# AT Command User Guide

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SW-BASE-UG-0006

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# 1. Introduction

## 1.1. Scope of this document

This document describes the set of AT commands supported by the SPREADTRUM module. This set can control and manipulate all types of services related with GSM / TD-SCDMA network, such as Call, SMS, SS, and GRPS services. It can also control ME related functions, reading and writing IMEI, manipulating phonebooks, etc.

## 1.2. Correlative documents

The interface of this document refers to these document criterions below:
1: ETSI GSM 07.05:
2: Digital cellular telecommunications system (Phase 2+);
3: Use of Data Terminal Equipment - Data Circuit terminating;
4: Equipment (DTE - DCE) interface for Short Message Service (SMS) and
5: Cell Broadcast Service (CBS)
6: (GSM 07.05 version 7.0.1 Release 1998)

ETSI GSM 07.07:
Digital cellular telecommunications system (Phase 2+);
AT command set for GSM Mobile Equipment (ME)
(GSM 07.07 version 7.5.0 Release 1998)

ITU-T Recommendation V.25 ter:
Serial asynchronous automatic dialing and control

ETSI GSM 03.40:
Digital cellular telecommunications system (Phase 2+);
Technical realization of the Short Message Service (SMS);
(GSM 03.40 version 7.4.0 Release 1998)

ETSI GSM 03.38:
Digital cellular telecommunications system (Phase 2+);
Alphabets and language-specific information
(GSM 03.38 version 7.2.0 Release 1998)

ETSI GSM 04.80:
Digital cellular telecommunications system (Phase 2+);
Mobile radio interface layer 3 supplementary services specification;
Formats and coding
(GSM 04.80 version 7.1.0 Release 1998)

3GPP TS 27.007 V3.13.0:
AT command set for User Equipment (UE)
3GPP TS 23.038 V3.3.0:

Alphabets and language-specific information
3GPP TS 23.040 V3.10.0:
<Technical realization of Short Message Service (SMS)
Recommendation V.25 ter V0025-TE.DOC:
ITU-T
TCG (TD-SCDMA UE Test Certification Working Group)
China Mobile EWalk AT Command Specification.1.1.0
OMS RIL AT Interface (V1.0.1)

## 1.3. Serial port configuration

For SPREADTRUM module, the serial port configuration is set with the following default values:
Baud Rate: 115200BPS

Data Bit: 8
Parity Code: None
Stop Bit: 1
Data Stream Control: None
The communication to SPREADTRUM can be realized by a serial link handler in WIN2000. First, input the name. Then, configure according to figure 1-1:

