(PDU mode) Send Command

Execution command sends a command message from a TE to the network (SMSCOMMAND).

| | |
|--|--|
| Test Command | Response |
| AT+CMGC=? | OK |
| Write Command | Response |
| if PDU mode (+CMGF=0): +CMGC=<length><CR> <i>PDU is given<ctrl-Z/ESC></i> | if PDU mode (+CMGF=0) and sending successful: +CMGC: <mr>[,<ackpdu>] OK if sending fails: +CMS ERROR: <err> |
| Reference | Note |

10.26 AT+CMMS More Message to Send

Set command controls the continuity of SMS relay protocol link. When feature is enabled (and supported by network) multiple messages can be sent much faster as link is kept open. Test command returns supported values as a compound value.

| | |
|----------------------------|---|
| Test Command | Response |
| AT+CMMS=? | +CMMS: (list of supported <n>s) OK |
| Read Command | Response |
| AT+CMMS? | +CMMS: <n> OK |
| Write Command | Response |
| AT+CMMS=[<n>] | if PDU mode (+CMGF=0) and sending successful: OK if sending fails: +CMS ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------|---|
| <n> | 0 disable 1 reserve 2 enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <n>=0) |

10.27 AT+EQSI Query storage index

To query storage index.

| | |
|--------------------------------|--|
| Test Command | Response |
| AT+EQSI=? | +EQSI: (list of supported<storage>s) OK |
| Write Command | Response |
| AT+EQSI=<storage> | +EQSI: <storage>, <begin>, <end>, <used> OK |
| | Or ERROR |
| Reference | Note This command is only supported for phone suite. Others can't use this command to do test |

Parameters are defined below:

| Parameters | Description |
|------------------------|---------------------------------|
| <storage> | string type; SM or ME |
| <begin> | beginning of index |
| <end> | ending of index |
| <used> | number of messages in <storage> |

10.28 AT+EMGR(PDU mode) Read Message (for phone suite)

Returns messages with location value <index> from preferred message storage <mem1> to the TE. If the status of the message is .received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned. It is similar with AT+CMGR (PDU mode). <stat> is different.

| | |
|------------------|-----------|
| Test Command | Response |
| AT+EMGR=? | OK |

| | |
|------------------------------|---|
| Write Command | Response |
| AT+EMGR=<index> | <p>if PDU mode (+CMGF=0) and command successful: +EMGR: <stat>,<alpha>,<length><CR><LF><pdu> OK</p> <p>otherwise: +CMS ERROR: <err></p> |
| Reference | <p>Note</p> <p>The command is available from 09B.1017MP</p> <p>This command is only supported for phone suite. Others can't use this command to do test.</p> |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <stat> | <p>the status of message in memory; defined values:</p> <p>0 "REC UNREAD" received unread message (i.e. new message)</p> <p>1 "REC READ" received read message</p> <p>2 "STO UNSENT" stored unsent message (only applicable to SMS)</p> <p>3 "STO SENT" stored sent message (only applicable to SMS)</p> <p>4 "ALL" all messages (only applicable to +CMGL command)</p> <p>7 "DRAFT"</p> |

10.29 AT+EMGR(Text mode) Read Message

Returns messages with location value <index> from preferred message storage <mem1> to the TE. If the status of the message is .received unread., the status in the storage changes to .received read.. If reading fails, +CMS ERROR is returned.

| | |
|------------------|-----------|
| Test Command | Response |
| AT+EMGR=? | OK |

| Write Command | Response |
|------------------------------|--|
| AT+EMGR=<index> | <p>if text mode (+CMGF=1), command successful and SMS-DELIVER: +EMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-SUBMIT: +EMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dc>,<vp>],<sca>,<tosca>,<length>]<CR><LF><data> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-STATUSREPORT: +EMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> OK</p> <p>if text mode (+CMGF=1), command successful and SMS-COMMAND: +EMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR><LF><cdata> OK</p> <p>if text mode (+CMGF=1), command successful and CBM storage: +EMGR: <stat>,<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> OK</p> <p>otherwise: +CMS ERROR: <err></p> |
| Reference | Note |

11 Hardware Testing AT Commands

Overview of Hardware Testing AT Commands:

| AT Command | Description |
|-----------------|--------------------------|
| AT+CASP | Audio Sound Play |
| AT+EALT | Audio Sound Playback |
| AT+ESAM | Set Audio Mode |
| AT+EGMR | Mobile Revision and IMEI |
| AT+ESLP | Sleep Mode |
| AT+CSCLK | Configure Slow Clock |

These AT commands are designed for tools to do factory hardware testing and should be tested exclusively. Test only one command/item at the same time.

11.1 AT+CASP Audio Sound Play

This command handles the Audio Sound Play operation. We use this command to playback one exist audio ring sound. The sound id should refer to the existing ring sound number. You have to make sure the source ID is correct, otherwise it won't have any response.

| | |
|---|--|
| Test Command | Response |
| AT+CASP=? | +CASP: <1-2>,<id>[,<0-3>[,<1-25>[,<0-6>[,<0-7>]]]] OK |
| Write Command | Response |
| AT+CASP = <op>,<sound_id>[,<style> [, <timeout> [, <volume> [, <out_path>]]]] | OK or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-------------------------|---|
| <op> | operation 1 Play one audio ring sound 2 Stop one audio ring sound |
| <sound_id> | Sound id(sound id <=80) |
| <style> | Play back style (When op= 1required) 0 CRESCENDO 1 INFINITE 2 ONCE 3 DESCENDO(NS) |
| <Timeout> | Timeout timer 1-25 Seconds (Apply to all style. no default value: if not given, it will keep playing) |
| <volume> | volume 0-6 Adjust the volume |

| <out_path> | Out device |
|------------|-----------------|
| 0 | SPEAKER |
| 1 | MICROPHONE |
| 2 | BUZZER |
| 3 | GMI |
| 4 | SPEAKER2 |
| 5 | LOUDSPEAKER |
| 6 | Both of speaker |

Example:

| Commands | Response |
|-------------------------|-----------|
| AT+CASP=1,15,0,3 | OK |
| AT+CASP=1,5,1 | OK |
| AT+CASP=2,5 | OK |

11.2 AT+EALT Audio Sound Playback

This Command is used to turn on/off the loop back test.

| | |
|---------------------------|--|
| Test Command | Response |
| AT+EALT=? | +EALT: (list of supported <op>s) OK |
| Write Command | Response |
| AT+EALT=<op> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------|---|
| op | 0 turn off the loop back test. 1 turn on the loop back test. |

11.3 AT+ESAM Set Audio Mode

This Command is used to set audio mode. We have three audio mode , normal, loud speaker and handset.

| | |
|-----------------------------|--|
| Write Command | Response |
| AT+ESAM=<mode> | OK |
| Test Command | Response |
| AT+ESAM=? | +ESAM: (0-2) OK |
| Reference | Note For L206(D) module, only mode 2 will take effect |

Parameters are defined below:

| Parameters | Description |
|-------------|--|
| mode | 0 normal 1 handset 2 loudspeaker |

11.4 AT+EGMR Mobile Revision and IMEI

This command is used to get mobile revision and IMEI for Engineer mode and factory test using.

The set operation only apply for IMEI, Serial Number and SV.

Setting new IMEI needs to reboot the target, then IMEI can take effect.

| | |
|--|--|
| Test Command | Response |
| AT+EGMR=? | + EGMR: (0,1),(0-5,7-9) OK |
| Write Command | Response |
| AT+EGMR=<op>,<type>[,<str>] | When type = (1-7, 9): [+EGMR: "str"] OK When type = 8 (+EGMR=0,8 to get MMI resource): +AUDIO: "ver" +IMAGE: "ver" +FONT: "ver" +STR: "ver" OK |
| Reference | Example 3. read IMEI: AT+EGMR=0,7 +EGMR: "135790246811220" OK 4. Write IMEI: AT+EGMR=1,7,"123451234512345" OK AT+EGMR=0,7 +EGMR: "123451234512345" OK 5. read SV of IMEISV AT+EGMR=0,9 +EGMR: "78" OK 6. Write SV AT+EGMR=1,9,"01" OK AT+EGMR=0,9 +EGMR: "01" OK |

| | |
|-----------|--|
| Reference | Note |
| | <type> = 10, 11, and 12 are only turned on when GEMINI, GEMINI+ with 3 or more SIM, and GEMINI+ with 4 SIM respectively. |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <op> | 0 get 1 Set |
| <type> | 0 Baseband chipset (only for op= 0) 1 DSP code (only for op= 0) 2 DSP patch (only for op= 0) 3 MCU software (only for op= 0) 4 MS board(hardware) (only for op= 0) 5 Serial Number 6 Melody revision (only for op=0) 7 SIM1 IMEI 8 MMI resource ver. (only for op=0) 9 SV (Software Version in IMEISV: 2 digit 10 SIM2 IMEI 11 SIM3 IMEI 12 SIM4 IMEI |
| <str> | Input/output string |

□□□□□

11.5 AT+ESLP Sleep Mode

This Command is used to enable and disable sleep mode in the mobile.

| | |
|---------------------------|-----------------------------------|
| Test Command | Response |
| AT+ESLP=? | +ESLP: (0, 1) OK |
| Write Command | Response |
| AT+ESLP=<op> | OK |

Parameters are defined below:

| Parameters | Description |
|-------------------|-----------------------------|
| <op> | 0 disable 1 enable |

11.6 AT+CSCLK Configure Slow Clock

This Command is used to Configure Slow Clock.

| | |
|---------------------------|---|
| Test Command | Response |
| AT+CSCLK=? | +CSCLK: (list of supported <n>s) OK |
| Read Command | Response |
| AT+CSCLK? | +CSCLK: <n> OK |
| Write Command | Response |
| AT+CSCLK=<n> | OK Or ERROR |
| Reference | <p>Note</p> <p>There are two caveats when you want to quit sleep mode in mode 2:</p> <ol style="list-style-type: none"> 1, You should input some characters (at least one) to awake module 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 baud-rate re-adaptation. <p><input type="checkbox"/>The +CSCLK value can not be reset by AT&F or ATZ command.</p> |

Parameters are defined below:

| Parameters | Description |
|------------|---|
| <n> | <p>0 Disable slow clock, module will not enter sleep mode.</p> <p>1 Enable slow clock, it is controlled by DTR. When DTR is high, module can enter sleep mode. When DTR changes to low level, module can quit sleep mode.</p> <p>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.</p> |

12 Proprietary AT Commands For PS

Overview of Proprietary AT Commands:

| AT Command | Description |
|-----------------|----------------------------------|
| AT+EPBSE | Band Selection |
| AT+EGPAU | PPP Authentication |
| AT+EPIN1 | Enter PIN1 |
| AT+EPIN2 | Enter PIN2 |
| AT+EPINC | PIN remaining attempt number |
| AT+ESMSS | SMS status change mode |
| AT+EOPN | Read Operator name |
| AT+EQERY | General query command |
| AT+EIND | Indication Control Command |
| AT+ECSQ | Received signal level indication |
| AT+EINFO | URC Information Control Command |
| AT+EBOOT | Boot up mode |

12.1 AT+EPBSE Band Selection

To set MS preferred band.

| | |
|---|--|
| Test Command | Response |
| AT+EPBSE=? | List of supported bit masks of each band mode +EPBSE: <gsm_band>, <umts_band> OK |
| Read Command | Response |
| AT+EPBSE? | +EPBSE: <gsm_band>, <umts_band> OK |
| Write Command | Response |
| AT+EPBSE=<gsm_band>[, <umts_band>] | OK The 2G module does not support <umts_band> parameter. |
| Reference | Example Set Auto band (select all supported bands) AT+EPBSE=255, 65535 OK Set "EURO band" (GSM-900 / DCS-1800 / WCDMA-IMT-2000) AT+EPBSE=10, 1 OK |
| Reference | Note 1. This command is not allowed to set each band mode, GSM or UMTS, as 0, said AT+EPBSE=<gsm_band>,0 or AT+EPBSE=0, <umts_band>. 2. If the band mode is not supported, this command will just ignore the setting 3. After using this command, user should reboot the handset to let the setting become effective if the compile option __DYNAMIC_BAND_SEL__ is not opened 4. If we get 0 in the certain field using AT+EPBSE=? , it means that the field is not supported. |

Parameters are defined below:

| Parameters | Description |
|--------------------------|---|
| <GSM_band> | bit 1 EGSM900 bit 3 DCS1800 bit 4 PCS1900 bit 7 GSM850 0xff Auto selection |
| <UMTS_band> | bit 0 UMTS BAND I : WCDMA-IMT-2000 bit 1 UMTS BAND II : WCDMA-PCS-1900 bit 2 UMTS BAND III : WCDMA-DCS-1800 bit 3 UMTS BAND IV : WCDMA-AWS-1700 bit 4 UMTS BAND V : WCDMA-CLR-850 bit 5 UMTS BAND VI : WCDMA-800 bit 6 UMTS BAND VII : WCDMA-IMT-E-2600 bit 7 UMTS BAND VIII : WCDMA-GSM-900 bit 8 UMTS BAND IX : WCDMA-1800 bit 9 UMTS BAND X : WCDMA-1700 0xffff Auto selection |

12.2 AT+EGPAU PPP Authentication

This command is used to set GPRS PPP negotiated authentication protocol.

| | |
|--|---|
| Test Command | Response |
| AT+EGPAU=? | +EGPAU: (0,1),(<cid range>),(0-1) OK |
| Write Command | Response |
| AT+EGPAU=<op>,<cid>[,<is_chap>] | OK |
| Reference | Note While <op> equal to 0,can not input <is_chap>. |

Parameters are defined below:

| Parameters | Description |
|----------------|---|
| op | 0 Read 1 Write |
| cid | Please refer to the value in test command response. |
| is_chap | 0 PAP 1 CHAP |

12.3 AT+EPIN1 Enter PIN1

This command is used to validate PUK and to define a new PIN code.

| | |
|---|---|
| Test Command | Response |
| AT+EPIN1=? | OK |
| Write Command | Response |
| AT+EPIN1=<puk>,<new_pin> | +CME ERROR: <err> |
| Read Command | Response |
| AT+EPIN1? | +EPIN1: <code> OK Or +CME ERROR: <err> |
| Reference | Note Do not use this command during power on process. During power on process, use AT+CPIN to validate PUK. <input type="checkbox"/> <input type="checkbox"/> Since this proprietary command is intended for modem project or dual-SIM/mode project . We won't handle such MMI synchronization problem or perform extra error handling <input type="checkbox"/> <input type="checkbox"/> Only used AT+EPIN1 when SIM card inserted |

Parameters are defined below:

| Parameters | Description |
|---|--|
| <puk>, <new_pin> | string type values <code> values reserved by the present document: READY MT is not pending for any password SIM PIN MT is waiting SIM PIN to be given SIM PUK MT is waiting SIM PUK to be given SIM BLOCKED PIN and PUK are blocked |

12.4 AT+EPIN2 Enter PIN2

This command is used to validate the PIN2 , or to validate PUK2 and to define a new PIN2 code.

| | |
|---|---|
| Test Command | Response |
| AT+EPIN2=? | OK |
| Read Command | Response |
| AT+EPIN2? | +EPIN2: <code> OK or +CME ERROR: <err> |
| Write Command | Response |
| AT+EPIN2=<pin2> or +EPIN2= <puk2>,<newpin2> | OK or +CME ERROR: <err> |
| Reference | Note |
| | To verify PIN2 , suggest to use AT+CPWD="P2","PIN2","PIN2". To unblock PIN2, use AT+EPIN2="PUK2","new_PIN2" <input type="checkbox"/> <input type="checkbox"/> Only used AT+EPIN2 when SIM card inserted and MT has completely boot up. |

Parameters are defined below:

| Parameters | Description |
|--|---|
| <pin2> , <newpin2> , <puk2> | string type values <code> values reserved by the present document: READY PIN2 is allowed to verified SIM PUK2 PIN2 is blocked SIM BLOCKED PIN2 and PUK2 are blocked |

12.5 AT+EPINC PIN remaining attempt number

This command queries the number of remaining valid tries for PIN1, PIN2, PUK1, and PUK2

| | |
|-------------------|--|
| Test Command | Response |
| AT+EPINC=? | OK |
| Read Command | Response |
| AT+EPINC? | +EPINC: <pin1>,<pin2>,<puk1>,<puk2> OK or +CME ERROR: <err> |
| Execution Command | Response |
| AT+EPINC | +EPINC: <pin1>,<pin2>,<puk1>,<puk2> OK or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|--|----------------------------------|
| <pin1>,<pin2>,<puk1>,<puk2> | the remaining tries of each type |

12.6 AT+ESMSS SMS status change mode

SMS status change mode after +CMGR and +CMGL

| | |
|------------------------------|---|
| Test Command | Response |
| AT+ESMSS=? | +ESMSS : (0-1) OK |
| Read Command | Response |
| AT+ESMSS? | +ESMSS : <mode> OK |
| Write Command | Response |
| AT+ESMSS=<mode> | OK |
| | Or +CME ERROR: <err> |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | 0 Un-change – SMS status remains as "REC UNREAD" after +CMGR or +CMGL 1 Change – SMS status changes from "REC UNREAD" to "REC READ" after +CMGR or +CMGL. |

12.7 AT+EOPN Read Operator name

This command returns the operator name in alphanumeric format when given the numeric format.

| | |
|--|--|
| Test Command | Response |
| AT+EOPN=? | OK |
| Write Command | Response |
| AT+EOPN=<format>,<oper_num> | +EOPN: <format>, <oper_alpha> OK or +CME ERROR: <err> |
| Reference | Note We DO NOT support full set of alphanumeric format of <oper>, since the code size will become very large. |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---|
| <format> | 0 long alphanumeric format 1 short alphanumeric format |
| <oper_num> | the operator in numeric format |
| <oper_alpha> | the operator in alphanumeric format |

12.8 AT+EQUERY General query command

To query hardware or MS status.

| | |
|-----------------------------|--|
| Write Command | Response |
| AT+EQUERY=<op> | OK or ERROR |
| Test Command | Response |
| AT+EQUERY=? | OK |
| Reference | Note We DO NOT 5,6,7 for M2M |
| Reference | Example AT+EQUERY=0 +CMGW: (0-3) // SMS support writing SMS to inbox OK AT+EQUERY=1 +CHAR: 1 // charger is plug-in OK AT+EQUERY=2 +CLAM: 0 // clam is closed OK AT+EQUERY=5 +EQMO: 1 // #if defined(__SMS_STORAGE_BY_MMI__) && defined(__GEMINI__) OK AT+EQUERY=6 +EPBV: 2 // #if defined(__PHB_STORAGE_BY_MMI__) OK AT+EQUERY=7 +ESMSV: 2 // #if defined(__SMS_STORAGE_BY_MMI__) OK |

Parameters are defined below:

| Parameters | Description |
|------------|--|
| op | <ul style="list-style-type: none"> 0 Query SMS stats to write SMS to inbox 1 Query charger status 2 Query clam status 3 Query if sms ready 4 Query if phb ready 5 Query if open compile option __SMS_STORAGE_BY_MMI__ and __GEMINI__ (for phone suite). 6 Query the PHB System module version. When defined __PHB_STORAGE_BY_MMI__, the version is 2. Else, the version is 1 7 Query the SMS System module version. When defined __SMS_STORAGE_BY_MMI__, the version is 2. Else, the version is 1. |

12.9 AT+EIND Indication Control Command

Set command to enable +EIND unsolicited result code . to indicate the readiness of SMS or PHB or AT

| | |
|-----------------------------|---|
| Test Command | Response |
| AT+EIND=? | +EIND: (0-4294967295) OK |
| Read Command | Response |
| AT+EIND? | +EIND: <ind> OK |
| Write Command | Response |
| AT+EIND=<flag> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|-------------|---|
| flag | Bit 0 Any value(0~4294967295) that bit 0 is 1 e.g. 1,3,5.. Bit 1 Any value(0~4294967295) that bit 1 is 1 e.g. 2,3,6.. Bit 2 Any value(0~4294967295) that bit 2 is 1 e.g. 4,5,.. Bit 3 Any value(0~4294967295) that bit 3 is 1 e.g. 8,9.. Bit 7 Any value(0~4294967295) that bit 7 is 1 e.g. 128,129,130.. |
| ind | 1 SMS_READY 2 PHB_READY 4 file change for PLMN files 8 file change for EONS files 16 Invalid SIM 128 AT_READY |

12.10 AT+ECSQ Received signal level indication

Set command to enable +ECSQ unsolicited result code . to indicate the received signal level.

| | |
|-----------------------------|---|
| Test Command | Response |
| AT+ECSQ=? | +ECSQ: (0-2) OK |
| Read Command | Response |
| AT+ECSQ? | +ECSQ: <flag> OK |
| Write Command | Response |
| AT+ECSQ=<flag> | OK or ERROR |
| Reference | Note Unsolicited result code format: +ECSQ: <rsssi>, <ber>,<rsssi_in_qdbm>[,<RSCP_in_qdbm>,<EcN0_in_qd bn] |

Parameters are defined below:

| Parameters | Description |
|--------------|---|
| flag | 0 Received signal level indication disable 1 Received signal level indication enable 2 Received signal level indication |
| rsssi | 0-255 Received signal strength indication |
| ber | 0-255Bit error rate |
| RSCP | RSCP In qdbm |
| EcN0 | EcN0 In qdbm |

12.11 AT+EINFO URC Information Control Command

Set command to enable some proprietary unsolicited result code(URC) information report.

| | |
|------------------------------|--|
| Test Command | Response |
| AT+EINFO=? | +EINFO: (0-4294967295) OK |
| Read Command | Response |
| AT+EINFO? | +EINFO: <flag> OK |
| Write Command | Response |
| AT+EINFO=<flag> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|-------------|---|
| flag | Bit 0 Any value(0~4294967295) that bit 0 is 1 e.g. 1,3,5.. Bit 1 Any value(0~4294967295) that bit 1 is 1 e.g. 2,3,6.. Bit 2 Any value(0~4294967295) that bit 2 is 1 e.g. 4,5,.. Bit 3 Any value(0~4294967295) that bit 3 is 1 e.g. 8,9.. Bit 7 Any value(0~4294967295) that bit 7 is 1 e.g. 128,129,130.. |

12.12 AT+EBOOT Boot up mode

This command is used to set the boot up mode for modem. If boot up in exception mode, modem will perform silent boot up, such as bypass PIN check when it has been verified before.

| Write Command | Response |
|------------------------------|---------------------------------|
| AT+EBOOT=<mode> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 Normal boot up 1 Exception boot up |

[illegible]

12.13 AT+ICCID Read ICCID of SIM Card

This command is used to read SIM card ICCID if SIM inserted. If SIM not inserted, return +CME ERROR: 10

| Execution Command | Response |
|-------------------|--|
| AT+ICCID | +ICCID: <iccid> OK ERROR / +CME ERROR: 10 |

Parameters are defined below:

| Parameters | Description |
|----------------------|-------------|
| <iccid> | string type |

13 Proprietary Unsolicited Result code

13.1 URC: +ECSQ

This URC is to report signal strength

| | |
|-------------------|---|
| Execution Command | Unsolicited result code +ECSQ: <rsi>,<ber>,<rsi_in_qdbm>[,<RSCP_in_qdbm>,<EcN0_in_qdbm>] |
|-------------------|---|

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| rsi | 0-255 Received signal strength indication level |
| ber | 0-255 Bit error rate |
| rsi_in_qdbm | Received signal strength in quarter dbm |
| RSCP_in_qdbm | RSCP in quarter dbm. Only available when camp on UMTS network |
| EcN0_in_qdbm | EcN0 in quarter dbm. Only available when camp on UMTS network |

13.2 URC: +ECFU

This URC is intended to notify application to show CFU(Call Forwarding Unconditional) icon.

| | |
|-------------------|--|
| Execution Command | Unsolicited result code +ECFU: <status>,<line> |
| Reference | Note Available after W09.04 . And it's only supported in modem load . |

Parameters are defined below:

| Parameters | Description |
|---------------|------------------------|
| status | 0 hide CFU icon |
| | 1 show CFU icon |
| line | 1 Line1 |
| | 2 Line2 |

13.3 URC: +ESPEECH

This URC is to notify application to attach the speech for voice call (user connection). It's defined in spec 24.008 section5 call control .

| | |
|-------------------|---|
| Execution Command | Unsolicited result code +ESPEECH: <on_off>,<rat>,<irho_speech_on_off> |
| Reference | Note Available after W09.12 . And it's only supported in modem load . |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---------------------------------|
| on_off | 0 Detach speech |
| | 1 Attach speech |
| Rat | 1 GSM |
| | 2 UMTS |
| | 3 GSM |
| irho_speech_on_off | 0 Not inter-rat handover |
| | 1 Is inter-rat handover |

13.4 URC: +ESMLA

This URC is to report if Auto personalization(defined in 3GPP TS 22.022) is enabled.

| | |
|-----------|--|
| | Unsolicited result code +ESMLA: <is_autolock_enabled>, <autolock_result> |
| Reference | Note Available after W08.45 |

Parameters are defined below:

| Parameters | Description |
|----------------------------|--------------------------|
| is_autolock_enabled | 0 autolock is disabled |
| | 1 autolock is enabled |
| autolock_result | 0 autolock is failed |
| | 1 autolock is successful |

13.5 URC: +ESCRI

This URC is to notify application the result of AT+ESCRI..

| | |
|-----------|--|
| | Unsolicited result code +ESCRI: <report_value> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|---------------------|------------------------------|
| report_value | 0 SCRI_REQ_SENT |
| | 1 SCRI_CS_SESSION_ONGOING |
| | 2 SCRI_PS_SIGNALLING_ONGOING |
| | 3 SCRI_NO_PS_DATA_SESSIN |
| | 4 SCRI_REQ_NOT_SENT |
| | 5 SCRI_NOT_ALLOWED |

13.6 URC: +ESIMS

Indicate the SIM is inserted or not and related cause.

| | |
|-----------|---|
| | Unsolicited result code +ESIMS: <sim_inserted_status>,<cause> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------------|----------------------------|
| sim_interted_status | 0 SIM not presented |
| | 1 SIM presented |
| case | 0 SIM_CARD_REMOVED, |
| | 1 SIM_ACCESS_ERROR, |
| | 2 //Reserved for other use |
| | 3 //Reserved for other use |
| | 4 //Reserved for oher use |
| | 5 SIM_ACCESSSS_PROFILE_ON |
| | 6 SIM_ACCESS_PROFILE_OFF |
| | 7 DUALSIM_DISCONNECTED |
| | 8 DUALSIM_CONNECTED |
| | 9 SIM_VSIM_ON |
| | 10 SIM_VSIM_OFF |
| | 11 SIM_PLUG_OUT |
| | 12 SIM_PLUG_IN |
| | 13 SIM_RECOVERY_START |
| | 14 SIM_RECOVERY_END |

13.7 URC: +EUSIM

Indicate the inserted SIM card is SIM or USIM.

The URC is control by AT+EIND command.

| | |
|-----------|--|
| | Unsolicited result code +EUSIM: <type> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-------------|-----------------|
| type | 0 SIM 1 USIM |

13.8 URC: +EESTSIM

This URC reports whether current inserted SIM is test SIM during power-on procedure.

There is no query mode for this command.

| | |
|-----------|---|
| | Unsolicited result code +EESTSIM: <is_test_sim> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|--------------------|------------------------------|
| is_test_sim | 0 normal sim. 1 test sim. |
|--------------------|------------------------------|

13.9 URC: +EPWSC

This URC is used to inform about power scan results.

| | |
|-----------|---|
| | Unsolicited result code +EPWSC: [list of supported(<arfcn>,<rssi_in_qdbm>,<sch_status>,<bcch_Status>,<end>)s] |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| arfcn | Indicated the frequency number. range 0~0xFFFFFFFF |
| rssi_in_qdbm | Received signed strength raw data in quarter dbm. |
| sch_status | 0 not decoded 1 decode failed 2 decode success |
| bcch_status | 0 not decoded 1 decode failed 2 decode success |
| end | 1 indicates end of the list. |

13.10 URC: +ECCCH

This URC is used to inform about CCCH block status.

| | |
|-----------|--|
| | Unsolicited result code +ECCCH: <status> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------|-----------------------------|
| status | 0 bad block 1 good block |

13.11 URC: +ECELLINFO

This URC is notify application the neighboring cell information.

| | |
|-----------|---|
| | Unsolicited result code +ECELLINFO:<is_valid>,<rat>,<cell_info> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------|--|
| is_valid | 0 the data is invalid 1 the data is valid |
| rat | 1 GSM 2 UMTS |

| | |
|------------------|---|
| cell_info | GSM: gas_nbr_cell_info_struct UMTS: uas_nbr_cell_info_struct |
|------------------|---|

13.12 URC: +ENWINFO

This URC is notify application the Network information.

| | |
|-----------|--|
| | Unsolicited result code +ENWINFO: <type>,<nw_info> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------|---|
| type | 0 RR_EM_CELL_SELECT_PARA_INFO 1 RR_EM_CHANNEL_DESCR_INFO 2 RR_EM_CTRL_CHANNEL_DESCR_INFO 3 RR_EM_RACH_CTRL_PARA_INFO 4 RR_EM_LAI_INFO 5 RR_EM_RADIO_LINK_COUNTER_INFO 6 RR_EM_MEASUREMENT_REPORT_INFO 7 RR_EM_CA_LIST_INFO 8 RR_EM_CONTROL_MSG_INFO 9 RR_EM_SI2Q_INFO_STRUCT_INFO 10 RR_EM_MI_INFO_STRUCT_INFO ... |
| nw_info | Network information binary data. |

Example

Here is an example for interpret RR_EM_CELL_SELECT network information URC.
NW info URC.

```
+ENWINFO: 0m060003 //0:RR_EM_CELL_SELECT_PARA_INFO
```

Pseudo code

```
uint8 data[3];
rr_em_cell_select_para_info_struct *nw_info;

data[0]=0x06;
data[1]=0x00;
data[2]=0x03;

nw_info = (rr_em_cell_select_para_info_struct*)data;
printf("crh=%s,ms_txpwr=%d,rxlev_access_min=%d",nw_info->crh,nw_info->ms_txpwr,nw_inf
o->rxlev_access_min);
```

output

crh=6,ms_txpwr=0,rxlev_access_min=3

14 GPS AT commands

Overview of GPSAT Commands:

| AT Command | Description |
|-----------------------|--|
| AT+EGDCONT | Define PDP context |
| AT+MGPSC | Power on/off GPS |
| AT+MG PSS | Send PMTK Command |
| AT+MG PSEPO | Set EPO Parameter |
| AT+MG PSTS | Set GPS Time Sync Parameter |
| AT+MG PSPPS | Set PPS output |
| AT+MG PSIPR | Specifies the GNSS uart port data rate |
| AT+GETGPS | Read GNSS information |
| AT+MG PSTIME | Send Time Aiding to GNSS |
| AT+MG PSLOC | Auto Send Location Aiding to GNSS |
| AT+MG PSSTATUS | Get The Status Of AGPS Information |
| AT+MG PSURC | AGPS Information URC control |

Note: The support of these commands depend on firmware version.

14.1 AT+EGDCONT Define PDP Context

Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

| | |
|---|---|
| Test Command | Response |
| AT+EGDCONT=? | +EGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[,...[(list of supported <pdN>s)]]] [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[,(list of supported <pd1>s)[,...[(list of supported <pdN>s)]]] [...] OK |
| Read Command | Response |
| AT+EGDCONT? | +EGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,...[,pdN]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,...[,pdN]]] [...] OK |
| Write Command | Response |
| AT+EGDCONT=<cid>,<PDP_type>,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,...[,pdN]]]]]] | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------------------------|--|
| <cid> | (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. |
| <PDP_type> | (Packet Data Protocol type) a string parameter. IP Internet Protocol (IETF STD 5) |
| <APN> | (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested. |
| <PDP_address> | a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. |
| <d_comp> | a numeric parameter that controls PDP data compression (applicable for SND CP only) 0 - off (default if value is omitted) |
| <h_comp> | a numeric parameter that controls PDP header compression 0 - off (default if value is omitted) |
| <pd1>,... <pdN> | zero to N string parameters whose meanings are specific to the <PDP_type> |

14.2 AT+MGPSC Power on/off GPS

Control GPS state -- power on/off GPS receiver.

| | |
|-------------------------------|---|
| Test Command | Response |
| AT+MGPSC=? | +MGPSC: (0-1) OK |
| Read Command | Response |
| AT+MGPSC? | +MGPSC: <state> OK |
| Write Command | Response |
| AT+MGPSC=<state> | OK +CME ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <state> | <u>0</u> power off GPS 1power on GPS |

Example:

| Commands | Response |
|-------------------|-------------------------------|
| AT+MGPSC=1 | // Power on GPS OK |
| AT+MGPSC=0 | // Power off GPS OK |

14.3 AT+MGPSS Send PMTK Command

Send MTK private GPS command – PMTK command to GPS chip.

| | |
|------------------------------|--|
| Test Command | Response |
| AT+MGPSS=? | OK |
| Write Command | Response |
| AT+MGPSS=<pmtk> | OK |
| | +CME ERROR: <err> |
| Reference | Note 1. This Command can be set after GPS power on success, or will return error. 2. Typically, user should wait about 2 seconds after GPS power on success. |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <pmtk> | PMTK command string. No "\$" before the PMTK string. Valid PMTK command string: " PMTK353,1,0,0,0,0*2A" or " PMTK353,1,0,0,0,0"(PMTK command can omit '*' and check sum) |

Example:

| Commands | Response |
|---|-----------|
| AT+MGPSS=" PMTK000*32" | OK |
| AT+MGPSS=" PMTK353,1,0,0,0,0*2A" | OK |
| AT+MGPSS=" PMTK353,1,0,0,0,0" | OK |

14.4 AT+MGPSEPO Set EPO Parameter

Enable/Disable EPO downloading and aiding features. Set the data account used by EPO downloading.

| | |
|----------------------------------|--|
| Test Command | Response |
| AT+MGPSEPO=? | +MGPSEPO: (0-1) OK |
| Read Command | Response |
| AT+MGPSEPO? | +MGPSEPO: <status> OK |
| Write Command | Response |
| AT+MGPSEPO=<status> | OK +CME ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <status> | 1 Enable EPO download and EPO aid <u>0</u> Disable EPO download and EPO aid |

14.5 AT+MGPSTS Set GPS Time Sync Parameter

Enable/Disable GPS time sync and aiding. Set time sync network data account.

| | |
|---------------------------------|---|
| Test Command | Response |
| AT+MGPSTS=? | +MGPSTS: (0-1) OK |
| Read Command | Response |
| AT+MGPSTS? | +MGPSTS: <status> OK |
| Write Command | Response |
| AT+MGPSTS=<status> | OK +CME ERROR: <err> |
| Reference | Note Precondition for using time sync feature: First, set property data account which will be used by time sync. AT+EGDCONT=1,"IP","cmnet" |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <status> | 1 Enable time sync and time aid <u>0</u> Disable time sync and time aid |

14.6 AT+MGPSPPS Set PPS output

This command is used to set PPS output.

| | |
|---|--|
| Test Command | Response |
| AT+MGPSPPS=? | +MGPSPPS: (0-1),(10-900) OK |
| Read Command | Response |
| AT+MGPSPPS? | +MGPSPPS: <state>,<cycle> OK |
| Write Command | Response |
| AT+MGPSPPS=<state>[,<cycle>] | OK Or ERROR |
| Reference | Note |
| | In the initial state of PPS, default PPS output is off; Only set AT+MGPSPPS=1 ,the PPS output will open. The second parameter sets the time period, and the range is between 10 and 900. |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <state> | <u>0</u> close PPS output 1 open PPS output |
| <cycle> | Set the time cycle of the pulse, The default value is 50ms. |

For L216 module, PPS pin number and name are defined below:

| Module | PPS PIN number | PPS PIN name |
|-------------|----------------|------------------|
| L216 | 22 | GPIO_MB_2 |

Note:

We only support this feature for L216 module until now.

14.7 AT+MGPSIPR Specifies the GNSS uart port data rate

This command is used to specifies the GNSS uart ports data rate.

| | |
|--------------------------------|---|
| Test Command | Response |
| AT+MGPSIPR=? | +MGPSIPR: 9600,14400,19200,38400,57600,115200 OK |
| Read Command | Response |
| AT+MGPSIPR? | +MGPSIPR: <rate> OK |
| Write Command | Response |
| AT+MGPSIPR=<rate> | OK Or ERROR |
| Reference | Note |
| | Have effect only when GPS is power on |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <rate> | The rate, in bits per second. Currently, the following rates are supported: <u>9600,14400,19200,38400,57600,115200</u> |

14.8 AT+GETGPS Read GNSS information

Read GNSS data and control GNSS data automatically printed on the serial port 1

| | |
|---|--|
| Execution Command AT+GETGPS | Response Current GNSS information OK |
| Read Command AT+GETGPS? | Response +GETGPS=<type>,<mode> OK |
| Write Command AT+GETGPS=<type>[,<mode>] | Response Current GNSS information OK Or ERROR |
| Reference | Note Set data types and mode will be written to NV |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <type> | Support query data type: GNGGA、GPGSA、GLGSA、GPGSV、GLGSV、GNRMC、GNVTG、GPACCURACY、BDGGA、GPGGA、ALL |
| <mode> | <u>0</u> open GNSS data automatically output; default 0. 1close GNSS data automatically output |
| Reference | Note When mode is not set, it will be set to 1 |

Example:

| Commands | Response |
|----------|----------|
|----------|----------|

| | |
|--------------------------|---|
| AT+MGPSC=1 | // Power on GPS OK |
| AT+GETGPS="GNRMC" | \$GNRMC,112027.000,A,3109.8688,N,12123.4588,E,0.00,175.36,090916,,A*71 OK |
| AT+GETGPS="ALL" | \$GNGGA,112030.000,3109.8688,N,12123.4588,E,1,4,2.33,25.2,M,8.0,M,,*4F \$GPGSA,A,3,193,24,05,29,,,,,,,,,2.52,2.33,0.95*3A \$GLGSA,A,3,,,,,,,,,,2.52,2.33,0.95*15 \$GPGSV,2,1,06,193,72,085,33,24,38,176,33,05,37,082,29,29,22,230,30*4B \$GPGSV,2,2,06,02,12,150,,30,01,035,*7E \$GLGSV,1,1,00*65 \$GNRMC,112030.000,A,3109.8688,N,12123.4588,E,0.00,175.36,090916,,A*77 \$GNVTG,175.36,T,M,0.00,N,0.00,K,A*25 \$GPACCURACY,12.0*3B OK |

14.9 AT+MGPSTIME Send Time Aiding to GNSS

This command is used to send time aiding to GNSS. If GNSS part is turned on already, it's time will adjust accordingly. At the same time ,module's system time will also adjust.

| | |
|--|--|
| Test Command | Response |
| AT+MGPSTIME=? | +MGPSTIME: (0-2049),(1-12),(1-31),(0-23),(0-59),(0-60) OK |
| Write Command | Response |
| AT+ MGPSTIME =<year>, <month>,<day>,<hour>, <min>,<seconds> | OK Or ERROR |
| Reference | Note module's system time will also adjust.(Use "AT+CCLK? " to check) |

Parameters are defined below:

| Parameters | Description |
|------------------------|-------------|
| <year> | year |
| <month> | month |
| <day> | day |
| <hour> | hour |
| <min> | minutes |
| <seconds> | seconds |

14.10 AT+MGPSLOC Auto Send Location Aiding to GNSS

If GNSS is turned on, this command will auto send location aiding PMTK command to GNSS.

| | |
|---|---|
| Test Command | Response |
| AT+MGPSLOC=? | +MGPSLOC: (0-1),(0-120) OK |
| Read Command | Response |
| AT+MGPSLOC? | +MGPSLOC: <mode>,<time> OK |
| Write Command | Response |
| AT+MGPSLOC=<mode>,<time> | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 Turn off auto send location function 1 Turn on auto send location function |
| <time> | 0-10-120 Location information valid time duration, which will counter after location data received from the "AT+GTPOS" unit: minute |

14.11 AT+MGPSTATUS Get The Status Of AGPS Information

Get the inject status of AGPS information, including: time synchronize, EPO synchronize and location synchronize indication.

| | |
|-----------------------|--|
| Test Command | Response |
| AT+MGPSTATUS=? | OK |
| Read Command | Response |
| AT+MGPSTATUS? | +MGPSTATUS: <time_sync_s>,< epo_sync_s>,<loc_sync_s> OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------------|---|
| <time_sync_s> | <u>0</u> The time information is not injected into GPS. 1The time information is injected into GPS |
| <epo_sync_s> | <u>0</u> The EPO information is not injected into GPS. 1The EPO information is injected into GPS |
| <loc_sync_s> | <u>0</u> The location information is not injected into GPS. 1The location information is injected into GPS |

14.12 AT+MGPSURC AGPS Information URC control

AGPS related URC Information control, including: time synchronize, EPO synchronize and location synchronize indication.

| | |
|---|---|
| Test Command | Response |
| AT+MGPSURC=? | +MGPSURC: (0-1),(0-1),(0-1) OK |
| Read Command | Response |
| AT+MGPSURC? | +MGPSURC: <time_sync >,< epo_sync > , <loc_sync > OK |
| Write Command | Response |
| AT+MGPSURC=<time_syn c>,<epo_sync>,<loc_sync > | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------------|---|
| <time_sync> | 0Disable time synchronize URC indication <u>1</u> Enable time synchronize URC indication |
| <epo_sync> | 0Disable EPO synchronize URC indication <u>1</u> Enable EPO synchronize URC indication |
| <loc_sync> | 0Disable location synchronize URC indication <u>1</u> Enable location synchronize URC indication |

15 GPS AT commands for L218

Overview of GPS AT Commands for L218:

| AT Command | Description |
|----------------------|-----------------------------------|
| AT+CUSGPSC | Power on/off GPS |
| AT+CUSGPSS | Send PMTK Command |
| AT+CUSGPSEPO | Set EPO Parameter |
| AT+CUSGPSTS | Set GPS Time Sync Parameter |
| AT+CUSGPSTIME | Send Time Aiding to GNSS |
| AT+CUSGPSLOC | Auto Send Location Aiding to GNSS |

Note:

1. The support of these commands depend on firmware version.
2. Only L218 support these commands. L216 (E) don't support these commands'.

15.1 AT+CUSGPSC Power on/off GPS

Control GPS state -- power on/off GPS receiver.

| | |
|---------------------------------|---|
| Test Command | Response |
| AT+CUSGPSC=? | +CUSGPSC: (0-1) OK |
| Read Command | Response |
| AT+CUSGPSC? | +CUSGPSC: <state> OK |
| Write Command | Response |
| AT+CUSGPSC=<state> | OK +CME ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <state> | <u>0</u> power off GPS 1 power on GPS |

Example:

| Commands | Response |
|---------------------|-------------------------------|
| AT+CUSGPSC=1 | // Power on GPS OK |
| AT+CUSGPSC=0 | // Power off GPS OK |

15.2 AT+CUSGPSS Send PMTK Command

Send MTK private GPS command – PMTK command to GPS chip.

| | |
|--------------------------------|---|
| Test Command | Response |
| AT+CUSGPSS=? | OK |
| Write Command | Response |
| AT+CUSGPSS=<pmtk> | OK |
| | +CME ERROR: <err> |
| Reference | Note This Command can be set after GPS power on success, or will return error. |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <pmtk> | PMTK command string. No "\$" before the PMTK string. Valid PMTK command string: " PMTK353,1,0,0,0,0*2A" |

Example:

| Commands | Response |
|---|-----------|
| AT+CUSGPSS="PMTK000*32" | OK |
| AT+CUSGPSS=" PMTK353,1,0,0,0,0*2A" | OK |
| AT+CUSGPSS=" PMTK353,1,0,0,0,0" | OK |

15.3 AT+CUSGPSEPO Set EPO Parameter

Enable/Disable EPO downloading and aiding features. Set the data account used by EPO downloading.

| | |
|-------------------------------------|--|
| Test Command | Response |
| AT+CUSGPSEPO=? | +CUSGPSEPO: (0-1) OK |
| Read Command | Response |
| AT+CUSGPSEPO? | +CUSGPSEPO: <status> OK |
| Write Command | Response |
| AT+CUSGPSEPO=< status> | OK +CME ERROR: <err> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <status> | 1 Enable EPO download and EPO aid <u>0</u> Disable EPO download and EPO aid |

15.4 AT+CUSGPSTS Set GPS Time Sync Parameter

Enable/Disable GPS time sync and aiding. Set time sync network data account.

| | |
|--|---|
| Test Command | Response |
| AT+CUSGPSTS=? | +CUSGPSTS: (0-1),(0-2) OK |
| Read Command | Response |
| AT+CUSGPSTS? | +CUSGPSTS: <status>,<data account> OK |
| Write Command | Response |
| AT+CUSGPSTS=<status>,<data account> | OK +CME ERROR: <err> |
| Reference | Note Precondition for using time sync feature: First, set property data account which will be used by time sync. AT+EGDCONT=1,"IP","cmnet" |

Parameters are defined below:

| Parameters | Description |
|-----------------------------|---|
| <status> | 1 Enable time sync and time aid 0 Disable time sync and time aid |
| <data account> | No use, please set to 0 |

15.5 AT+CUSGPSTIME Send Time Aiding to GNSS

This command is used to send time aiding to GNSS. If GNSS part is turned on already, it's time will adjust accordingly. At the same time ,module's system time will also adjust.

| | |
|---|--|
| Test Command | Response |
| AT+CUSGPSTIME=? | +CUSGPSTIME: (0-2049),(1-12),(1-31),(0-23),(0-59),(0-60) OK |
| Write Command | Response |
| AT+CUSGPSTIME=<year> ,<month>,<day>,<hour>,<min>,<seconds> | OK Or ERROR |
| Reference | Note module's system time will also adjust.(Use "AT+CCLK? " to check) |

Parameters are defined below:

| Parameters | Description |
|------------------------|-------------|
| <year> | year |
| <month> | month |
| <day> | day |
| <hour> | hour |
| <min> | minutes |
| <seconds> | seconds |

15.6 AT+CUSGPSLOC Auto Send Location Aiding to GNSS

If GNSS is turned on, this command will auto send location aiding PMTK command to GNSS.

| | |
|---|--|
| Test Command | Response |
| AT+CUSGPSLOC=? | +CUSGPSLOC: (0-1),(0-120) |
| | OK |
| Read Command | Response |
| AT+CUSGPSLOC? | +CUSGPSLOC: <mode>,<time> |
| | OK |
| Write Command | Response |
| AT+CUSGPSLOC=<mode>,<time> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 Turn off auto send location function 1 Turn on auto send location function |
| <time> | 0-10-120 Location information valid time duration, which will counter after location data received from the "AT+GTPOS" unit: minute |

16 TCPIP AT commands

Overview of TCPIP AT Commands:

| AT Command | Description |
|---------------------|---|
| AT+CIPMUX | Start up multi-IP connection |
| AT+CIPMODE | Select TCPIP Application Mode |
| 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+CIPSTART | Start up TCP or UDP connection |
| AT+CIPSEND | Send data through TCP or UDP connection |
| AT+CIPCLOSE | Close TCP or UDP connection |
| AT+CIPSHUT | Deactivate GPRS PDP context |
| AT+CIPSTATUS | Query current connection status |
| AT+CIPRXGET | Get data from network manually |
| AT+CIPHEAD | Add an IP Head at the Beginning of a Package Received |
| AT+CIPQSEND | Select Data Transmitting Mode(no action) |
| AT+CDNSGIP | Get IP address by Domain Name |
| AT+CIPTKA | Set TCP Keep-alive Parameters |
| AT+CIPACK | TCP/IP Data flow calculation |
| AT+CIPCCFG | Configuration of TCP/IP Transparent mode |

Note: The support of these commands depend on firmware version.

16.1 AT+CIPMUX Start Up Multiple IP Connection

This command is used to start Up Multiple IP Connection or single IP Connection.

| | |
|-----------------------------------|--|
| Test Command | Response |
| AT+CIPMUX=? | +CIPMUX:(0,1) OK |
| Read Command | Response |
| AT+ CIPMUX? | + CIPMUX: <multiple> OK Or Error |
| Write Command | Response |
| AT+CIPMUX=<multiple> | OK Or ERROR |
| Reference | Note Only in IP initial state, AT+CIPMUX=1 is effective; Only when multi IP connection and GPRS application are both shut down, AT+CIPMUX=0 is effective. |

Parameters are defined below:

| Parameters | Description |
|-------------------------|---|
| <multiple> | <u>0</u> Single IP connection 1 Multiple IP connection |

16.2 AT+CIPMODE Select TCPIP Application Mode

This command is used to Select TCPIP Application Mode

| | |
|--------------------------------|--|
| Test Command | Response |
| AT+CIPMODE=? | +CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE) OK |
| Read Command | Response |
| AT+ CIPMODE? | + CIPMODE:<mode> OK |
| Write Command | Response |
| AT+CIPMODE=<mode> | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | <u>0</u> Normal Mode 1 Transparent Mode |

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

This command is used to Start Task and Set APN, USER NAME, PASSWORD.

| | |
|---|--|
| Test Command | Response |
| AT+CSTT=? | +CSTT:"APN","USER","PWD" OK |
| Read Command | Response |
| AT+CSTT? | +CSTT: <APN>,<user name>,<password> OK |
| Write Command | Response |
| AT+CSTT=<APN>,<user name>,<password> | OK Or ERROR |
| Execution Command | Response |
| AT+CSTT | OK Or ERROR |
| Reference | Note 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. |

Parameters are defined below:

| Parameters | Description |
|--------------------------|--|
| <APN> | A string parameter which indicates the GPRS access point name,99 is the MAX length |
| <user name> | A string parameter which indicates the GPRS user name, MAX length is 31 . |
| <password> | A string parameter which indicates the GPRS password, MAX length is 31 . |

16.4 AT+CIICR Bring Up Wireless Connection with GPRS or CSD

This command is used to Bring Up Wireless Connection with GPRS or CSD..

| | |
|--------------------------------------|--|
| Test Command | Response |
| AT+CIICR=? | OK |
| Execution Command AT+CIICR | Response <ip address> OK Or ERROR |
| Reference | Note 1. Max Response Time 150 seconds 2. 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. 3. 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. |

| Parameters | Description |
|----------------------------|-------------|
| < ip address> | ip address |

16.5 AT+CIFSR Get local IP address

This command is used to get local IP address..

| | |
|-------------------|---|
| Test Command | Response |
| AT+CIFSR=? | OK |
| Execution Command | Response |
| AT+CIFSR | <IP address> OK Or ERROR |
| Reference | Note local IP Address can be obtained by AT+CIFSR, if module hasn't valid IP, it will respond ERROR. |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---|
| <IP address> | A string parameter which indicates the IP address assigned, for example: 10.112.208.9 |

16.6 AT+CIPSTART Start TCP or UDP Connection

This command is used to start TCP or UDP Connection.

| Test Command | Response |
|--|---|
| AT+CIPSTART=? | <p>1) If AT+CIPMUX=0</p> <p>+CIPSTART:("TCP","UDP"),(0-255).(0-255).(0-255).(0-255)",(1-65535) +CIPSTART:("TCP","UDP"),"DOMAINNAME",(1-65535)</p> <p>OK</p> <p>2) If AT+CIPMUX=1</p> <p>+CIPSTART:(0-5),("TCP","UDP"),(0-255).(0-255).(0-255).(0-255)",(1-65535)" +CIPSTART:(0-5),("TCP","UDP"),"DOMAINNAME",(1-65535)"</p> <p>OK</p> |
| Write Command | Response |
| <p>1)If single IP connection (AT+CIPMUX=0) AT+CIPSTART=<mode>,<IP address or domain name>,<port></p> | <p>OK [<id>,) CONNECT OK</p> <p>Or</p> |
| <p>2)If multi-IP connection (AT+CIPMUX=1) AT+CIPSTART=<id>,<mode>,< IP address or domain name>,<port></p> | <p>[<id>,) CONNECT FAIL (including id >5 error)</p> <p>If already connected, will return:</p> <p>OK [<id>,)ALREADY CONNECT</p> |

| | |
|-----------|--|
| Reference | <p>Note</p> <p>Max Response Time 90 seconds</p> <p>This command allows establishment of a TCP/UDP connection only when the state is IP INITIAL or IP STATUS when it is in single state.</p> <p>In multi-IP state, the state is in IP STATUS only. So it is necessary to process "AT+CIPSHUT" before user establishes a TCP/UDP connection with this command when the state is not IP INITIAL or IP STATUS.</p> <p>When module is in multi-IP state, before this command is executed, it is necessary to process "AT+CSTT, AT+CIICR, AT+CIFSR".</p> |
|-----------|--|

Parameters are defined below:

| Parameters | Description |
|--|--|
| <id> | 0..5 A numeric parameter which indicates the connection number -1 illegal id. |
| <mode> | A string parameter which indicates the connection type "TCP" Establish a TCP connection "UDP" Establish a UDP connection |
| <IP address or domain name> | A string parameter which indicates remote server IP address, or domain name. |
| <port> | Remote server port |

16.7 AT+CIPSEND Send data through TCP or UDP connection

This command is used to send data through TCP or UDP connection.

| Test Command | Response |
|---------------------|--|
| AT+CIPSEND=? | 1) For single IP connection (+CIPMUX=0) +CIPSEND: (1-1460) OK 2) For multi IP connection (+CIPMUX=1) +CIPSEND: (0-5),(1-1460) OK |
| Read Command | Response |
| AT+CIPSEND? | 1) For single IP connection (+CIPMUX=0) +CIPSEND: <size> OK 2) For multi IP connection (+CIPMUX=1) +CIPSEND: <id>,<size> OK |

| Write Command | Response |
|---|---|
| <p>1) If single IP connection (AT+CIPMUX=0) AT+CIPSEND=<length></p> <p>2) If multi IP connection (AT+CIPMUX=1) AT+CIPSEND=<id>,<length></p> | <p>If single IP is connected (+CIPMUX=0) If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: +CME ERROR <err></p> <p>If sending is successful: When +CIPQSEND=0 SEND OK</p> <p>When +CIPQSEND=1 DATA ACCEPT: <id>,<length></p> <p>If sending fails: SEND FAIL</p> <p>If multi IP connection is established (+CIPMUX=1) If connection is not established or module is disconnected: If error is related to ME functionality: +CME ERROR <err></p> <p>If sending is successful: <id>,SEND OK</p> <p>If sending fails: <id>,SEND FAIL</p> |

| | |
|---|--|
| <p>Execution Command</p> <p>AT+CIPSEND response">", then type data for send, tap CTRL+Z to send</p> | <p>Response</p> <p>This Command is used to send changeable length data.</p> <p>If single IP connection is established (+CIPMUX=0)</p> <p>If connection is not established or module is disconnected:</p> <p>If error is related to ME functionality: +CME ERROR <err></p> <p>If sending is successful: SEND OK</p> <p>If sending fails: SEND FAIL</p> |
| <p>Reference</p> | <p>Note</p> <p>Max Response Time 85 seconds</p> <p>This Command can only be used in single IP connection mode (+CIPMUX=0) and to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol.</p> <p>There are at most <size> bytes which can be sent at a time.</p> |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <id> | 0-5 A numeric parameter which indicates the connection number |
| <size> | 1-1460 A numeric parameter which indicates the data length sent one time |

16.8 AT+CIPCLOSE Close TCP or UDP connection

This command is used to Close TCP or UDP Connection.

| | |
|---|---|
| Test Command | Response |
| AT+CIPCLOSE=? | 1) For single IP connection (+CIPMUX=0) OK 2) For multi IP connection (+CIPMUX=1) +CIPCLOSE: (0-5) OK |
| Write Command | Response |
| If multi-IP connection (AT +CIPMUX=1) AT+CIPCLOSE=<id> | For multi IP connection (+CIPMUX=1) <id>, CLOSE OK |
| Execution Command | Response |
| AT+CIPCLOSE | For single IP connection only (+CIPMUX=0): If close is successfully: CLOSE OK If close fails: ERROR |
| Reference | Note Max Response Time 75 seconds This command only closes connection at the status of TCP/UDP which returns CONNECTING or CONNECT OK , otherwise it will return ERROR , after the connection is closed, the status is IP CLOSE in single IP mode. |

Parameters are defined below:

| Parameters | Description |
|-------------------|---|
| <id> | 0-5 A numeric parameter which indicates the connection number |

16.9 AT+CIPSHUT Deactivate GPRS PDP Context

This command is used to deactivate GPRS PDP Context

| | |
|---------------------|--|
| Test Command | Response |
| AT+CIPSHUT=? | OK |
| Execution Command | Response |
| AT+CIPSHUT | <p>If close is successful: SHUT OK</p> <p>If close fails: ERROR</p> <p>Or</p> |
| Reference | <p>Note</p> <p>Max response time is 75 seconds</p> <p>If this command is executed in multi-connection mode, all of the IP connection will be shut.</p> <p>User can close GPRS PDP context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.</p> <p>If "+PDP: DEACT" URC is reported which means the GPRS is released by the network, then user still needs to execute "AT+CIPSHUT" command to make PDP context come back to original state.</p> |

16.10 AT+CIPSTATUS Query Current Connection Status

This command is used to Query Current Connection Status.

| | |
|--|---|
| Test Command | Response |
| AT+CIPSTATUS=? | OK Or +CIPSTATUS:(0-5) OK |
| Write Command | Response |
| If multi IP connection mode (AT+CIPMUX=1) | +CIPSTATUS: <id>,<bearer>, <TCP/UDP>, <IP address>, <port>,<client state> |
| AT+CIPSTATUS=<id> | OK |
| Execution Command | Response |
| AT+CIPSTATUS | 1) If in single-IP mode (AT+CIPMUX=0) OK STATE:< state> 2) If in multi-IP mode (AT+CIPMUX=1) OK STATE:<state> C: 0,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state> ... C: 5,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state> |
| Reference | Note |

Parameters are defined below:

| Parameters | Description | | | | | | | | | | | | | | |
|-----------------------------|--|-------------------|-----------------------------|------------------|--------------------|-----------------------|-------------------------------|-------------------|------------------------------|------------------|-----------------|------------------|-----------------|---------------|---|
| <id> | 0-5 A numeric parameter which indicates the connection number | | | | | | | | | | | | | | |
| <bearer> | 0-1 GPRS bearer, default is 0 | | | | | | | | | | | | | | |
| <state> | <p>A string parameter which indicates the progress of connecting</p> <p>In single-IP state:</p> <p>IP INITIAL IP START IP CONFIG IP GPRSACT IP STATUS TCP CONNECTING/UDP CONNECTING CONNECT OK TCP CLOSING/UDP CLOSING TCP CLOSE/UDP CLOSE PDP DEACT</p> <p>In Multi-IP state:</p> <p>IP INITIAL IP START IP CONFIG IP GPRSACT IP STATUS IP PROCESSING PDP DEACT</p> | | | | | | | | | | | | | | |
| <client state> | <table> <tr> <td>IP INITIAL</td><td>pdp stack on initial status</td></tr> <tr> <td>IP STATUS</td><td>pdp stack is ready</td></tr> <tr> <td>TCP CONNECTING</td><td>tcp link on connecting status</td></tr> <tr> <td>CONNECT OK</td><td>tcp or udp link is connected</td></tr> <tr> <td>TCP CLOSE</td><td>tcp link closed</td></tr> <tr> <td>UDP CLOSE</td><td>udp link closed</td></tr> <tr> <td>CLOSED</td><td>tcp server or udp server close the link</td></tr> </table> | IP INITIAL | pdp stack on initial status | IP STATUS | pdp stack is ready | TCP CONNECTING | tcp link on connecting status | CONNECT OK | tcp or udp link is connected | TCP CLOSE | tcp link closed | UDP CLOSE | udp link closed | CLOSED | tcp server or udp server close the link |
| IP INITIAL | pdp stack on initial status | | | | | | | | | | | | | | |
| IP STATUS | pdp stack is ready | | | | | | | | | | | | | | |
| TCP CONNECTING | tcp link on connecting status | | | | | | | | | | | | | | |
| CONNECT OK | tcp or udp link is connected | | | | | | | | | | | | | | |
| TCP CLOSE | tcp link closed | | | | | | | | | | | | | | |
| UDP CLOSE | udp link closed | | | | | | | | | | | | | | |
| CLOSED | tcp server or udp server close the link | | | | | | | | | | | | | | |

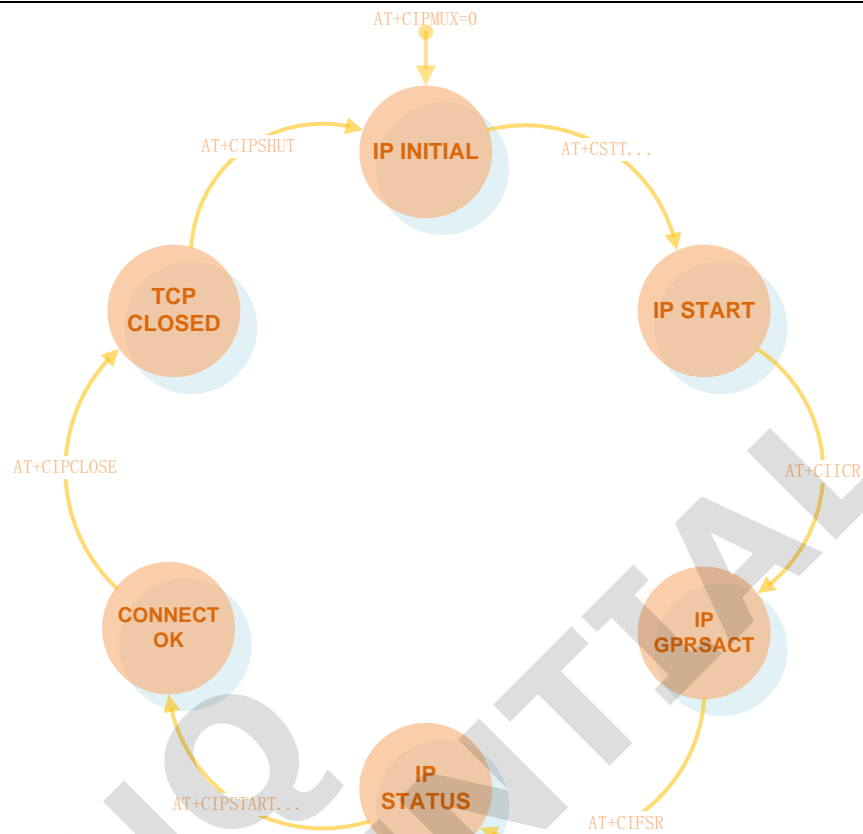


Figure 16-1 Single-IP state

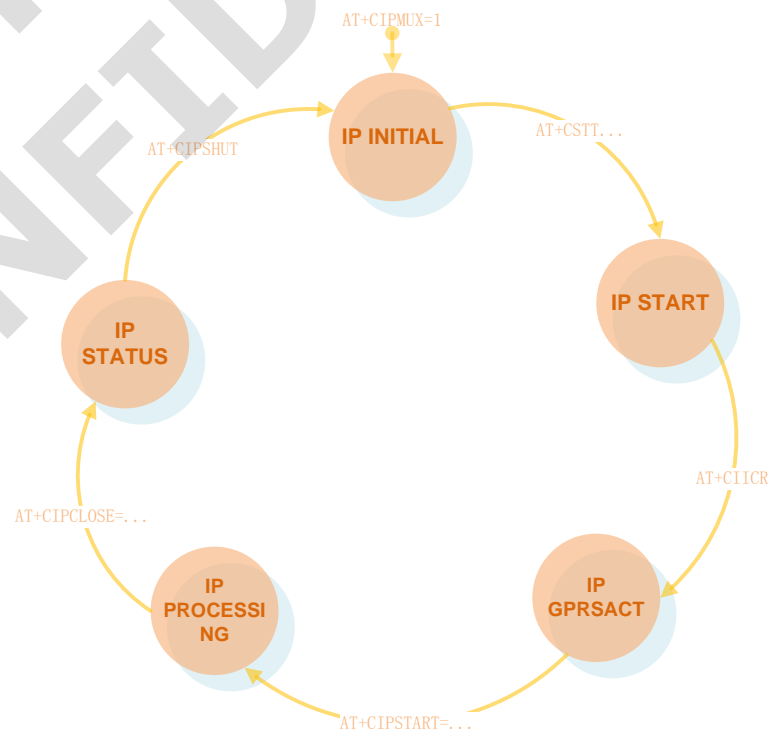


Figure 16-2 Multi-IP state

16.11 AT+CIPRXGET Get Data from Network Manually

This command is used to Get Data from Network Manually.

| Test Command | Response |
|----------------------|--|
| AT+CIPRXGET=? | If single IP connection (+CIPMUX=0) +CIPRXGET: (list of supported <mode>s), (list of supported <REQ length>) OK If multi IP connection (+CIPMUX=1) +CIPRXGET: (list of supported <mode>s), (list of supported <id>s), (list of supported <REQ length>) OK |
| Read Command | Response |
| AT+CIPRXGET? | +CIPRXGET: <mode> OK |

| Write Command | Response |
|--|---|
| 1) If single IP connection (+CIPMUX=0) AT+CIPRXGET=<mode>[,<REQ length >] | OK Or ERROR |
| 2) If multi IP connection (+CIPMUX=1) AT+CIPRXGET=<mode>[,<id>,<REQ length >] | 1)For single IP connection If “AT+CIPSRIP=1” is set, IP address and port are contained. if <mode>=1 OK if <mode>=2 +CIPRXGET: <id>,<REQ length>,<CNF length>[,<IP ADDRESS>:<PORT>] 1234567890... OK if <mode>=3 +CIPRXGET:<id>,<REQ length>,<CNF length>[,<IP ADDRESS>:<PORT>] 5151... OK 2)For multi IP connection if <mode>=1 OK if <mode>=2 +CIPRXGET: <id>,<REQ length>,<CNF length>[,<IP ADDRESS>:<PORT>] 1234567890... OK if <mode>=3 +CIPRXGET:<id>,<REQ length>,<CNF length>[,<IP ADDRESS>:<PORT>] 5151... OK If error is related to ME functionality: +CME ERROR: <err> |
| Reference | Note To enable this function, parameter <mode> must be set to 1 before connection. |

Parameters are defined below:

| Parameters | Description |
|---------------------------|--|
| <mode> | <u>0</u> Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly. 1 Enable getting data from network manually. 2 The module can get data, but the length of output data can't exceed 1460 bytes at a time. 3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time. 4 Reserved |
| <id> | A numeric parameter which indicates the connection number |
| <REQ length> | Requested number of data bytes (1-1460 bytes) to be read |
| <CNF length> | Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read. |

Example:

| Commands | Response |
|---------------------|---|
| AT+CIPRXGET? | If no data received: +CIPRXGET:0 OK |

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

This command is used to add an IP Head at the Beginning of a Package Received.

| | |
|--------------------------------|---|
| Test Command | Response |
| AT+CIPHEAD=? | +CIPHEAD: (0-NO HEADER,1-ADD HEADER) OK |
| Read Command | Response |
| AT+CIPHEAD? | + CIPHEAD: <mode> OK Or Error |
| Write Command | Response |
| AT+CIPHEAD=<mode> | OK Or ERROR |
| Reference | Note Only have effect for Single IP connection(AT+CIPMUX=0) |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | <u>0</u> Normal mode, Not add IP header 1 Enable add IP header function |

16.13 AT+CIPQSEND Select Data Transmitting Mode

This command is used to select Data Transmitting Mode.

| | |
|------------------------------|---|
| Test Command | Response |
| AT+CIPQSEND=? | +CIPQSEND: (0-1) OK |
| Read Command | Response |
| AT+CIPQSEND? | + CIPQSEND: <n> OK Or Error |
| Write Command | Response |
| AT+CIPQSEND=<n> | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | <u>0</u> Normal mode, 1 quick mode. |

16.14 AT+CDNSGIP Get IP address by Domain Name

This command is used to get IP address by Domain Name.

| | |
|---------------------------------------|---|
| Test Command | Response |
| AT+CDNSGIP=? | OK |
| Write Command | Response |
| AT+CDNSGIP=<domain name> | OK |
| | +CDNSGIP: <result>,<domain name>[,<IP addr>] |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------|--|
| result | 0 get ip address failure 1 get ip address successful |
| domain name | Domain name string, need use "" double quotes. If the value is 10, this represents get ip address failure also. |
| IP addr | IP address string, need use "" double quotes |

Example:

| | |
|-------------------------------|--|
| Commands | Response |
| AT+CDNSGIP="baidu.com" | OK |
| | +CDNSGIP: 1,"baidu.com","111.13.100.91" |

16.15 AT+CIPTKA Set TCP Keep-alive Parameters

This command is used to Set TCP Keep-alive Parameters

| | |
|---|--|
| Read Command | Response |
| AT+CIPTKA=? | +CIPTKA: (0-1),(30-7200),(30-600),(1-9) OK |
| Read Command | Response |
| AT+CIPTKA? | +CIPTKA:<mode>,<keepIdle>,<keepInterval>,<keepCount> OK |
| Write Command | Response |
| AT+CIPTKA=<mode>[,<keepIdle>[,<keepInterval>[,<keepCount>]]] | OK/ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| mode | Set TCP keep-alive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism |
| keepIdle | Interval type; Idle (in second) before TCP send the initial keep-alive probe. 30-7200 If no set,default 180 |
| keepInterval | Interval type; (in second) between keep-alive probes retransmission. 30-600 If no set,default 75 |
| keepCount | Interval type, Invalid value. 1-9 If no set,default 9 |

Example:

| | |
|-----------------------------|-----------|
| Commands | Response |
| AT+CIPTKA=1,180,60,6 | OK |

16.16 AT+CIPACK TCP/IP Data flow calculation

This command is used to calculate TCP/IP data flow status.

| | |
|--|---|
| Test Command | Response |
| AT+CIPACK=? | OK |
| Write Command | Response |
| (+CIPMUX=1) AT+CIPACK=<id> | +CIPACK: <txlen>,<acklen>,<nacklen> OK |
| | Or |
| | ERROR |
| Active Command | Response |
| (+CIPMUX=0) AT+CIPACK | +CIPACK: <txlen>,<acklen>,<nacklen> OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------|--|
| id | 0..5 A numeric parameter which indicates the connection number |
| txlen | The data amount which has been sent(MAX: $2^{32}-1$) |
| acklen | The data amount confirmed successfully by the server(MAX: $2^{32}-1$) |
| nacklen | The data amount without confirmation by the server(MAX: $2^{32}-1$) |

Example:

| Commands | Response |
|--------------------|--|
| AT+CIPACK | OK +CIPACK: 12,12,0 |
| AT+CIPACK=0 | OK +CIPACK: 12,12,0 |

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16.17 AT+CIPCCFG Configuration of TCP/IP Transparent mode

This command is used to configure transparent mode of TCP/IP connection .

| | |
|---|---|
| Test Command | Response |
| AT+CIPCCFG=? | +CIPCCFG: (0-8),(2-10),(256-1460),(0,1) OK |
| Read Command | Response |
| AT+CIPCCFG? | +CIPCCFG: <retry>,<wait>,<size>,<esc> OK Or ERROR |
| Write Command | Response |
| AT+CIPCCFG=<retry>,<wait>,<size>,<esc> | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <retry> | <u>0</u> -8 Number of retries to be made for an IP packet. 0 default. |
| <wait> | <u>2</u> -10 Number of 100ms intervals to wait for serial input before sending the packet. 2 default. |
| <size> | 256-1460 Size in bytes of data block to be received from serial port before sending. (default: <u>1024</u>) |
| <esc> | 0- <u>1</u> Whether turn on the escape sequence, default is TRUE. |

Example:

| Commands | Response |
|------------------------------|-----------|
| AT+CIPCCFG=0,2,1024,0 | OK |

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17 Proprietary AT commands

Overview of proprietary AT Commands:

| AT Command | Description |
|-------------------|--|
| AT+CALM | Alert sound mode |
| AT+GSN | Request TA Serial Number Identification (IMEI) |
| AT+SPEAKER | Speaker and MIC select |
| AT+SIDET | Change the side tone gain level |
| AT+CENG | Configure Engineering Mode |
| AT+DDET | DTMF detection |
| AT+CSDT | Switch On or Off Detecting SIM Card |
| AT+CPOWD | Power control |

Note: The support of these commands depend on firmware version.

17.1 AT+CALM Alert sound mode

This command is used to set alert sound mode.

| | |
|------------------|--|
| Test Command | Response |
| AT+CALM=? | +CALM: (0-1) OK |
| Read Command | Response |
| AT+CALM? | + CALM: <mode> OK Or Error |

| | |
|-----------------------------|--------------|
| Write Command | Response |
| AT+CALM=<mode> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | <u>0</u> Normal mode 1 Silent mode (all sounds from ME are prevented) |

Example:

| | |
|------------------|---------------------|
| Commands | Response |
| AT+CALM=? | +CALM: (0-1) |
| | OK |
| AT+CALM? | +CALM: 1 |
| | OK |

17.2 AT+GSN Request TA Serial Number Identification (IMEI)

This command is used to request TA Serial Number Identification (IMEI).

| | |
|-----------------|-----------|
| Test Command | Response |
| AT+GSN=? | OK |

| | |
|-------------------|--|
| Execution Command | Response |
| AT+GSN | <IMEI> OK Or Error |
| Reference | Note |

17.3 AT+SPEAKER Speaker and MIC select

This command is used to select speaker and MIC.

| | |
|---|--|
| Test Command | Response |
| AT+SPEAKER=? | +SPEAKER: (0-1),(0-1) OK |
| Read Command | Response |
| AT+SPEAKER? | + SPEAKER: <speaker channel>,<MIC channel> OK Or Error |
| Write Command | Response |
| AT+SPEAKER=<speaker channel>,<MIC channel> | OK Or ERROR |

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

Parameters are defined below:

| Parameters | Description |
|--------------------------------|---|
| <speaker channel> | <u>0</u> speaker channel 0 1 speaker channel 1 |
| <MIC channel> | <u>0</u> MIC channel 0 1 MIC channel 1 |

17.4 AT+SIDET Change the side tone gain level

This command is used to change the side tone gain level.

| | |
|--|--|
| Test Command | Response |
| AT+SIDET=? | +SIDET: (0-1),(0-16) OK |
| Read Command | Response |
| AT+SIDET? | + SIDET: <channel 0 level>,<channel 1 level> OK Or Error |
| Write Command | Response |
| AT+SIDET=<channel number>,<channel n level> | OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------------------|--|
| <channel number> | <u>0</u> channel number 0 1 channel number 1 |
| <channel n level> | <u>0</u> -16 channel level (n refer to <channel number>) |

Example:

| Commands | Response |
|----------------------|--|
| AT+SIDET=? | +SIDET: (0-1),(0-16) OK |
| AT+SIDET=1,11 | OK |

17.5 AT+CENG Configure Engineering Mode

This Command is used to Configure Engineering Mode.

| Test Command | Response |
|------------------|--|
| AT+CENG=? | +CENG: (0-3),(0-1) OK |

| | |
|---|---|
| Read Command | Response |
| AT+CENG? | <p>Engineering Mode is designed to view the network information</p> <p>When <mode>=1 or <mode>=2. <cell> carry with them corresponding network interaction.</p> <p>+CENG:<mode>,<Ncell></p> <p>[+CENG: <cell>,"<arfcn>,<rxl>,<rxq>,<mcc>,<mnc>,<bsic>,<cellid>,<rla>,<txp>,<lac>,<TA>" <CR><LF>+CENG: <cell>,"<arfcn>,<rxl>,<bsic>[,<cellid>],<mcc>,<mnc>,<lac>"...]</p> <p>OK</p> <p>if <mode>=3 +CENG:<mode>,<Ncell></p> <p>[+CENG: <cell>,<mcc>,<mnc>,<lac>,<cellid>,<bsic>,<rxl> <CR><LF>+CENG: <cell>,<mcc>,<mnc>,<lac>,<cellid>,<bsic>,<rxl>...]</p> <p>OK</p> |
| Write Command | Response |
| AT+CENG=<mode>[,<Ncell>] | <p>Switch on or off engineering mode. Module will report +CENG: (network information) automatically if <mode>=2.</p> <p>OK</p> <p>ERROR</p> |
| Reference | <p>Note</p> <p>The rxl is csq value range 0-31,when localcell.</p> |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | | |
|----------|---|---|
| <mode> | 0 | Switch off |
| | 1 | Switch on |
| | 2 | Switch on, and activate the URC report of network information |
| | 3 | Switch on engineering mode, with limited URC report |
| <Ncell> | 0 | Un-display neighbor cell ID |
| | 1 | Display neighbor cell ID |
| | If <mode>=3, ignore this parameter. | |
| <cell> | 0 | The serving cell |
| | 1-6 | The index of the neighboring cell |
| <arfcn> | Absolute radio frequency channel number | |
| <rxl> | Receive level | |
| <rxq> | Receive quality | |
| <mcc> | Mobile country code | |
| <mnc> | Mobile network code | |
| <bsic> | Base station identity code | |
| <cellid> | Cell id | |
| <lac> | Location area code | |
| <rla> | Receive level access minimum | |
| <txp> | Transmit power maximum CCCH | |
| <TA> | Timing Advance | |

17.6 AT+DDET DTMF detection

This command is used to control DTMF detection.

| | |
|-----------------------------|---|
| Test Command | Response |
| AT+DDET=? | +DDET: (0-1) OK Or ERROR |
| Write Command | Response |
| AT+DDET=<mode> | OK Or ERROR |
| Read Command | Response |
| AT+DDET? | +DDET: <mode> OK Or ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <mode> | <u>0</u> Disable DTMF detection 1 Enable DTMF detection |

Parameters are defined below:

| Commands | Response |
|------------------------|-------------------|
| ATD13587654321; | OK |
| | +DTMF:1 |
| | +DTMF:2 |
| | +DTMF:3 |
| | +DTMF:4 |
| | +DTMF:4 |
| | +DTMF:4 |
| | +DTMF:5 |
| | +DTMF:6 |
| | +DTMF:7 |
| | +DTMF:8 |
| | +DTMF:9 |
| | +DTMF:* |
| | +DTMF:0 |
| | +DTMF:# |
| | NO CARRIER |

17.7 AT+CSDT Switch On or Off Detecting SIM Card

This command is used to switch on or off detecting SIM card.

| | |
|-----------------------------|--|
| Test Command | Response |
| AT+CSDT=? | +CSDT: (0-1) OK |
| Read Command | Response |
| AT+CSDT? | +CSDT: <mode> OK |
| Write Command | Response |
| AT+CSDT=<mode> | OK Or ERROR |
| Reference | Note User should select 8-pin SIM card holder to implement SIM card detection function. This command will save to NVRAM after setting. User should select 8-pin SIM card holder to implement SIM card detection function. |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <mode> | 0 Switch off detecting SIM card 1 Switch on detecting SIM card |

For L216 module, SIM detection pin number and name are defined below:

| Module | PIN number | PIN name |
|-------------|------------|----------------|
| L216 | 23 | SIM_DET |

Note: The support of these commands depend on firmware version.

17.8 AT+CPOWD Software Power Off

This Command is used to power off Module.

| Write Command | Response |
|---------------------------|---|
| AT+CPOWD=<n> | OK [NORMAL POWER DOWN] |
| AT+CPOWD=? | OK |

Parameters are defined below:

| Parameters | Description |
|------------------|--|
| <n> | 0 Power off urgently (Will not send "NORMAL POWER DOWN") 1 Normal power off (Will send "NORMAL POWER DOWN") |

18 HTTP & HTTPS AT Commands

Overview of HTTP & HTTPS AT Commands:

| AT Command | Description |
|----------------------|-------------------------|
| AT+HTTTPARA | Set http parameter |
| AT+HTTPSETUP | HTTP link establishment |
| AT+HTTPACTION | Sending HTTP request |
| AT+HTTPCLOSE | Close HTTP link |

Note: The support of these commands depends on firmware version.

18.1 AT+HTTTPARA Set http parameter

The command is used to set http parameter.

| Write Command | Response |
|---|--|
| AT+HTTTPARA=<para>,<value> | OK/ERROR |
| | If error +HTTTPARA: errrcode |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <para> | <p>url, target path. port, target port break, Parameter for HTTP method "GET", used for resuming broken transfer. breakend, parameter for HTTP method "GET", used for resuming broken transfer. userdata, User data dlfile, set download file name savetype, type for save palce postdata, set post body data to http server timeinterval , set the timeout second when receive one buffer between buffer receive after</p> <p>the para below only take effort when post method. and all of them can be omit</p> <p>accept: HTTP request head param accept-charsetHTTP request head param accept-encodingHTTP request head param accept-languageHTTP request head param cache-controlHTTP request head param user-agentHTTP request head param authorizationHTTP request head param cookieHTTP request head param content-typeHTTP request head param content-encodingHTTP request head param content-languageHTTP request head param content-locationHTTP request head param content-rangeHTTP request head param</p> |

| | |
|----------------------|---|
| <value> | <p>url, the maximum of 299 bytes, url supports domain name resolution, url must in quote, url must not add with http:// or https:// ,if want use https, please set with AT+HTTPSSL</p> <p>port , the maximum value is 65535, http default value is 80. https default value is 443</p> <p>break, used for resuming broken transfer.</p> <p>breakend , which is used together with "break", If the value of "breakend" is bigger than " break ", the transfer scope is from " break" to " breakend". If the value of " breakend" is smaller than " break", the transfer scope is from " break" to the end of the file.</p> <p>userdata, must in quote, user can set owner param use this</p> <p>savetype, save place, <ul style="list-style-type: none"> 0. output http content to uart(default value) 1. save http context to file 2. save http context to Ram </p> <p>dlfile, must in quote, the value below can be set to default or delete when value is "" when savetype is 0, is invalid, when savetype is 1, http context will save to file /HTTP_DATA/dlfile, if dlfile not set, will save to file /HTTP_DATA/http_receive_data when savetype is 2, http context will save to Ram,Ram only has one context at the same time ,so dlfile is invalid now</p> <p>postdata, support 50K+1 data one time</p> <p>timeinterval , the maximum is 300, default is 300</p> <p>the value below can be set to default or delete when value is ""</p> <p>accept, the maximum of 300 bytes, default value is */* , must in quote,</p> <p>accept-charset the maximum of 300 bytes, must in quote,</p> <p>accept-encoding the maximum of 300 bytes, must in quote,</p> <p>accept-language the maximum of 300 bytes, must in quote,</p> <p>cache-control the maximum of 300 bytes, must in quote,</p> <p>user-agent the maximum of 300 bytes,default is Mozilla/5.0 (Windows NT 5.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.101 Safari/537.36, must in quote,</p> <p>authorization the maximum of 300 bytes, must in quote,</p> <p>cookie the maximum of 300 bytes, must in quote,</p> <p>content-type the maximum of 300 bytes, must in quote,</p> <p>content-encoding the maximum of 300 bytes, must in quote,</p> <p>content-language the maximum of 300 bytes, must in quote,</p> <p>content-location the maximum of 300 bytes, must in quote,</p> <p>content-range the maximum of 300 bytes, must in quote,</p> |
|----------------------|---|

| | | |
|------------------|------------|---|
| errercode | 100 | param is full |
| | 101 | param is too long(post head only support to 2048 bytes) |
| | 102 | param not set yet |
| | 103 | param has been set |

Example:

| Commands | Response |
|--|---|
| HTTP | |
| AT+HTTPSSL=0 | OK |
| AT+HTTTPARA=url,"www.baidu.com" //set http url parameter | OK |
| AT+HTTTPARA=port,80 //set port //if port is 80, can be ignore | OK |
| HTTPS EXAMPLE | |
| AT+HTTPSSL=1 | OK |
| AT+HTTTPARA= url,"www.baidu.com" //set http url parameter | OK |
| OTHER PARAMS | |
| AT+HTTTPARA=accept,"text/xml,application/xml,application/xhtml+xml,text/html" //set accept //can ignore | OK |
| AT+HTTTPARA= content-type," application/x-www-form-urlencoded " //set content-type //can ignore | OK |
| AT+HTTTPARA=accept,"" //del accept restore to default | OK |
| AT+HTTTPARA=accept,"" //del accept restore to default | +HTTTPARA:102 ERROR |
| AT+HTTTPARA= postdata,100 //input post data to server //then use //AT+HTTTPACTION=2 to put //them to server | DOWNLOAD (input 100 bytes data) OK |

18.2 AT+HTTPSETUP HTTP link establishment

The command is used to create HTTP link.

| Execution Command | Response |
|---------------------|---|
| AT+HTTPSETUP | OK/ERROR |
| | +HTTPSETUP:errorcode |
| | The correct destination address and port can be established successfully. |

Parameters are defined below:

| Parameters | Description |
|---------------|--------------------------|
| < errorcode > | 105 connect server error |

Example:

| Commands | Response |
|---|-----------|
| AT+HTTPSETUP //creating HTTP link | OK |

18.3 AT+HTTPACTION Sending HTTP request

The command is used to send HTTP request.

| | |
|-----------------------------------|---------------------------------------|
| Write Command | Response |
| AT+HTTPACTION=<mode> | OK/ERROR |
| | If AT+HTTTPARA param <savetype= 1or2> |
| | If http receive success |
| | +HTTPACTION: 0, length |
| | If error |
| | +HTTPACTION: error_code |

Parameters are defined below:

| Parameters | Description |
|---------------------------|--|
| <mode> | 0 HTTP GET request 1 HTTP HEAD request 2 HTTP POST request 99 OTHER request |
| <length> | Maximum 1024,length of HTTP POST request body. |
| <string> | Value of HTTP POST request body OR other request content Post request value must in quote |
| <error_code> | 601. network error 602 . memory is full |

Example:

| Commands | Response |
|------------------------|----------|
| AT+HTTTPARA=savetype,0 | OK |

| | |
|---|---|
| AT+HTTPACTION=0 //send HTTP GET request | OK +HTTPRECV: 1024, HTTP/1.1 200 OK Date: Fri, 11 Sep 2015 05:21:54 GMT Content-Type: image/jpeg Content-Length: 6 Connection: close ETag: "2815057560" Last-Modified: Wed, 09 Sep 2015 01:33:59 GMT Expires: Fri, 11 Sep 2015 05:22:54 GMT Cache-Control: max-age=60 Lfy: st01.i6 Accept-Ranges: bytes □ 123456 |
| AT+HTTPACTION=1 //send HTTP HEAD request | OK +HTTPRECV: 1024, HTTP/1.1 200 OK Date: Fri, 11 Sep 2015 05:25:57 GMT Content-Type: image/jpeg Content-Length: 24794 Connection: close ETag: "2815057560" Last-Modified: Wed, 09 Sep 2015 01:33:59 GMT Expires: Fri, 11 Sep 2015 05:26:57 GMT Cache-Control: max-age=60 Lfy: cq02.i4 Accept-Ranges: bytes |
| AT+HTTPACTION=2 //send HTTP POST request | OK +HTTPRECV: 100, HTTP/1.1 200 OK Date: Fri, 11 Sep 2015 05:25:57 GMT ... |
| AT+HTTPACTION=99, GET http://www.baidu.com HTTP/1.1\r\nHOST: www.baidu.com\r\n\r\n | OK |
| AT+HTTTPARA=savetype,1 | OK |
| AT+HTTPACTION=0 //send HTTP GET request | OK +HTTPACTION:0,2321 |
| AT+HTTTPARA=savetype,2 | OK |

| | |
|--|--|
| AT+HTTPACTION=0 //send HTTP GET request | OK +HTTPACTION:0,2321 |
|--|--|

18.4 AT+HTTPREAD read http content

The command is used to read HTTP content back from server.

| Write Command | Response |
|--|---|
| AT+HTTPREAD=<start_pos>,<read_length>[,<file_name>] | +HTTPREAD: content_length OK/ERROR |

Parameters are defined below:

| Parameters | Description |
|---------------------------------|--|
| < start_pos > | Start position for read http content, max value is 300k, if value is bigger than real file size, will return ERROR |
| < read_length > | The length for read http content from <start_pos> , if value is less than real length can be read, will return real read length in <content_length> , 1024 is the max! |
| < file_name > | Read file name, must in quote |
| < content_length > | Real length for |

NOTE: read place is up to AT+HTTTPARA param **<savetype>**,

when **<savetype>** is 0 , return ERROR

when **<savetype>** is 1, if **<file_name>** not set, will read file /HTTP_DATA/http_receive_data, otherwise, will read file /HTTP_DATA/file_name

when **<savetype>** is 2, **<file_name>** is invalid, will read content store in Ram

Example:

suppose has file /HTTP_DATA/http_receive_data and /HTTP_DATA/abc.txt

| Commands | Response |
|-------------------------------|-----------|
| AT+HTTTPARA=savetype,1 | OK |

| | |
|-------------------------------------|---|
| AT+HTTPREAD=0,1000 | +HTTPREAD:1000 (file content) OK |
| AT+HTTPREAD=0,1000,"abc.txt" | +HTTPREAD:1000 (file content) OK |
| AT+HTTPPARA=savetyp,2 | OK |
| AT+ HTTPREAD=0,1000 | +HTTPREAD:1000 (ram content) OK |

18.5 AT+HTTPCLOSE Close HTTP link

The command is used to close HTTP link

| Execution Command | Response |
|---------------------|---|
| AT+HTTPCLOSE | OK/ERROR Note Executing the command will clean paramter which executing HTTPPARA command setting. |

Example:

| Commands | Response |
|--|-----------|
| AT+HTTPCLOSE //close HTTP link | OK |

19 SSL/TLS AT command

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19.1 AT+CIPSSL SET TCP SSL FUNCTION

The command is to set TCP use SSL function

| | |
|---|---|
| Write Command | Response |
| In multiple IP connection AT+CIPSSL=<id>,<on/off> | |
| In single IP connection AT+CIPSSL=<on/off> | OK |
| Read Command AT+CIPSSL? | Response In multiple IP connection +CIPSSL:<id>,<on/off> OK In single IP connection +CIPSSL:<on/off> OK |
| Test Command AT+CIPSSL=? | Response OK |
| | Note: The certificates should put into follow directories: Z:\CertCA\ CA: used to verify server's certificate Certificates used in mutual authentication: Z:\CertPub\ Client certificate Z:\CertKey\ Client private key, |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <id> | 0-5 socket index |
| <on/off> | 0 turn off SSL function 1 turn on SSL function |

Example:

| Commands | Response |
|------------------------|-----------|
| AT+CSTT="CMNET" | OK |
| AT+CIICR | OK |
| AT+CIPSSL=1 | OK |

| | |
|--|--|
| AT+CIPSTART="TCP","180.97.33.107","443" | OK 0, CONNECT OK |
| AT+CIPSEND=0,137 | > 0, SEND OK |
| AT+CIPCLOSE=0 | 0, CLOSE OK |

19.2 AT+CIPSSLVM Set TCP SSL Verification Mode

The command is used to set the verification mode of TCP SSL connection

| | |
|---|---|
| Write Command | Response |
| In multiple IP connection AT+ CIPSSLVM =<id>,<on/off> | |
| In single IP connection AT+ CIPSSLVM =<on/off> | OK |
| Read Command AT+ CIPSSLVM? | Response In multiple IP connection + CIPSSLVM:<id>,<on/off> OK In single IP connection + CIPSSLVM:<on/off> OK |
| Test Command AT+ CIPSSLVM =? | Response OK |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <id> | 0-5 socket index |
| <on/off> | 0 Verify none 1 Verify peer's certificate |

Example:

| Commands | Response |
|---|-----------|
| Put the server's CA cert into file system, path is Z:\CertCA\ | |
| AT+CSTT="CMNET" | OK |
| AT+CIICR | OK |

| | |
|--|--|
| AT+CIPSSL=1 | OK |
| AT+ CIPSSL SKC =1 | OK |
| AT+CIPSTART="TCP","180.97.33.107","443" | OK 0, CONNECT OK |
| AT+CIPSEND=0,137 | > 0, SEND OK |
| AT+CIPCLOSE=0 | 0, CLOSE OK |

19.3 AT+HTTPSSL Set http ssl function

set http use ssl function

Format

| | |
|---|---|
| Write Command AT+HTTPSSL=<mode> | Response OK ERROR |
| Read Command AT+HTTPSSL? | Response +HTTPSSL: <mode> |
| Test Command AT+HTTPSSL=? | Response OK |
| Parameters | Description |
| mode | 0 turn off ssl function 1 turn on ssl function |
| | Note: SSL&TLS is support TLSv1.0. |

Example:

| | |
|---------------------|-----------|
| Commands | Response |
| AT+HTTPSSL=1 | OK |

| | |
|--|-----------|
| AT+HTTPPARA=URL,"www.baidu.com" //must no HTTPS:// Scheme | OK |
| AT+HTTPSETUP | OK |
| AT+HTTPACTION=0 | OK |

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20 AUDIO AT Commands

Overview of AUDIO AT Commands:

| AT Command | Description |
|-------------------|----------------|
| AT+ZAUDREC | Audio function |

20.1 AT+ZAUDREC Audio function

The command is used to audio function.

| | |
|--|---|
| Test Command | Response |
| AT+ZAUDREC=? | +ZAUDREC: (0-6), [file_name] OK |
| Read Command | Response |
| AT+ZAUDREC? | +ZAUDREC:<Files_number>,<File_name1>,<len1>,<File_name2>,<len2> OK |
| Write Command | Response |
| AT+ZAUDREC=<Mode>[,<File_name>] | OK/ERROR |
| | Note: If reported +ZAUDREC: 1,0 means memory full, Reset will lost all recording file! |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|-----------------|--|
| mode | 0 Start record 1 Stop record 2 Play record 3 Stop play record 4 Delete record 5 Play record in call 6 Stop play record in call |
| filename | Record file name, do not need suffix, suffix is wav, if mode is 0、2、4、5, this field is valid, if 0、2、5 do not have this field, default name is rec |
| File_num | File number |
| len | File size |

Example:

| Commands | Response |
|----------------------------|-----------------------------|
| AT+ZAUDREC=0, "rec" | OK |
| AT+ZAUDREC=1 | OK |
| AT+ZAUDREC=2, "rec" | OK |
| AT+ZAUDREC=3 | OK |
| AT+ZAUDREC=4, "rec" | OK |
| AT+ZAUDREC=5, "rec" | OK |
| AT+ZAUDREC=6 | OK |
| AT+ZAUDREC? | +ZAUDREC: 1, rec.wav, 66332 |

21 FTP AT Commands

Overview of FTPAT Commands:

| AT Command | Description |
|-----------------------|--|
| AT+FTPPORT | Set FTP Control Port |
| AT+FTPMODE | Set Active or Passive FTP Mode |
| AT+FTPTYPE | Set the Type of Data to Be Transferred |
| AT+FTPPUTOPT | Set FTP Put Type |
| AT+FTPREST | Set Resume Broken Download |
| AT+FTPSERV | Set FTP Server Address |
| AT+FTPUN | Set FTP User Name |
| AT+FTPPW | Set FTP Password |
| AT+FTPGETNAME | Set Download File Name |
| AT+FTPGETPATH | Set Download File Path |
| AT+ FTPPUTNAME | Set Upload File Name |
| AT+FTPPUTPATH | Set Upload File Path |
| AT+FTPGET | Download File |
| AT+FTPPUT | Set Upload File |
| AT+FTPSCONT | Save FTP Application Context |
| AT+FTPDELE | Delete Specified File in FTP Server |
| AT+FTPSIZE | Get the Size of Specified File in FTP Server |
| AT+FTPSTATE | Get the FTP State |
| AT+FTPMKD | Make Directory on the Remote Machine |
| AT+FTPRMD | Remove Directory on the Remote Machine |
| AT+FTPLIST | Set the Type of Data to Be Transferred |
| AT+FTPGETTOFS | Download File and Save in File System |
| AT+FTPPUTFRMFS | Upload File from File System. |
| AT+FTPEXTGET | Extend Download File. |
| AT+FTPEXTPUT | Extend Upload File. |

| | |
|----------------------|---|
| AT+FTPFILEPUT | Load File in RAM from File System then Upload with FTPPUT |
| AT+FTPQUIT | Quit Current FTP Session |
| AT+SAPBR | Set the info about ftp and active ftp pdp context |

Note: The support of these commands depend on firmware version.

21.1 AT+FTPPORT Set FTP Control Port

The command is used to set ftp control port.

Format

| | |
|--|---|
| Write Command AT+FTPPORT=<value> | Response OK |
| Read Command AT+FTPPORT? | Response +FTPPORT: <value> OK |
| Test Command AT+FTPPORT=? | Response OK |

Field

| Parameters | Description |
|----------------------|---|
| <value> | The value of FTP Control port, from 1 to 65535. Default value is 21 |

Example:

| Commands | Response |
|----------------------|-----------|
| AT+FTPPORT=21 | OK |

21.2 AT+FTPMODE Set Active or Passive FTP Mode

The command is used to set ftp mode active or passive.

Format

| | |
|---------------------------------|---|
| Write Command | Response |
| AT+FTPMODE=<value> | OK |
| Read Command | Response |
| AT+FTPMODE? | +FTPMODE: <value> OK |
| Test Command | Response |
| AT+FTPMODE=? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <value> | 0 Active FTP mode 1 Passive FTP mode |

Example:

| | |
|---------------------|-----------|
| Commands | Response |
| AT+FTPMODE=1 | OK |

21.3 AT+FTPTYPE Set the Type of Data to Be Transferred

The command is used to set the Type of Data to Be Transferred

Format

| | |
|---------------------------------|--|
| Write Command | Response |
| AT+FTPTYPE=<value> | OK |
| Read Command | Response |
| AT+FTPTYPE? | + FTPTYPE: <value> OK |
| Test Command | Response |
| AT+FTPTYPE=? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <value> | "A" For FTP ASCII sessions "I" For FTP Binary sessions |

Example:

| | |
|-----------------------|-----------|
| Commands | Response |
| AT+FTPTYPE="A" | OK |

21.4 **AT+FTPPUTOPT** Set FTP Put Type

The command is used to set FTP Put Type

Format

| | |
|-----------------------------------|-----------|
| Write Command | Response |
| AT+FTPPUTOPT=<value> | OK |

| | |
|-----------------------|---|
| Read Command | Response |
| AT+FTPPUTOPT? | +FTPPUTOPT: <value> OK |
| Test Command | Response |
| AT+FTPPUTOPT=? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <value> | "APPE" For appending file "STOU" For storing unique file "STOR" For storing file Default is "STOR" |

Example:

| | |
|----------------------------|-----------|
| Commands | Response |
| AT+FTPPUTOPT="STOU" | OK |

21.5 AT+FTPREST Set Resume Broken Download

The command is used to set Resume Broken Download

Format

| | |
|---------------------------------|---|
| Write Command | Response |
| AT+FTPREST=<value> | OK |
| Read Command | Response |
| AT+FTPREST? | +FTPREST: <value> OK |

| | |
|---------------------|-----------|
| Test Command | Response |
| AT+FTPREST=? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <value> | Broken point to be resumed from 0 to 4294967295. (byte) |

Example:

| | |
|-----------------------|-----------|
| Commands | Response |
| AT+FTPREST=100 | OK |

21.6 AT+FTPSERV Set FTP Server Address

The command is used to set FTP Server Address

Format

| | |
|---------------------------------|--|
| Write Command | Response |
| AT+FTPSERV=<value> | OK |
| Read Command | Response |
| AT+FTPSERV? | + FTPSERV: <value> OK |
| Test Command | Response |
| AT+FTPSERV=? | OK |

| Field | |
|----------------------|---|
| Parameters | Description |
| <value> | 32-bit number in dotted-decimal notation (i.e.xxx.xxx.xxx)or alphanumeric ASCII text string up to 49 characters if DNS is available |

Example:

| Commands | Response |
|---|-----------|
| AT+FTPSERV= "182.150.28.206" | OK |

21.7 AT+FTPUN set FTP User Name

The command is used to set FTP User Name

Format

| | |
|-------------------------------|-------------------------------------|
| Write Command | Response |
| AT+FTPUN=<value> | OK |
| Read Command | Response |
| AT+FTPUN? | +FTPUN: <value> OK |
| Test Command | Response |
| AT+FTPUN=? | OK |

| Field | |
|----------------------|--|
| Parameters | Description |
| <value> | Alphanumeric ASCII text string up to 48 characters |

Example:

| Commands | Response |
|--------------------------|-----------|
| AT+FTPUN="cd_ftp" | OK |

21.8 AT+FTPPW Set FTP Password

The command is used to Set FTP Password

| | |
|-------------------------------|---|
| Write Command | Response |
| AT+FTPPW=<value> | OK |
| Read Command | Response |
| AT+FTPPW? | +FTPPW: <value> OK |
| Test Command | Response |
| AT+FTPPW=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <value> | Alphanumeric ASCII text string up to 48 characters |

Example:

| Commands | Response |
|---------------------------|-----------|
| AT+FTPPW ="cd_ftp" | OK |

21.9 AT+FTPGETNAME Set Download File Name

The command is used to set the download file name.

Format

| | |
|------------------------------------|---|
| Write Command | Response |
| AT+FTPGETNAME=<value> | OK |
| Read Command | Response |
| AT+FTPGETNAME? | + FTPGETNAME: <value> OK |
| Test Command | Response |
| AT+FTPGETNAME=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <value> | Alphanumeric ASCII text string up to 99 characters |

Example:

| | |
|---------------------------------|-----------|
| Commands | Response |
| AT+FTPGETNAME="test.txt" | OK |

21.10 AT+FTPGETPATH Set Download File Path

The command is used to Set Download File Path

Format

| | |
|------------------------------------|--|
| Write Command | Response |
| AT+FTPGETPATH=<value> | OK |
| Read Command | Response |
| AT+FTPGETPATH? | +FTPGETPATH: <value> OK |
| Test Command | Response |
| AT+FTPGETPATH=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <value> | Alphanumeric ASCII text string up to 99 characters |

Example:

| Commands | Response |
|----------------------------|-----------|
| AT+ FTPGETPATH ="/" | OK |

21.11 **AT+FTPPUTNAME** Set Upload File Name

The command is used to set Upload File Name

Format

| | |
|------------------------------------|-----------|
| Write Command | Response |
| AT+FTPPUTNAME=<value> | OK |

| | |
|------------------------|--|
| Read Command | Response |
| AT+FTPPUTNAME? | +FTPPUTNAME: <value> OK |
| Test Command | Response |
| AT+FTPPUTNAME=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <value> | Alphanumeric ASCII text string up to 99 characters |

Example:

| | |
|---------------------------------|-----------|
| Commands | Response |
| AT+FTPPUTNAME="deng.txt" | OK |

21.12 **AT+FTPPUTPATH** Set Upload File Path

The command is used to set Upload File Path

Format

| | |
|------------------------------------|--|
| Write Command | Response |
| AT+FTPPUTPATH=<value> | OK |
| Read Command | Response |
| AT+FTPPUTPATH? | +FTPPUTPATH: <value> OK |

| Test Command | Response |
|------------------------|----------|
| AT+FTPPUTPATH=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <value> | Alphanumeric ASCII text string up to 99 characters |

Example:

| Commands | Response |
|----------------------------|----------|
| AT+ FTTPUTPATH ="/" | OK |

21.13 AT+FTPGET Download File

The command is used to download File

Format

| Write Command | Response |
|--|---|
| AT+FTPGET=<mode>[,<reqlengt h>] | <p>If mode is 1 and it is a successful FTP get session: OK +FTPGET: 1,1</p> <p>If data transfer finished: +FTPGET: 1,0</p> <p>If mode is 1 and it is a failed FTP get session: OK +FTPGET: 1,<error></p> <p>If mode is 2: +FTPGET: 2,<cnflength> 012345678... OK</p> |

| Test Command | Response |
|----------------------|-----------|
| AT+ FTPGET =? | OK |

Field

| Parameters | Description |
|--------------------------|--|
| <mode> | 1 For opening FTP get session 2 For reading FTP download data. |
| <reqlength> | Requested number of data bytes (1-1460) to be read |
| <cnflength> | Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read |
| <error> | 61 Net error 62 DNS error 63 Connect error 64 Timeout 65 Server error 66 Operation not allow 70 Replay error 71 User error 72 Password error 73 Type error 74 Rest error 75 Passive error 76 Active error 77 Operate error 78 Upload error 79 Download error 80 File error 86 Manual quit |
| Timeout | 75 seconds |
| Notify | When "+FTPGET:1,1" is shown, then use AT+FTPGET=2,<reqlength> to read data. If the module still has unread data, "+FTPGET:1,1" will be shown again in a certain time.(5 seconds) |

Example:

| Commands | Response |
|----------|----------|
|----------|----------|

| | |
|-------------------------|--|
| AT+FTPGET=1 | OK +FTPGET: 1,1 |
| AT+FTPGET=2,1024 | +FTPGET: 2,1011 01234567890123456789012345678901234567890123456789..... OK +FTPGET: 1,1 |
| AT+FTPGET=2,1024 | +FTPGET: 2,50 01234567890123456789012345678901234567890123456789 OK +FTPGET: 1,0 |

21.14 AT+FTPPUT Set Upload File

The command is used to set Upload File

Format

| Write Command | Response |
|--|---|
| AT+FTPPUT=<mode>[,<reqlength>h>] | <p>If mode is 1 and it is a successful FTP get session: OK +FTPPUT: 1,1,<maxlength></p> <p>If mode is 1 and it is a failed FTP get session: OK +FTPPUT: 1,<error></p> <p>If mode is 2 and <reqlength> is not 0 +FTPPUT: 2,<cnflength> //Input data OK</p> <p>If mode is 2 and <reqlength> is 0, it will respond OK, and FTP session will be closed OK</p> <p>If data transfer finished. +FTPPUT: 1,0</p> |

| Test Command | Response |
|--------------------|-----------|
| AT+FTPPUT=? | OK |

Field

| Parameters | Description |
|--------------------------|---|
| <mode> | 1 For opening FTP put session 2 For writing FTP upload data. |
| <reqlength> | Requested number of data bytes(0-<maxlength>) to be transmitted |
| <cnflength> | Confirmed number of data bytes to be transmitted |
| <maxlength> | The max. length of data can be sent at a time. It depends on the network status |
| <error> | See "AT+FTPGET" |
| Timeout | 75 seconds |
| Notify | When "+FTPPUT:1,1,<maxlength>" is shown, then use "AT+FTPPUT=2,<reqlength>" to write data. If you want finish input, should end with AT+FTPPUT=2,0 |

Example:

| Commands | Response |
|---|---------------------------------------|
| AT+FTPPUT=1 | OK +FTPPUT: 1,1,1360 |
| AT+FTPPUT=2,1024 01234567890123456789012 345678901234 567890123456 789..... (must up to 1024) OK | +FTPPUT: 1,1,1360 |
| AT+FTPPUT=2,100 01234567890123456789012 345678901234 567890123456 789..... (must up to 100) OK | +FTPPUT: 1,1,1360 |

AT+ FTPPUT=2,0**+FTPPUT:1,0**

21.15 AT+FTPSCONT Save FTP Application Context

The command is used to save FTP Application Context

Format

| | |
|----------------------|---|
| Write Command | Response |
| AT+FTPSCONT | OK |
| Read Command | Response |
| AT+FTPSCONT? | +FTPSCONT: <mode> +FTPSERV: <value> +FTPPORT: <value> +FTPUN: <value> +FTPPW: <value> +FTPCID: <value> +FTPMODE: <value> +FTPTYPE: <value> +FTPPUTOPT: <value> +FTPREST: <value> +FTPGETNAME: <value> +FTPGETPATH: <value> +FTPPUTNAME: <value> +FTPPUTPATH: <value> +FTPTIMEOUT: <value> OK |
| Test Command | Response |
| AT+FTPSCONT=? | OK |

Field

| Parameters | Description |
|---------------------|--|
| <mode> | 0 Saved, the value from NVRAM 1 Unsaved, the value from RAM |

| | |
|---------------|--|
| Notify | UE saves FTP Application Context which consist of following AT Command parameters, and when system is rebooted, the parameters will be loaded automatically. |
|---------------|--|

Example:

| Commands | Response |
|----------------------|---|
| AT+ FTPSCONT? | +FTPSCONT:<0> +FTPSERV: <182.150.28.206> +FTPPORT:<2100> +FTPUN: <cd_ftp> +FTPPW:<cd_ftp> +FTPCID: <1> +FTPMODE:<1> +FTPTYPE:<l> +FTPPUTOPT:<STOU> +FTPREST:<0> +FTPGETNAME:<deng1.txt> +FTPGETPATH:</> +FTPPUTNAME:<deng1.txt> +FTPPUTPATH:</> +FTPTIMEOUT: <75> OK |
| AT+ FTPSCONT | OK |

21.16 AT+FTPDELE Delete Specified File in FTP Server

The command is used to delete Specified File in FTP Server

Format

| Execution Command | Response |
|--------------------|--|
| AT+ FTPDELE | If succeed: OK +FTPDELE:1,0 If failed: OK +FTPDELE: 1,<error> |

| Test Command | Response |
|----------------------|-----------|
| AT+ FTPDELE=? | OK |

Field

| | |
|----------------|--|
| Notify | The file to be deleted is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands. |
| timeout | 75 seconds |

Example:

| Commands | Response |
|--------------------|-----------|
| AT+ FTPDELE | OK |

21.17 **AT+FTPSIZE** Get the Size of Specified File in FTP Server

The command is used to get the Size of Specified File in FTP Server

Format

| Execution Command | Response |
|----------------------|--|
| AT+FTPSIZE | If succeed: OK +FTPSIZE:1,0,<size> If failed: OK +FTPSIZE:1,<error>,<0> |
| Test Command | Response |
| AT+FTPSIZE =? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <error> | See "AT+FTPGET" |
| <size> | The file size. Unit: byte The file is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands. |

Example:

| Commands | Response |
|--------------------|---------------------------------------|
| AT+ FTPSIZE | OK +FTPSIZE: 1,0,300 |

21.18 AT+FTPSTATE Get the FTP State

The command is used to get the FTP State

Format

| Execution Command | Response |
|----------------------|--|
| AT+ FTPSTATE | +FTPSTATE: <state> OK |
| Test Command | Response |
| AT+FTPSTATE=? | OK |

Field

| Parameters | Description |
|----------------------|--|
| <state> | 0 idle 1 in the FTP session, including FTPGET, FTPPUT, FTPDELE and FTPSIZE operation. |

Example:

| Commands | Response |
|--------------------|----------------------------------|
| AT+FTPSTATE | +FTPSTATE: 0 OK |

21.19 AT+FTPMKD Make Directory on the Remote Machine

The command is used to make Directory on the Remote Machine

Format

| | |
|---------------------|--|
| Execution Command | Response |
| AT+ FTPMKD | OK If success: OK +FTPMKD: 1,0 If failed: OK +FTPMKD: 1,<error> |
| Test Command | Response |
| AT+ FTPMKD=? | OK |

Field

| Parameters | Description |
|----------------------|---|
| <error> | See “AT+FTPGET” The created folder is specified by the “AT+FTPGETPATH” command. |
| Timeout | 75 seconds |

Example:

| | |
|-------------------|----------------------------------|
| Commands | Response |
| AT+ FTPMKD | OK +FTPMKD: 1,0 |

21.20 AT+FTPRMD Remove Directory on the Remote Machine

The command is used to remove Directory on the Remote Machine

Format

| | |
|--------------------|---|
| Execution Command | Response |
| AT+FTPRMD | If success: OK +FTPRMD: 1,0 If failed: OK +FTPRMD: 1,<error> |
| Test Command | Response |
| AT+FTPRMD=? | OK |

Field

| | |
|----------------------|--|
| Parameters | Description |
| <error> | See “AT+FTPGET” The removed folder is specified by the “AT+FTPGETPATH” command. |
| Timeout | 75 seconds |

Example:

| | |
|------------------|----------------------------------|
| Commands | Response |
| AT+FTPRMD | OK +FTPRMD: 1,0 |

21.21 **AT+FTPLIST** List Contents of Directory on the Remote Machine

The command is used to list contents of directory on the remote machine

Format

| | |
|---|---|
| Write Command | Response |
| AT+FTPLIST=<mode>[,<reqlengt h>] | <p>If mode is 1 and it is a successful FTP get session: OK +FTPLIST: 1,1</p> <p>If data transfer is finished: +FTPLIST: 1,0</p> <p>If mode is 1 and it is a failed FTP get session: OK +FTPLIST: 1,<error></p> <p>If mode is 2: +FTPLIST: 2,<cnflength> 012345678... OK</p> |
| Test Command | Response |
| AT+ FTPLIST=? | OK |

Field

| Parameters | Description |
|--------------------------|--|
| <mode> | 1 For opening FTP get file list session 2 For reading FTP file list |
| <reqlength> | Requested number of data bytes (1-1460) to be read |
| <cnflength> | Confirmed number of data bytes to be read, which may be less than <reqlength>. 0 indicates that no data can be read. |
| <error> | See "AT+FTPGET" |

Example:

| Commands | Response |
|----------------------|---------------------------------------|
| AT+FTPLIST =1 | OK + FTPLIST:1,1 |

```

AT+ FTPLIST=2,1024      +FTPLIST: 2,50
                           2016/08/25  19:20    <DIR>      .
                           2016/08/25  19:20    <DIR>      ..
                           2015/11/04  16:39    <DIR>      .android
                           2016/09/06  18:37              1,164 .bash_history
                           2015/10/28  15:39    <DIR>      .config
                           2016/01/12  18:06              360 .gitconfig
                           2016/07/25                      17:11
                           <DIR>      .oracle_jre_usage
                           2016/07/27  17:23    <DIR>      .ssh
                           2016/07/07  13:32    <DIR>      .VirtualBox
                           2015/12/16  16:16              4,425 aaa
                           2016/03/10  15:36              16,740 aaa.txt
                           2016/03/16  16:21              10,425 aaaaaffdf.txt
                           2016/04/26  19:07    <DIR>      AppData
                           2016/03/18  10:21              12,065 bing.txt

                           OK
                           +FTPLIST:1,0

```

21.22 AT+FTPGETTOFS Download File and Save in File System

The command is used to download File and Save in File System

Format

| | |
|--|---|
| Write Command | Response |
| AT+FTPGETTOFS=<loc>,<filename>[,<num>,<time>] | <p>If it is a successful FTP get session:</p> <p>OK</p> <p>If data transfer finished.</p> <p>+FTPGETTOFS: 0,<totalLength></p> <p>If it is a failed FTP get session:</p> <p>OK</p> <p>+FTPGETTOFS: <error></p> |
| Read Command | Response |
| AT+ FTPGETTOFS? | <p>+FTPGETTOFS:</p> <p><status>[,<receivedLength>,<writeLength>]</p> |

| Test Command | Response |
|-------------------------|-----------|
| AT+ FTPGETTOFS=? | OK |

Field

| Parameters | Description |
|----------------------------|---|
| <status> | 0 not in the process 1 during the process |
| <loc> | 0 saved in ROM 1 saved in SD card |
| <filename> | Alphanumeric ASCII text string up to 64 characters |
| <num> | Number of automatic reconnect times, from 0 to 255. Default value is 3. |
| <time> | wait time before module start automatic reconnect, from 0 to 60 seconds. Default value is 5 seconds. (when waiting reconnect, will not allow to other upload or download at commands) |
| <totalLength> | The total length of data bytes have been saved |
| Notify | File will be overwritten if you start this function twice with a same filename. All local file will save in path Z:\FTP_DOWNLOADDE |

Example:

| Commands | Response |
|---------------------------------|---|
| at+ftpgettofs=0,"aa.txt" | OK +FTPGETTOFS: 0,174125 |

21.23 AT+FTPPUTFRMFS Upload File from File System.

The command is used to upload File from File System.

Format

| | |
|--|--|
| Write Command AT+FTPPUTFRMFS=<filename>[,<num>,<time>] | Response If it is a successful FTP put session: OK If data transfer finished. +FTPPUTFRMFS: 0,<totalLength> If it is a failed FTP put session: OK +FTPPUTFRMFS: <error> |
| Read Command AT+ FTTPUTFRMFS? | Response +FTPPUTFRMFS: <status>[,<putLength>] OK |
| Test Command AT+ FTTPUTFRMFS=? | Response OK |

Field

| Parameters | Description |
|----------------------------|---|
| <filename> | Alphanumeric ASCII text string up to 64 characters |
| <putLength> | the data length uploaded from File System |
| <num> | Number of automatic reconnect times, from 0 to 255. Default value is 3. |
| <time> | wait time before module start automatic reconnect, from 0 to 60seconds.Default value is 5 seconds. (when waiting reconnect, will not allow to other upload or download at commands) |
| <totalLength> | the data length uploaded from File System |
| <status> | the process status of uploading File from File System through FTP 0 not in the process 1 during the process |

Example:

| Commands | Response |
|-----------------------------------|----------------------------------|
| AT+FTPPUTFRMFS="deng1.txt" | OK +FTPPUTFRMFS: 0,552 |

21.24 AT+FTPEXTGET Extend Download File.

The command is used to extend Download File.

Format

| | |
|--|--|
| Write Command | Response |
| 1)if mode is 0 or 1 AT+FTPEXTGET=<mode> | If mode is 0 OK If it is a successful FTP get session in mode 1: OK |
| 2)if mode is 2 AT+FTPEXTGET=<mode>,<filename> | If data transfer finished in mode 1 +FTPEXTGET: 1,0 If it is a failed FTP get session in mode 1: OK +FTPEXTGET: 1,<error> |
| 3)if mode is 3 AT+FTPEXTGET=<mode>,<readPosition>,<readLength> | If mode is 2: +FTPEXTGET: 2,<totalLength> OK If mode is 3: +FTPEXTGET: 3,<outputLength> |
| Read Command AT+FTPEXTGET? | Response +FTPEXTGET: <status>[,<putLength>] OK |
| Test Command AT+FTPEXTGET=? | Response OK |

Field

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|-----------------------------|--|
| <mode> | 0 use default FTPGET method 1 start extend FTPGET method 2 save download data to file system 3 output download data |
| <filename> | file name to write data in mode 2. Alphanumeric ASCII text string up to 64 characters. |
| <readPosition> | position start read data in mode 3. depend on firmware version |
| <readLength> | read length in mode 3. depend on firmware version |
| <totalLength> | The total length of data bytes have been download |
| <outputLength> | total length will be output from serial port |
| timeout | 75 seconds |
| Notify | Can't use this function when set FTPEXTPUT mode 1 |

Example:

| Commands | Response |
|----------------------------------|---|
| AT+FTPEXTGET=1 | OK |
| AT+FTPEXTGET? | +FTPEXTGET: 1,1123 OK |
| | +FTPEXTGET: 1,0 |
| AT+FTPEXTGET=2,"addf.txt" | +FTPEXTGET: 2,3222 |
| AT+FTPEXTGET=3,0,3222 | +FTPEXTGET: 2,3222 (output data) OK |
| AT+FTPEXTGET=0 | OK |

21.25 AT+FTPEXTPUT Extend Upload File.

The command is used to Extend Upload File.

Format

| | |
|--|--|
| Write Command AT+FTPEXTPUT=<mode>[,<pos> ,<len>,<timeout>] | Response If mode is 0 or 1 OK If mode is 2 +FTPEXTPUT: <pos>,<len> |
| Read Command AT+FTPEXTPUT? | Response +FTPEXTPUT: <status>[,<putLength>] OK |
| Test Command AT+FTPEXTPUT=? | Response OK |

Field

| Parameters | Description |
|------------------------|--|
| <mode> | 0 use default FTPPUT method 1 use extend FTPPUT method 2 download data which need to PUT to RAM |
| <pos> | data offset address 0-50k |
| <len> | data length 0-50k |
| <timeout> | timeout value of serial port 1000ms-1000000ms |
| Notify | When extend FTPPUT mode is activated, input data then execute “AT+FTPPUT=1” to transmit, after session is complete, if successful, it returns “+FTPPUT: 1,0”, otherwise it returns “+FTPPUT: 1,<error>”,<error> see “AT+FTPGET”. Can not use this function when set FTPFILEPUT and FTPEXTGET mode 1 |

Example:

| | |
|----------|----------|
| Commands | Response |
|----------|----------|

| | |
|---|----------------------------------|
| AT+FTPEXTPUT=1 | OK |
| AT+FTPEXTPUT=2,0,1024,100000 | 2,0,1024,10000 |
|(input data must up to 10024) | OK |
| AT+FTPPUT=1 | OK +FTPPUT: 1,0 |
| AT+FTPEXTPUT=0 | OK |

21.26 **AT+FTPFILEPUT** Load File in RAM from File System then Upload with FTPPUT.

The command is used to Load File in RAM from File System then Upload with FTPPUT.

Format

| | |
|--|---------------------------|
| Write Command | Response |
| AT+FTPFILEPUT=<mode>[,filename] | OK ERROR |
| Test Command | Response |
| AT+FTPFILEPUT=? | OK |

Field

| Parameters | Description |
|-------------------------|--|
| <mode> | 0 not use FTPFILEPUT method 1 use FTPFILEPUT method |
| <filename> | file name to write data in mode 1. Alphanumeric ASCII text string up to 64 characters. |
| Notify | Can not use this function when set FTPEXTPUT and FTPEXTGET mode 1 |

Example:

| Commands | Response |
|---------------------------------|---------------------|
| AT+FTPFILEPUT=1,"ni.txt" | OK |
| AT+FTPPUT=1 | OK |
| | +FTPPUT: 1,0 |
| AT+FTPFILEPUT=0 | OK |

21.27 AT+FTPQUIT Quit Current FTP Session

The command is used to quit Current FTP Session

Format

| Execution Command | Response |
|----------------------|--|
| AT+ FTPQUIT | OK +CURRENT_CMD: 1,86 |
| Test Command | Response |
| AT+ FTPQUIT=? | OK |

| Parameters | Description |
|----------------------------|---------------------|
| <CURRENT_CMD> | Current ftp command |

Example: Example:

| Commands | Response |
|--------------------|-----------------------------------|
| AT+ FTPQUIT | OK +FTP: 1,86 |
| AT+FTPGET=1 | OK |
| AT+ FTPQUIT | OK +FTPGET: 1,86 |

| | |
|--------------------|-----------------------------------|
| AT+FTPPUT=1 | OK |
| AT+ FTPQUIT | OK +FTPPUT: 1,86 |

21.28 **AT+SAPBR** Set the info about ftp and active ftp pdp

context

The command is used to set the info about ftp and active ftp pdp context

Format

| | |
|--|--|
| Write Command | Response |
| AT+SAPBR=<cmd_type>,<cid>[,<ConParamTag>,<ConParamValue>] | OK If <cmd_type> = 2 +SAPBR: <cid>,<Status> OK If <cmd_type>=4 +SAPBR: <ConParamTag>,<ConParamValue> OK |
| Read Command AT+ SAPBR? | Response OK |
| Test Command AT+ SAPBR =? | Response OK |

Field

| Parameters | Description |
|-------------------------|---|
| <cmd_type> | 0 Close bearer 1 Open bearer 2 Query bearer 3 Set bearer parameters 4 Get bearer parameters |

| | |
|---|--|
| <cid> | Bearer profile identifier |
| <Status> | 0 Bearer is connecting 1 Bearer is connected 2 Bearer is closing 3 Bearer is closed |
| <ConParamTag> | "CONTYPE" Type of Internet connection. Value refer to ConParamValue_ConType |
| <ConParamValue_ConType> > | "APN" Access point name string: maximum 48 characters "USER" User name string: maximum 32 characters "PWD" Password string: maximum 32 characters "PHONENUM" Phone number for CSD call "RATE" CSD connection rate. For value refer to <ConParamValue_Rate> |
| <ConParamValue_Rate> | 0 2400 1 4800 2 9600 3 14400 |
| <IP_Addr> | The IP address of bearer |

Example:

| Commands | Response |
|-----------------------------------|-----------|
| at+sapbr=3,1,"apn","cmnet" | OK |
| at+sapbr=1,1 | OK |

22 Email AT commands

Overview of Email AT Commands:

| AT Command | Description |
|--------------------|---|
| AT+SMTPSRV | Set SMTP server address and port number |
| AT+SMTPAUTH | SMTP server authentication |
| AT+SMTPFROM | Set sender address and name |
| AT+SMTPRCPT | Set recipient type(TO/CC/BCC), address and name |
| AT+SMTPSUB | Set Email subject |
| AT+SMTPBODY | Set Email body |
| AT+SMTPBCH | Set Email body character set |
| AT+SMTPFILE | Add Email attachment file |
| AT+SMTPSEND | Send an Email |
| AT+SMTPSTOP | Close SMTP connection |
| AT+POP3SRV | Set POP3 server address, username, password, port |
| AT+POP3IN | Login POP3 server |
| AT+POP3NUM | Get Email number and total size |
| AT+POP3LIST | List Email ID and size |
| AT+POP3HDR | Get an Email header |
| AT+POP3GET | Get an Email |
| AT+POP3DEL | Mark an e-mail to delete from POP3 server |
| AT+POP3OUT | Logout POP3 server |
| AT+POP3STOP | Force to stop POP3 session |
| AT+POP3READ | Read an e-mail from file system |
| AT+EMAILENC | translate non-ASCII string to base64 |

Note: The support of these commands depend on firmware version.

22.1 AT+SMTPSRV Set SMTP server address and port number

The command is used to set SMTP server address and port number, then make DNS parse and connect to SMTP server. SMTP server address and port number will not be cleared until execute AT+SMTPSRV command with empty parameter. if you want to change address or port, execute AT+SMTPSTOP first.

| | |
|--|--|
| Test Command | Response |
| AT+SMTPSRV=? | +SMTPSRV: "",(1-65535),(1-3) OK |
| Read Command | Response |
| AT+SMTPSRV? | +SMTPSRV: <s_addr>,<n_port>,<n_type> OK |
| Write Command | Response |
| AT+SMTPSRV=<s_addr>,<n_port>,<n_type> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPSRV | OK / ERROR |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <s_addr> | Mandatory parameter. SMTP server address, non empty string with double quotes, ASCII text string up to 128 characters. |
| <n_port> | Mandatory parameter. Port number of SMTP server in decimal format, from 1 to 65535, and default port is 25 for SMTP. |
| <n_type> | Optional parameter. SMTP connect type. SMTP server: n_type=1 SMTP server with SSL/TLS: n_type=2 SMTP server with STARTTLS: n_type=3 |

Example:

| | |
|----------|----------|
| Commands | Response |
|----------|----------|

| | |
|---------------------------------------|---|
| AT+SMTPSRV=? | +SMTPSRV: "",(1-65535),(1-3) OK |
| AT+SMTPSRV="smtp.126.com",25,1 | 250-mail 250-PIPELINING 250-AUTH LOGIN PLAIN 250-AUTH=LOGIN PLAIN 250-coremail 1Uxr2xKj7kG0xkl17xGrU7I0s8FY2U3Uj8Cz28x1U UUUU7lc2I0Y2UFwxJ3zUCa0xDr UUUUj 250-STARTTLS 250 8BITMIME OK |
| AT+SMTPSRV? | +SMTPSRV: "smtp.126.com",25,1 OK |

22.2 AT+SMTPAUTH SMTP server authentication

The command is used to authenticate with SMTP server by correct authentication type, username, password. Authentication type, username, password will not be cleared until execute AT+SMTPAUTH command with empty parameter.

| | |
|----------------------|---|
| Test Command | Response |
| AT+SMTPAUTH=? | +SMTPAUTH: (0-3),"", "" OK |
| Read Command | Response |
| AT+SMTPAUTH? | +SMTPAUTH: <n_type>,<s_name>,<s_pass> OK |

| | |
|---|--|
| Write Command | Response |
| AT+SMTPAUTH=<n_type>,<s_name>,<s_pass> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPAUTH | OK / ERROR |
| | <p>Note</p> <p>If you want to change another type to authenticate with SMTP server, need to do the following:</p> <ol style="list-style-type: none"> 1. AT+SMTPSTOP 2. AT+SMTPSRV=<s_addr>[,<n_port>] 3. AT+SMTPAUTH=<n_type>,<s_name>,<s_pass> |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <n_type> | <p>Mandatory parameter. SMTP server authentication type, currently support below authentication types:</p> <p>AUTH LOGIN: n_type=0</p> <p>AUTH PLAIN: n_type=1</p> <p>AUTH NTLM: n_type=2</p> <p>AUTH CRAM_MD5: n_type=3</p> |
| <s_name> | <p>Mandatory parameter. Username to be used for SMTP authentication, non empty string with double quotes and up to 128 characters.</p> |
| <s_pass> | <p>Mandatory parameter. Password to be used for SMTP authentication, string with double quotes and up to 128 characters</p> |

Example:

| Commands | Response |
|--|---|
| AT+SMTPAUTH=? | +SMTPAUTH: (0-3),"", "" OK |
| AT+SMTPAUTH=0,"username","userpassword" | OK |

| | |
|---------------------|---|
| AT+SMTPAUTH? | +SMTPAUTH:0," username ","userpassword" OK |
|---------------------|---|

22.3 AT+SMTPFROM Set sender address and name

The command is used to set sender's address and name, which are used to construct e-mail header. Sender address and name will not be cleared until execute AT+SMTPFROM command with empty parameter.

| | |
|--|--|
| Test Command | Response |
| AT+SMTPFROM=? | +SMTPFROM: "", "" OK |
| Read Command | Response |
| AT+SMTPFROM? | +SMTPFROM: <s_addr>[,<s_name>] OK |
| Write Command | Response |
| AT+SMTPFROM=<s_addr>[,<s_name>] | OK / ERROR |
| Execute Command | Response |
| AT+SMTPFROM | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <s_addr> | Mandatory parameter. E-mail sender address, non empty string with double quotes, ASCII text up to 128 characters. |
| <s_name> | Optional parameter. E-mail sender name, string with double quotes, and alphanumeric ASCII text up to 64 characters. |

Example:

| | |
|----------------------|---------------------------------------|
| Commands | Response |
| AT+SMTPFROM=? | +SMTPFROM: "", "" OK |

| | |
|---|---|
| AT+SMTPFROM="sender@server.com","sendername" | OK |
| AT+SMTPFROM? | +SMTPFROM: "sender@server.com","sendername" OK |

22.4 AT+SMTPRCPT Set recipient type(TO/CC/BCC), address and name

The command is used to set recipient address/name and type (TO/CC/BCC). After an Email is sent, all recipient list will be cleared, or execute AT+SMTPRCPT with empty parameter can clear all recipient list.if the recipients is empty,return OK.

| | |
|--|--|
| Test Command | Response |
| AT+SMTPRCPT=? | +SMTPRCPT: (0-2),"", "" OK |
| Read Command | Response |
| AT+SMTPRCPT? | +SMTPRCPT: <n_type>,<s_addr> [,<s_name>] OK or OK |
| Write Command | Response |
| AT+SMTPRCPT=<n_type>,<s_addr> [,<s_name>] | OK / ERROR |
| Execute Command | Response |
| AT+SMTPRCPT | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|-----------------------|---|
| <n_type> | Mandatory parameter. Recipient type: TO: n_type=0 CC: n_type=1 BCC: n_type=2 |
| <s_addr> | Mandatory parameter. Recipient address, non empty string with double quotes, ASCII text up to 128 characters. |
| <s_name> | Optional parameter. Recipient name, string with double quotes, and alphanumeric ASCII text up to 64 characters. |

Example:

| Commands | Response |
|--|--|
| AT+SMTPRCPT=? | +SMTPRCPT: (0-2),""," OK |
| AT+SMTPRCPT=0,"rcptaddress_to@server.com","rcptname_to" | OK |
| AT+SMTPRCPT=1,"rcptaddress_cc@server.com","rcptname_cc" | OK |
| AT+SMTPRCPT=2,"rcptaddress_bcc@server.com","rcptname_bcc" | OK |
| AT+SMTPRCPT? | +SMTPRCPT: 0,"rcptaddress_to@server.com","rcptname_to" +SMTPRCPT: 1,"rcptaddress_cc@server.com","rcptname_cc" +SMTPRCPT: 2,"rcptaddress_bcc@server.com","rcptname_bcc" OK |

22.5 AT+SMTPSUB Set Email subject

The command is used to set the subject of e-mail, which is used to construct e-mail header. After an Email is sent, Email subject will be cleared, or execute AT+SMTPSUB with empty parameter can clear Email subject.

| | |
|--------------------------------------|---|
| Test Command | Response |
| AT+SMTPSUB=? | +SMTPSUB: "" OK |
| Read Command | Response |
| AT+SMTPSUB? | +SMTPSUB: <s_subject> OK |
| Write Command | Response |
| AT+SMTPSUB=< s_subject> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPSUB | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---|
| <s_ subject> | Mandatory parameter. Email subject, string with double quotes, and ASCII text up to 512 characters. Currently, it only support ASCII code characters. |

Example:

| | |
|--|----------------------------------|
| Commands | Response |
| AT+SMTPSUB=? | +SMTPSUB: "" OK |
| AT+SMTPSUB="smtp email test 0412" | OK |

| | |
|--------------------|--|
| AT+SMTPSUB? | +SMTPSUB: " smtp email test 0412" |
| | OK |

22.6 AT+SMTPBODY Set Email body

The command is used to set the body of e-mail, After an Email is sent, Email body will be cleared, execute AT+SMTPBODY will switch the serial port from command mode to data mode, so TE can enter more ASCII text as e-mail body (up to 1024), and CTRL-Z (ESC) is used to finish (cancel) the input operation and switch the serial port back to command mode. Execute command can input non-ASCII character string, and display ">", the prevent body will be cleared.

| | |
|-----------------------------------|---|
| Test Command | Response |
| AT+SMTPBODY=? | +SMTPBODY: "" OK |
| Read Command | Response |
| AT+SMTPBODY? | +SMTPBODY: <s_body> OK |
| Write Command | Response |
| AT+SMTPBODY=<s_body> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPBODY | > OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <s_body> | Mandatory parameter. E-mail body, string with double quotes, and ASCII text up to 1024 characters. Currently, it only support ASCII code characters. |

Example:

| Commands | Response |
|---|-----------------------------------|
| AT+SMTPBODY=? | +SMTPBODY: "" OK |
| AT+SMTPBODY="this is an email test body" | OK |
| AT+SMTPBODY? +SMTPBODY: "this is an email test body" | OK |
| AT+SMTPBODY | >邮件内容中文测试 OK |

22.7 AT+SMTPBCH Set Email body character set

The command is used to set the body character set of e-mail. Execute command will set Email body character set to default. This command checks the correctness of the encoding. If the input is wrong, default "utf-8".

| Test Command | Response |
|---------------------------------|---|
| AT+SMTPBCH=? | +SMTPBCH: "" OK |
| Read Command | Response |
| AT+SMTPBCH? | +SMTPBCH: <s_bch> OK |
| Write Command | Response |
| AT+SMTPBCH=<s_bch> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPBCH | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <s_bch> | Mandatory parameter. Email body character set, string with double quotes. By default, it is "utf-8". The maximum length is 32 bytes. <s_bch> support the following char-sets |

Example:

| Commands | Response |
|----------------------------|-----------|
| AT+SMTPBCH="gb2312" | OK |

22.8 AT+SMTPFILE Add Email attachment file

The command is used to add Email attachment files. After an Email is sent, all attachment files will be cleared, or clear all attachment file list by execute AT+SMTPFILE with empty parameter. if the attachment is empty, return OK.

| | |
|---|---|
| Test Command | Response |
| AT+SMTPFILE=? | +SMTPFILE: (1-10),"" OK |
| Read Command | Response |
| AT+SMTPFILE? | +SMTPFILE: <n_index>,<s_filename> OK or OK |
| Write Command | Response |
| AT+SMTPFILE=<n_index>,<s_filename> | OK / ERROR |
| Execute Command | Response |
| AT+SMTPFILE | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---|
| <n_index> | Mandatory parameter. Index for attachment files, from 1 to 10. |
| <s_filename> | Mandatory parameter. String type with double quotes, the name of a file which is under current directory. SMTP client doesn't allow two attachments with the same file name. The total size of all attachments can't exceed 10MB. |

Example:

| Commands | Response |
|---|--|
| AT+SMTPFILE=? | +SMTPFILE: (1-10),"" OK |
| AT+SMTPFILE=1,"Z:\email\parsed\Email20160412030509000.txt" | OK |
| AT+SMTPFILE=2,"Z:\email\parsed\Email20160412030539000.txt" | OK |
| AT+SMTPFILE? | +SMTPFILE: "Z:\email\parsed\Email20160412030509000.txt" +SMTPFILE:" Z:\email\parsed\Email20160412030539000.txt " OK |

22.9 AT+SMTPSEND Send an Email

The command is used to send an Email to SMTP server after all mandatory parameters have been set correctly.

| Test Command | Response |
|----------------------|-------------------|
| AT+SMTPSEND=? | OK |
| Execute Command | Response |
| AT+SMTPSEND | OK / ERROR |
| | Note |

Parameters are defined below:

NONE

22.10 AT+SMTPSTOP Close SMTP connection

The command is used to close SMTP connection.

| | |
|----------------------|-------------------|
| Test Command | Response |
| AT+SMTPSTOP=? | OK |
| Execute Command | Response |
| AT+SMTPSTOP | OK / ERROR |
| | Note |

Parameters are defined below:

NONE

22.11 AT+POP3SRV Set POP3 server address, username, password, port

The command is used to set POP3 server address, username, password, port number. All parameters will not be cleared until execute AT+POP3SRV command with empty parameter.

| | |
|---|---|
| Test Command | Response |
| AT+POP3SRV=? | +POP3SRV: "", "", "", (1-65535) OK |
| Read Command | Response |
| AT+POP3SRV? | +POP3SRV: <s_server>,<s_username>,<s_password>[,<n_port>] OK |
| Write Command | Response |
| AT+POP3SRV=<s_server>,<s_username>,<s_password>[,<n_port>] | OK / ERROR |
| Execute Command | Response |
| AT+POP3SRV | OK / ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------------|--|
| <s_server> | Mandatory parameter. POP3 server address, non empty string with double quotes, ASCII text string up to 128 characters. |
| <s_username> | Mandatory parameter. Username to log in POP3 server, non empty string with double quotes, and up to 128 characters. |
| <s_password> | Mandatory parameter. Password to log in POP3 server, string with double quotes, and up to 128 characters. |
| <n_port> | <n_port> - Optional parameter. Port number of POP3 server in decimal format, from 1 to 65535, and default port is 110 for POP3. |

Example:

| Commands | Response |
|--|--|
| AT+POP3SRV=? | +POP3SRV: "", "", "", (1-65535) OK |
| AT+POP3SRV="pop3.server.com", "username", "password", 110 | OK |
| AT+POP3SRV? | +POP3SRV: "pop3.server.com", "username", "password", 110 OK |

22.12 AT+POP3IN Login POP3 server

The command is used to login POP3 server and establish a session after POP3 server and account information are set rightly. if no POP3 operation for a long time after the session is ready, POP3 server may release the session.

| Test Command | Response |
|--------------------|-------------------|
| AT+POP3IN=? | OK |
| Execute Command | Response |
| AT+POP3IN | OK / ERROR |
| | Note |

22.13 AT+POP3NUM Get Email number and total size

The command is used to get e-mail number and total size on the specified POP3 server after the POP3 client logs in POP3 server successfully.<num> is the e-mail number on the POP3 server, <tsize> is the total size of all e-mail and the unit is in Byte.

| | |
|---------------------|---|
| Test Command | Response |
| AT+POP3NUM=? | OK |
| Execute Command | Response |
| AT+POP3NUM | +OK 6 26706 OK / ERROR |
| | Note |

Parameters are defined below:

NONE

22.14 AT+POP3LIST List Email ID and size

The command is used to get e-mail number and size on the specified POP3 server after the POP3 client logs in POP3 server successfully.<size> is the size of e-mail <msg_id> and the unit is in Byte. <num> is the e-mail number on the POP3 server, <tsize> is the total size of all e-mail and the unit is in Byte.

| | |
|--------------------------------------|---|
| Test Command | Response |
| AT+POP3LIST=? | +POP3LIST: (1-65535) OK |
| Write Command | Response |
| AT+POP3LIST=[<n_msgID>] | +POP3LIST: +OK<n_msgID>, <size> OK ERROR |

| | |
|---------------------------------------|---|
| Execute Command AT+POP3LIST | Response +POP3LIST: +OK <num>, <tsize> [<msg_id><size> [<CR><LF>...]] . OK or ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|------------------------|-----------------------------------|
| <n_msgID> | Optional parameter. The Email ID. |

Example:

| Commands | Response |
|----------------------|---|
| AT+POP3LIST | +POP3LIST: +OK 5 127120 1 1812 2 3053 3 13257 4 3577 5 44833 . OK |
| AT+POP3LIST=1 | +POP3LIST: +OK 1 1812 OK |

22.15 AT+POP3HDR Get an Email header

The command is used to retrieve e-mail's sender address, date and sender address, which are present in the mail's header.

| | |
|-------------------------------------|--|
| Test Command | Response |
| AT+POP3HDR=? | +POP3HDR: (1-65535) OK |
| Write Command | Response |
| AT+POP3HDR=[<n_msgID>] | date: [<date>] from: [<from>] subject: [<sub>] OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------------|-----------------------------------|
| <n_msgID> | Optional parameter. The Email ID. |

Example:

| | |
|---------------------|--|
| Commands | Response |
| AT+POP3HDR=? | +POP3HDR: (1-65535) OK |
| AT+POP3HDR=1 | date: Tue, 15 Mar 2016 14:50:01 +0800 from: lee <lee@163.com> subject: Re: this is a test email from xxxx in r1523 OK |

22.16 AT+POP3GET Get an Email

The command is used to retrieve an Email from server and save it to local file system.

| | |
|---|---|
| Test Command | Response |
| AT+POP3GET=? | +POP3GET: (1-65535),(1-2) OK |
| Write Command | Response |
| AT+POP3GET=<n_msgID>[,<n_gettype>] | Received file path Parsed file path OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|--------------------------|---|
| <n_msgID> | Optional parameter. The Email ID. |
| <n_gettype> | Optional parameter. The type to save when getting message from POP3 server: -Save parsed body file and attachments: n_gettype=1 -Save the whole message as a ".eml" file: n_gettype=2 |

Example:

| | |
|---------------------|--|
| Commands | Response |
| AT+POP3GET=1 | Z:\email\received\Email20160412014342.txt Z:\email\parsed\Email20160412014342000.txt OK |

22.17 AT+POP3DEL Mark an e-mail to delete from POP3 server

The command is used to mark an e-mail to delete from POP3 server. The operation only marks an e-mail on the server to delete it, and after POP3 client stop connect POP3 server, the marked e-mail is deleted on the server.

| | |
|---------------------|---|
| Test Command | Response |
| AT+POP3DEL=? | +POP3DEL: (1-65535) OK |

| | |
|-----------------------------------|---------------------------------|
| Write Command | Response |
| AT+POP3DEL=<n_msgID> | OK or ERROR |

Parameters are defined below:

| Parameters | Description |
|------------------------|-----------------------------------|
| <n_msgID> | Optional parameter. The Email ID. |

Example:

| | |
|---------------------|-----------|
| Commands | Response |
| AT+POP3DEL=5 | OK |

22.18 AT+POP3OUT Logout POP3 server

The command is used to log out the POP3 server and close the session, and if there are some e-mails which are marked to delete, it also informs POP3 server to delete the marked e-mails.

| | |
|---------------------|-------------------|
| Test Command | Response |
| AT+POP3OUT=? | OK |
| Execute Command | Response |
| AT+POP3OUT | OK / ERROR |
| | Note |

Parameters are defined below:

NONE

22.19 AT+POP3STOP Force to stop POP3 session

The command is used to force to close the session, and if there are some e-mails which are marked to delete, it also informs POP3 server to delete the marked e-mails.

| | |
|----------------------|-------------------|
| Test Command | Response |
| AT+POP3STOP=? | OK |
| Execute Command | Response |
| AT+POP3STOP | OK / ERROR |
| | Note |

Parameters are defined below:

NONE

22.20 AT+POP3READ Read an e-mail from file system

The command is used to read an e-mail from file system.<e-mail> is the content of e-mail, including e-mail header and body, but now can only support display 1024 characters.

| | |
|--|--|
| Test Command | Response |
| AT+POP3READ=? | +POP3READ: (0-1),"",(0-65535),(1-1024) OK |
| Read Command | Response |
| AT+POP3READ? | +POP3READ: <n_location>,<s_filename>[,<n_startpos>,<n_size>] OK or ERROR |
| Write Command | Response |
| AT+POP3READ=<n_location>,<s_filename>[,<n_startpos>,<n_size>] | <e-mail> OK or ERROR |
| Execute Command | Response |
| AT+POP3READ | OK or ERROR |
| | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------------|---|
| <n_location> | Mandatory parameter. The location from which TE reads an e-mail. Currently, only support Local system. -Local system: n_location=0 -SD card: n_location=1 |
| <s_filename> | Mandatory parameter. The Email file name, string type with double quotes and including a directory name and a text file name separated by the list separator "\". |
| <n_startpos> | Optional parameter. The start position of the file to read. |
| <n_size> | -Optional parameter. The num of bytes to read from file. This Parameter is not large than 1024. |

Example:

| Commands | Response |
|--|--|
| AT+POP3READ=0,"Z:\email\received\Email20160412015207.txt",0,512 | +OK 4204 octets Received: from m97135.qiye.163.com (unknown [220.181.97.135]) by mx6 (Coremail) with SMTP id JmmowABnXha4XAtXt3GaAA--.1945S2; Mon, 11 Apr 2016 16:13:44 +0800 (CST) Received: from Windows-Build3 (unknown [182.150.28.206]) by smtp1 (C OK |
| AT+POP3READ? | +POP3READ: 0," Z:\email\received\Email20160412015207.txt ",0,512 OK |

22.21 Email AT command response code definition

| Response code | Definition |
|---------------|---------------------------|
| 0 | Email operation succeeded |

| | |
|-----|------------------------------------|
| 1 | System busy |
| 2 | Email over size |
| 3 | Attachment duplicate file |
| 4 | Email operation time out |
| 5 | Email transfer failed |
| 6 | Memory error |
| 7 | Email invalid parameter |
| 8 | Network error |
| 9 | EFS operation error |
| 10 | Email server error |
| 11 | Email authentication failed |
| 13 | Email is downloading |
| 14 | SMTP is sending or requesting data |
| 15 | SMTP already login |
| 16 | Get hostname failed |
| 255 | Unknown error |
| 0 | Email operation succeeded |

23 TTS AT Commands

Overview of TTS AT Commands:

| AT Command | Description |
|---------------------|-----------------------------------|
| AT+CTTS | TTS Operation |
| AT+CTTSPARAM | Set Parameters of the TTS Playing |

Note: The support of these commands depend on firmware version.

23.1 AT+CTTS TTS Operation

The command is used to broadcast text .

| | |
|--|---|
| Test Command | Response |
| AT+CTTS=? | OK |
| Write Command | Response |
| AT+CTTS=<mode>[,<text>] | If<mode>=0,response OK If<mode>=1or2,response: OK +CTTS:0 //speech player over If error is related to MS functionality, response: +CME ERROR:<err> |
| Reference | Note <input type="checkbox"/> Call setup will stop the current tts play <input type="checkbox"/> TTS can play in call, but call release will stop the tts play <input type="checkbox"/> TTS play is not allowed when alert or ring The feature is supported by L216 only. |

| Parameters | Description |
|---------------------|--|
| <mode> | 0 stop broadcast speech 1 Start to play synthetic speech, <text> is in UCS2 coding format 2 Start to play synthetic speech, <text> is in ASCII coding format Chinese text is in GBK coding format |
| <text> | The text which is synthesized to speech to be played, maximum data length is 2000 Bytes |

23.2 AT+CTTSPARAM Set Parameters of the TTS Playing

Set Parameters of the TTS Playing.

| | |
|---|---|
| Test Command | Response |
| AT+CTTSPARAM=? | +CTTSPARAM: (1-100),(0-3),(1-100),(1-100),(0,1) OK |
| Read Command | Response |
| AT+CTTSPARAM? | +CTTSPARAM: <volume>,<mode>,<pitch>,<speed>,<channel> OK |
| Write Command | Response |
| AT+CTTSPARAM=<volume>,<mode>,<pitch>,<speed>[,<channel>] | OK If error is related to MS functionality, response: +CME ERROR: <err> |
| Reference | Note TTS play channel setting take no effect in call. TTS play channel depend on CHFA when in call. The default value of parameter <channel> is different among SIM800 series projects, please refer to chapter 21 for details. The feature is supported by L216 only |

| Parameters | Description |
|------------|-------------|
|------------|-------------|

| | |
|------------------------|--|
| <volume> | TTS playing volume, the range is 0-100,the default is <u>100</u> |
| <mode> | 0 auto read digit, and read digit based on number rule first 1 auto read digit, and read digit based on telegram rule first 2 read digit based on telegram rule 3 read digit based on number rule |
| <pitch> | TTS playing pitch, the range is 1-100,the default is <u>100</u> . |
| <speed> | TTS playing speed, the range is 1-100,the default is <u>50</u> |
| <channel> | <u>0</u> main channel 1 aux channel Parameter Saving |

24 LBS AT Commands

Overview of LBS AT Commands:

| AT Command | Description |
|-----------------|-------------|
| AT+GTPOS | Get LBS |

Note: The support of these commands depend on firmware version.

24.1 AT+GTPOS Get LBS

Get the base station location information

| | |
|------------------------------|--|
| Test Command | Response |
| AT+GTPOS=? | OK |
| Write Command | Response |
| AT+GTPOS=<mode> | mode=0 CLOSE OK/ERROR mode=1 OK CONNECT OK or ERROR mode=2 +GTPOS: Longitude, Latitude,value\$ OK or ERROR |
| Execution Command | Response |
| AT+GTPOS | +GTPOS: Longitude, Latitude,value\$ OK OR +GTPOS: <status> OK |
| Reference | Note: using LBS will take up a network channel, if you use the TCPIP protocol, please pay attention do not use the same channel; default LBS use channel 7 |

WIFI hot spot positioning function

| | |
|--|---|
| Write Command | Response |
| AT+GTPOS=3,"BSSID1,RSSI1[,BSSID2,RSSI2[,BSSID3,RSSI3]]" | +GTPOS: Longitude, Latitude,value\$ OK |
| Reference | Note Requires 1-3 different WIFI hotspot information |

| Parameters | Description |
|--------------------------|---|
| <Longitude> | string type Longitude |
| <Latitude> | string type Latitude |
| <value\$> | Parity bit; odd parity check, the current number of odd numbers is even return 0, odd number is 1 |
| <mode> | 0: closed LBS funtion 1: open LBS function 2: get LBS information 3: access to WIFI base station location information |
| <BSSID> | WIFI hotspot MAC address (12 bits) |
| <RSSI> | Signal intensity (dbm) |
| <status> | -1 : Network busy -2: LBS not ready -3:Network error -4: Network timeout -5:Network unack -6: Network EXISTS -7: WIFI information error -8: DNS domain error |

Example 1

| Command | Result |
|------------------------|--|
| AT+CGREG? | +CGREG: 0,1 OK |
| AT+CSTT="CMNET" | OK |
| AT+CIICR | 10.85.182.45 OK |
| AT+GTPOS | +GTPOS: 121.3955545,31.1560099,0\$ OK |

| | |
|-------------------|-----------|
| AT+CIPSHUT | OK |
|-------------------|-----------|

Example 2

| Command | Result |
|------------------------|--|
| AT+CGREG? | +CGREG: 0,1 OK |
| AT+CSTT="CMNET" | OK |
| AT+CIICR | 10.85.182.45 OK |
| AT+GTPOS=1 | OK CONNECT OK |
| AT+GTPOS=2 | +GTPOS: 121.396055,31.162621,0\$ OK |
| AT+CIPSHUT | OK |

Example 3

| Command | Result |
|--------------------------------------|--|
| AT+CGREG? | +CGREG: 0,1 OK |
| AT+CSTT="CMNET" | OK |
| AT+CIICR | 10.85.182.45 OK |
| AT+GTPOS=1 | OK CONNECT OK |
| AT+GTPOS=3,"5c63bfd259d2,-75" | +GTPOS: 121.3957115,31.1625643,0\$ OK |
| AT+CIPSHUT | OK |

25 Charge AT Commands

Overview of Charge AT Commands:

| AT Command | Description |
|-----------------------|-----------------------------------|
| AT+MCHRCBC | Query the current battery voltage |
| AT+MCHRCURRENT | Charging status |
| AT+MCHRSTATUS | Charging status |
| AT+MCHRTIME | Charging time remaining |

Note:

- 1.The support of these commands depend on firmware version.
2. Only L216(E) module support these Charge Commands.(L218 not support these commands)

25.1 AT+MCHRCBC Query the current battery voltage

This command is used to query the current battery voltage.

| | |
|---------------------|--|
| Test Command | Response |
| AT+MCHRCBC=? | OK |
| Read Command | Response |
| AT+ MCHRCBC? | + MCHRCBC: <voltage> OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|------------------------|---|
| <voltage> | The size of the battery voltage UNIT: uV |

25.2 AT+MCHRCURRENT Charging current operation

This command is used to charging current operation.

| | |
|-------------------------|---|
| Test Command | Response |
| AT+MCHRCURRENT=? | OK |
| Read Command | Response |
| AT+ MCHRCURRENT? | +MCHRCURRENT: <current> OK or Error |
| Reference | Note |

Parameters are defined below:

| | |
|------------------------|---|
| Parameters | Description |
| <current> | The size of charging current. UNIT: uA |

25.3 AT+MCHRSTATUS Charging status

This command is used to track the status of charging.

| | |
|------------------------|-----------|
| Test Command | Response |
| AT+MCHRSTATUS=? | OK |

| | |
|------------------------|-------------------------------------|
| Read Command | Response |
| AT+ MCHRSTATUS? | + MCHRSTATUS: <status> |
| | OK |
| | or |
| | Error |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|---|
| <status> | The status of charging. CHR_PRE pre-charge status CHR_FAST fast charging status CHR_TOPOFF top-off status vbat=4.1v CHR_BATFULL bat full vbat=4.16v CHR_ERROR charging error |

25.4 AT+MCHRTIME Charging time remaining

This command is used to query the remaining charging time.

| | |
|----------------------|-----------|
| Test Command | Response |
| AT+MCHRTIME=? | OK |

| | |
|-----------------------------------|---|
| Read Command | Response |
| AT+ MCHRTIME? | + MCHRTIME: <time>,<volume> OK Or Error |
| Execution Command | Response |
| AT+MCHRTIME=<volume> | OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <time> | Charging time remaining UNIT: seconds |
| <volume> | Battery capacity UNIT: uAh |

26 File System AT command

Overview of file system AT Commands:

| AT Command | Description |
|----------------------|---|
| AT+FSCREATE | Create a File |
| AT+FSWRITE | Write data to file |
| AT+FSWRITEHEX | Write HEX data to file |
| AT+FSREAD | Read File content |
| AT+FSREADHEX | Read File content in HEX format |
| AT+FSSIZE | Get File size |
| AT+FSMKDIR | Create directory |
| AT+FSRMDIR | Remove directory |
| AT+FSLS | List File or directory |
| AT+FSDEL | Delete a File |
| AT+FSINFO | Get Disk Free Space Information |
| AT+FSPLAY | This command is used to play Audio file in call (AMR format) |
| AT+FSSTOP | This command is used to stop play Audio file in call (AMR format) |

Note: The support of these commands depend on firmware version.

26.1 AT+FSCREATE Create a File

This command is used to create a File.

| | |
|---------------------------------|--------------|
| Test Command | Response |
| AT+FSCREATE=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSCREATE=<file> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |

Example :

| Commands | Response |
|-----------------------------------|-----------|
| AT+FSCREATE="file.txt" | OK |
| AT+FSCREATE="/ni/file.txt" | OK |

26.2 AT+FSWRITE Write data to file

This command is used to Write data to file.

| | |
|--|--------------|
| Test Command | Response |
| AT+FSWRITE=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSWRITE=<file>,<mode>,<size> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <mode> | 0 Write to the start of the file 1 append to the end of the file |
| <size> | 1-1024 Size of data to be written |

Example :

| Commands | Response |
|-------------------------------------|-------------|
| AT+FSWRITE=" file.txt",1,512 | > |
| (input data) | OK |

26.3 AT+FSWRITEHEX Write HEX data to file

This command is used to Write HEX data to file.

| | |
|---|--------------|
| Test Command | Response |
| AT+FSWRITEHEX=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSWRITEHEX=<file>,<mode>,<size> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <mode> | 0 Write to the start of the file (no effect) 1 append to the end of the file (support this only until now) |
| <size> | 1-1024 Size of HEX data to be written (double size of write bin data) |

Example :

| Commands | Response |
|--|-------------|
| AT+FSWRITEHEX="USER/1.amr",1,4 | > |
| (input HEX data, For example: 3132) | OK |

26.4 AT+FSREAD Read File content

This command is used to read File content.

| | |
|---|--------------|
| Test Command | Response |
| AT+FSREAD=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSREAD=<file>,<offset>,<size> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <offset> | 0-65536 offset from the file beginning. |
| <size> | 1-1024 Size of data to be read |

For example :

| | |
|------------------------------|---------------------------------|
| Commands | Response |
| AT+FSREAD="1.txt",0,5 |(data) OK |

26.5 AT+FSREADHEX Read File content in HEX format

This command is used to read File content in HEX format.

| | |
|--|--------------|
| Test Command | Response |
| AT+FSREADHEX=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSREADHEX=<file>,<offset>,<size> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|-----------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <offset> | 0-65536 offset from the file beginning. |
| <size> | 1-1024 Size of data to be read |

For example :

| | |
|---------------------------------|--------------------------------|
| Commands | Response |
| AT+FSREADHEX="1.txt",0,5 | 3131333435 OK |

26.6 AT+FSSIZE Get File size

This command is used to get file size.

| | |
|-------------------------------|---------------------|
| Test Command | Response |
| AT+FSSIZE=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSSIZE=<file> | <size> |
| | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <size> | File size. |

Example :

| Commands | Response |
|------------------------------|-----------|
| AT+FSSIZE="/test.txt" | 10 |
| | OK |

26.7 AT+FSMKDIR Create directory

This command is used to create directory.

| | |
|-------------------------------|--------------|
| Test Command | Response |
| AT+FSMKDIR=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSMKDIR=<dir> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------|--|
| <dir> | A String with double quotes. The string length of <file> should be less than 64 bytes. |

Example :

| Commands | Response |
|--------------------------|-----------|
| AT+FSMKDIR="USER" | OK |

26.8 AT+FSRMDIR Remove directory

This command is used to remove directory.

| | |
|-------------------------------|--------------|
| Test Command | Response |
| AT+FSRMDIR=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSRMDIR=<dir> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------|---|
| <dir> | A String with double quotes. The string length of <dir> should be less than 64 bytes. (Note: this directory must be empty.) |

Example :

| Commands | Response |
|--------------------------|-----------|
| AT+FSRMDIR="USER" | OK |

26.9 AT+FSLS List File or directory

This command is used to list file or directory.

| | |
|----------------------------------|----------------------------------|
| Test Command | Response |
| AT+FSLS=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSLS=<directory> | <file or directory> |
| | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------------------|--|
| <directory> | A String with double quotes. The string length of <file> should be less than 64 bytes. |
| <file or directory> | A String without double quotes. |

For example :

| Commands | Response |
|--------------------|--|
| AT+FSLS="/" | @pbapc @pbap file.txt NVRAM USER OK |

AT+FSLS="USER"

.

..

file1.txt

file2.txt

file3.txt

OK

LYNQ
CONFIDENTIAL

26.10 AT+FSDEL Delete a File

This command is used to delete a File.

| | |
|------------------------------|--------------|
| Test Command | Response |
| AT+FSDEL=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSDEL=<file> | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|---------------------|--|
| <file> | A String with double quotes. The string length of <file> should be less than 64 bytes. |

Example :

| Commands | Response |
|----------------------------|-----------|
| AT+FSDEL="file.txt" | OK |

26.11 AT+FSINFO Get Disk Free Space Information

This command is used to get disk space information.

| | |
|--------------------------------|---------------------|
| Test Command | Response |
| AT+FSINFO=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+FSINFO=<drive> | <size> |
| | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|---|
| <drive> | A String with double quotes. The string length of <drive> should be less than 64 bytes. |

Example:

| Commands | Response |
|-----------------------|---------------|
| AT+FSINFO="Z:" | 337408 |
| | OK |

26.12 AT+FSPLAY Play Audio file in call (AMR format)

This command is used to play Audio file in call (AMR format).

| | |
|--|--|
| Test Command | Response |
| AT+FSPLAY=? | +FSPLAY: "file path",(0-3) OK |
| Write Command | Response |
| AT+FSPLAY=<file>,<mode> | +FSPLAY: <file>,<mode> OK Or ERROR |
| Reference | Note 1. Use "AT+FSPLAY" active command will reset <mode> to 0. |

Parameters are defined below:

| Parameters | Description |
|---------------------|---|
| <file> | A String with double quotes. The string length of <file> should be less than or equal to 64 bytes. |
| <mode> | 0 Play manually in call status. (only in call status will response OK) 1 Play in mobile terminal call status (MT). 2 Play in mobile original call status (MO). 3 Play in MT/MO calls both. |

Example:

| Commands | Response |
|--------------------------------|-----------|
| AT+FSPLAY="/22.amr",3 | OK |
| AT+FSPLAY="22.amr",3 | OK |
| AT+FSPLAY="Z:/12.amr",3 | OK |

26.13 AT+FSSTOP Stop Play Audio file in call (AMR format)

This command is used to stop Audio file in call (AMR format).

| | |
|------------------------------------|---|
| Test Command | Response |
| AT+FSSTOP=? | OK |
| Action Command AT+FSSTOP | Response OK Or ERROR |
| Reference | Note |

27 Jamming Detection

27.1 AT+MJDR Jamming Detection Report

Jamming Detection can be activated by MJDR command. Parameters will be automatically saved into NVRAM after they are configured successfully.

| | |
|-------------------------------|--|
| Test Command | Response |
| AT+MJDR=? | +MJDR: (0,1) OK |
| Read Command | Response |
| AT+ MJDR? | +MJDR: NO JAMMING,<value> OK or +MJDR: JAMMED,<value> OK |
| Write Command | Response |
| AT+ MJDR=<value> | OK |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|----------------------|--|
| <value> | 0 Jamming Detection function is disabled (factory default is 0). 1 Jamming Detection function is enabled. |

27.2 AT+MJDCFG Jamming Detection Configuration

This command allows module to configure the options of Jamming Detection feature. These options include the Jamming Detection's conditions, the Jamming notification methods, etc. Parameters will be automatically saved into NVRAM after they are configured successfully.

| | |
|---|--|
| Test Command | Response |
| AT+MJDCFG=? | +MJDCFG:("URC","PERIOD","PIN","MNL","MINCH"),(value) OK |
| Read Command | Response |
| AT+ MJDCFG? | +MJDCFG: "URC",<urcenable> +MJDCFG: "PERIOD",<period> +MJDCFG: "PIN",<pinname> +MJDCFG: "MNL",<mnl> +MJDCFG: "MINCH",<minch> OK |
| Write Command | Response |
| Jamming Detection will be configured to report jamming status via URC through serial port | OK Or ERROR |
| AT+MJDCFG="urc",<urcenable> | |
| Write Command | Note |
| Jamming Detection will be configured to report jamming status via URC periodically through serial port. | OK Or ERROR |
| AT+ MJDCFG="period",<period> | |

| | |
|--|-------------------|
| Jamming Detection will be configured to report jamming status via the PIN. | OK Or ERROR |
| AT+MJDCFG="pin",<pinname> | ERROR |
| Maximum Received Signal Strength | OK Or ERROR |
| AT+MJDCFG="mnl",<mnl> | ERROR |
| Disturbed Channel Minimum Number. | OK Or ERROR |
| AT+MJDCFG="minch",<minch> | ERROR |

Parameters are defined below:

| Parameters | Description |
|--------------------------|--|
| <urcenable> | Configure whether to report Jamming status via URC. 0 Disable status reporting via URC through serial port. 1 Enable status reporting via URC through serial port. |
| <period> | Configure whether to report Jamming status via URC periodically. 0 Disable Jamming status reporting via URC periodically. 1-N Report Jamming status via URC every <period> seconds. |
| <pinname> | This is a string type parameter to configure which pin is used to report jamming status. (Don't need to modify) "_" Disable the function of jamming status reporting via a pin. |
| <mnl> | Maximum Received Signal Strength. (Don't need to modify) 0-17-31 |
| <minch> | Disturbed Channel Minimum Number. (Don't need to modify) 0-5-254 |

Example:

| Commands | Response |
|-----------------------------|----------|
| AT+MJDCFG="URC",1 | OK |
| AT+MJDCFG="period",1 | OK |

AT+MJDR=1**OK**

//如果此时有检测到干扰

+MJDR: JAMMED //间隔时间是"period"**+MJDR: JAMMED****+MJDR: JAMMED****+MJDR: JAMMED****+MJDR: JAMMED****+MJDR: JAMMED****+MJDR: JAMMED**

28 ESIM Commands

Overview of file ESIM AT Commands:

| AT Command | Description |
|----------------|-------------------------------------|
| AT+CGLA | Generic UICC logical channel access |
| AT+CCHO | Open logical channel |
| AT+CCHC | Close logical channel |

Note: The support of these commands depend on firmware version.

28.1 AT+CGLA Generic UICC logical channel access

Set command transmits to the MT the <command> it then shall send as it is to the selected UICC.

In the same manner the UICC <response> shall be sent back by the MT to the TA as it is. This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.

Moreover, for security reason the GSM network authentication should not be handled outside the TA/MT. Therefore it shall not be allowed to execute a Run GSM Algorithm command or an Authenticate command in GSM context from the TE using +CGLA at all time whether the +CGLA is locked or unlocked.

| | |
|--|---|
| Test Command | Response |
| AT+CGLA=? | OK Or ERROR |
| Write Command | Response |
| AT+CGLA=<sessionid>,<length>,<com mand> | +CGLA: <length>,<response> Or ERROR |
| Reference | Note |

Parameters are defined below:

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

28.2 AT+CCHO Open logical channel

Execution of the command causes the MT to return <sessionid> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the <dfname> received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel.

This <sessionid> is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands.

NOTE: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly

contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.

| | |
|--------------------------------|--------------------------|
| Test Command | Response |
| AT+CCHO=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+ CCHO=<dfname> | <sessionid> |
| | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------------|--|
| <dfname> | All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes |
| <sessionid> | integer type A session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism |

28.3 AT+CCHC Close logical channel

This command asks the ME to close a communication session with the active UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command.

| | |
|-------------------------------------|--------------|
| Test Command | Response |
| AT+CCHC=? | OK |
| | Or |
| | ERROR |
| Write Command | Response |
| AT+ CCHC=< sessionid > | OK |
| | Or |
| | ERROR |
| Reference | Note |

Parameters are defined below:

| Parameters | Description |
|--------------------------|---|
| <sessionid> | integer type A session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM,WIM, ISIM) using logical channels mechanism |

Example

| AT Command | Response |
|---|-----------------|
| AT+CCHO="A0000000871002FF86FFFF89FFFFFFFF" | 1 |
| | OK |
| AT+CGLA=1,26,"0120000A083030303030303030" | , "9000" |
| | OK |
| AT+CCHC=1 | OK |

29 Annex

| Parameters | Description |
|------------|--|
| <s_bch> | <p>Mandatory parameter. Email body character set, string with double quotes. By default, it is "utf-8". The maximum length is 32 bytes. support the following char-sets:</p> <p>"GB2312","GBK","GB18030","GB_2312-80","GB_1988-80","UCS-2","UTF-32","UTF-8","UCS-4","GREEK8","KOREAN","JP","SHIFT-JIS","CN-GB","HZ-GB-2312","EUC-TW","BIGFIVE","BIG5-HKSCS","BIG-FIVE","BIG5-HKSCS:2001","BIG5-HKSCS:2008","BIG5-HKSCS:1999","BIG5-HKSCS:2004","SJIS","CN","CP1131","CP1361","866","CP1133","CP1251","CP866","CP1256","862","CP1253","CP936","CP1255","CP862","CP1252","C99","CP932","CP1258","CP819","L1","L6","L3","L5","L2","L8","EUCCN","ISO8859-1","ISO8859-11","ISO8859-6","ISO8859-16","ISO8859-3","ISO8859-13","ISO8859-5","ISO8859-15","ISO8859-2","EUC-CN","ISO8859-8","ISO-8859-1","ISO-8859-11","ISO-8859-6","ISO-8859-16","ISO-8859-3","ISO-8859-13","ISO8859-9","ISO-8859-5","ISO-8859-15","ISO-8859-2","ISO646-CN","R8","L4","ISO-8859-8","CP949","ISO_8859-1","ISO_8859-11","ISO_8859-6","ISO_8859-16","ISO_8859-3","ISO_8859-13","ISO-8859-9","ISO_8859-5","ISO_8859-15","ISO_8859-2","LATIN1","LATIN6","CP154","LATIN3","ISO_8859-8","ISO_8859-15:1998","LATIN5","CP1254","LATIN2","CSISO2022CN","ISO_8859-9","CHINESE","ISO-IR-6","LATIN8","ASCII","ISO-IR-166","X0212","VISCII","ISO-IR-126","CSASCII","ISO-IR-165","CSVISCII","ISO-IR-226","MAC","ISO-IR-138","ISO-IR-58","IBM866","ISO-2022-CN","MS936","LATIN-9","ISO-IR-159","IBM862","US","ISO8859-4","ISO8859-14","ISO_8859-14:1998","ISO-IR-199","UHC","850","HZ","IBM819","ISO-CELTIC","ELOT_928","CP1250","CP850","ISO-8859-4","ISO-8859-14","CP950","CYRILLIC","ISO_8859-10:1992","TCVN","ISO-IR-148","X0201","ISO_8859-4","ISO_8859-14","L10","ISO-IR-149","ISO-IR-101","ISO-2022-CN-EXT","LATIN4","ISO-IR-203","X0208","KSC_5601","ISO8859-10","VISCII1.1-1","L7","ISO-IR-14","PT154","TIS620","ISO-IR-109","CSUNICODE11","KOI8-T","RK1048","ISO-8859-10","TIS620.2533-1","ISO646-US","CSISOLATIN1","CSISOLATIN6","CSISOLATIN3","TIS-620","CSISOLATIN5","CSISOLATIN2","TIS620.2529-1","CSKZ1048","CSISOLATINCYRILLIC","KZ-1048","ISO_8859-10","UNICODE-1-1","UTF-16","MS-EE","CSUNICODE","CSKOI8R","LATIN10","CSUCS4","ISO-IR-144","KOI8-R","MS-ANSI","ISO-IR-110","IBM-CP1133","CSIBM866","KS_C_5601-1989","CHAR","EUCKR","BIG5","CP874","ARMSII-8","CSBIG5","UCS-2LE","IBM850","US-ASCII","EUC-KR","CSGB2312","BIG-5","TIS620.2533-0","CN-BIG5","MACCYRILLIC","TIS620-0","MS-CYRL","CYRILLIC-ASIAN","ECMA-118","ISO-IR-179","C</p> |

SISOLATIN4","ISO-10646-UCS-2","UCS-4LE","PTCP154","CSISO14JISC
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 ","ISO-10646-UCS-4","UCS-2BE","MULELAO-1","CSISO159JISX0212199
 0","GREEK","TCVN5712-1","CSISO58GB231280","TCVN-5712","CSPTCP
 154","ECMA-114","CSUNICODE11UTF7","ANSI_X3.4-1986","UNICODELI
 TTLE","ISO8859-7","CN-GB-ISOIR165","STRK1048-2002","ANSI_X3.4-19
 68","KOI8-U","UCS-2-INTERNAL","UCS-4BE","ISO-8859-7","JIS_C6220-1
 969-RO","UNICODE-1-1-UTF-7","WINDOWS-1251","WINDOWS-1256","W
 INDOWS-1253","WINDOWS-1255","WINDOWS-1252","WINDOWS-936","
 WINDOWS-1258","CSEUCKR","KS_C_5601-1987","ISO_8859-7","JIS020
 8","UTF-16BE","LATIN7","UTF-32BE","MACTHAI","UCS-4-INTERNAL","C
 SISOLATINGREEK","MACROMAN","EUCTW","ISO-IR-57","ISO-IR-157","I
 SO-IR-127","ISO-IR-87","WINDOWS-1254","ISO_8859-3:1988","ISO_8859
 -5:1988","IBM367","ISO_8859-8:1988","CSISO57GB1988","NEXTSTEP","
 CSISO2022JP2","ISO_8859-9:1989","KOI8-RU","MACINTOSH","WINDO
 WS-1250","JIS_X0212","ISO-2022-JP-1","MACCROATIAN","HP-ROMAN8
 ","ISO-2022-JP-2","ISO_8859-4:1988","BIG5HKSCS","ASMO-708","EUCJ
 P","MACCENTRALEUROPE","CSPC862LATINHEBREW","EUC-JP","CSS
 HIFTJIS","ISO646-JP","JISX0201-1976","JIS_X0201","CSISOLATINHEBR
 EW","MACARABIC","CSISO87JISX0208","JIS_X0208","UTF-7","MACGRE
 EK","CSISO2022JP","MS-TURK","JIS_X0212-1990","WINDOWS-1257","J
 S_X0208-1983","MS-GREEK","CSHPROMAN8","JAVA","MS-HEBR","CS
 MACINTOSH","ISO-2022-JP","CSEUCTW","GEORGIAN-PS","UNICODEB
 IG","MS_KANJI","CSPC850MULTILINGUAL","MACUKRAINE","ISO_8859-
 1:1987","ISO_8859-6:1987","ISO_8859-7:2003","GEORGIAN-ACADEMY",
 "ISO_8859-2:1987","JIS_X0212.1990-0","JIS_X0208-1990","WCHAR_T",
 MACROMANIA","WINDOWS-874","CSEUCPKDFMTJAPANESE","MS-AR
 AB","UCS-2-SWAPPED","TCVN5712-1:1993","HEBREW","UCS-4-SWAPP
 ED","JOHAB","MACTURKISH","ISO_8859-7:1987","WINBALTRIM"