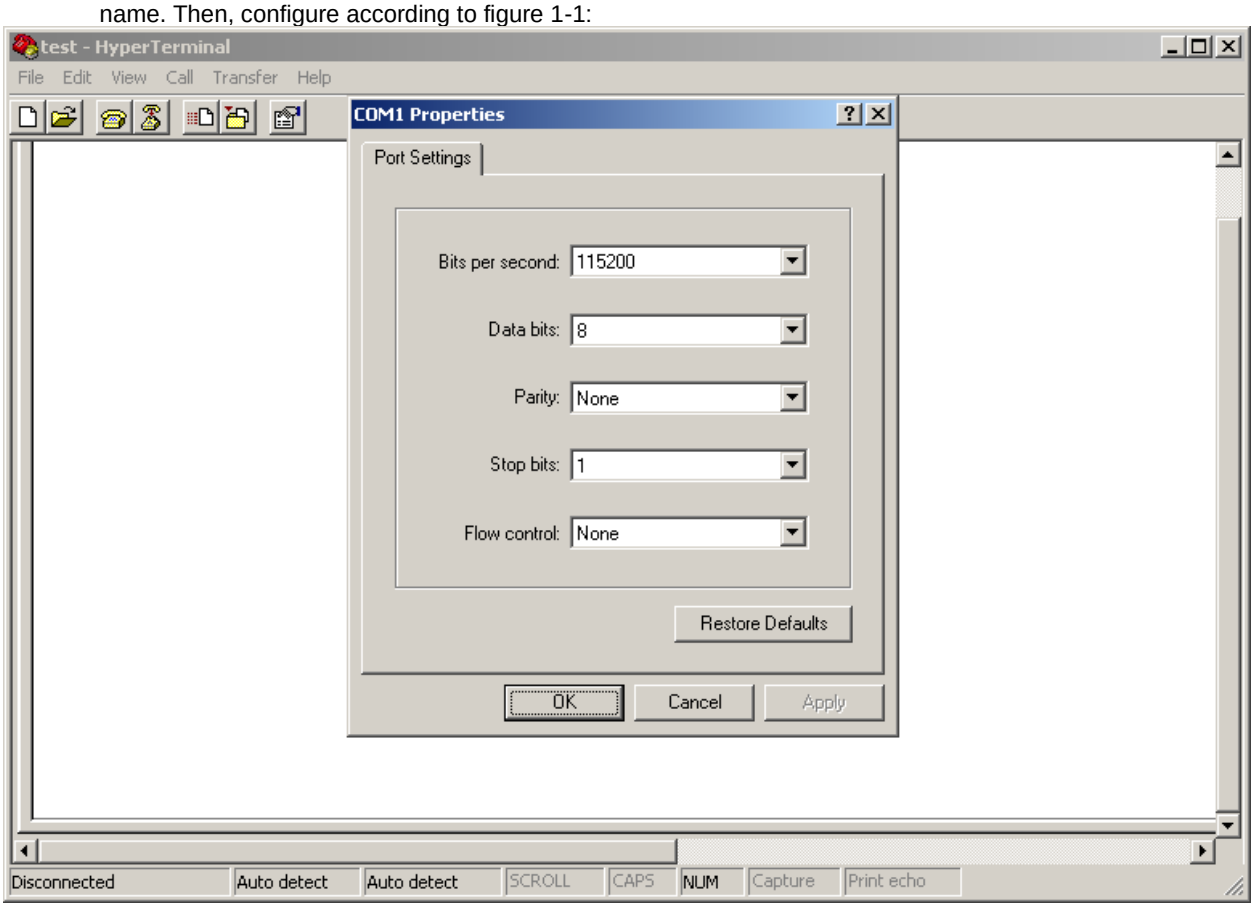


Figure 1-1 Hyperterminal Setting

## 1.4. Commands

Each AT command is started with “AT” and ended with <CR>. Figure 1-2 decrypts the structure of a command line, which consists of many commands, each of which is separated by semicolon. The standard commands refer to V.25 criterion. GSM commands make use of the extended command grammar. Each extent command provides a test command (trailing=?) to check the existence of this command as well as offer the type and range of parameters. Usually every command with parameters provides a Read Command to read the current value of parameters. Besides, an execution command is used to set Parameters and accomplish corresponding functions.

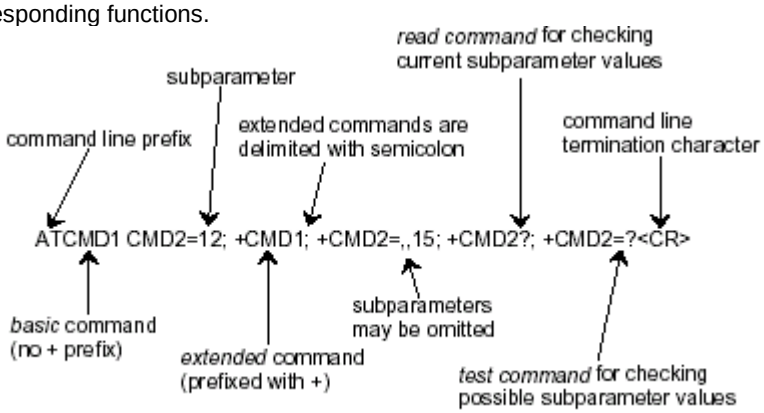


Figure 1-2

## 1.5. Information Responses and result codes

According to Figure 1-3, the returned results of every executed command started and finished with <CR>, <LF> except for those configured by ATV0 and ATQ1.If the executed command is ATVO, then the returned value is 0<CR>. If is ATQO, don't return any result.

If command syntax is incorrect, an ERROR character string will be returned.

If command syntax is correct, but with some incorrect parameters, the +CMR ERROR: <err> (for commands except the SMS commands), or +CMS ERROR: <err> (for commands related with short messages) will be returned.

If a command has been performed successfully, an OK character string will be returned.

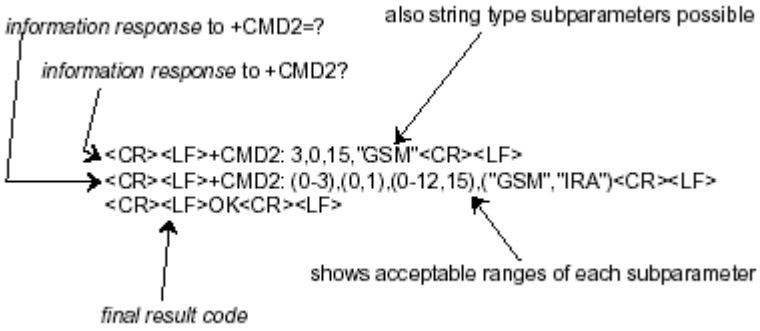


Figure 1-3

In some case, such as receiving short messages, formatted character strings will be sent to the terminal. This will be illustrated in details, while respective commands are explained afterwards.
If the returned value indicates something wrong, different results can be achieved by AT+CMMEE=<value>.

| <value> | Description |
|---|---|
| 0 | Cancel +CME ERROR returning code |
| 1 | Activate+ CME ERROR returning code and usage of numeric error code |
| 2 | Activate+ CME ERROR returning code and detailed description |

This table below lists the possible values of returned wrong numeric error code and their description (except those corresponding with short messages):

| NUM | Numeric error code | Description |
|---|---|---|
| 1 | +CME ERROR:0 | +CME ERROR: phone failure |
| 2 | +CME ERROR:1 | +CME ERROR: no connection to phone |
| 3 | +CME ERROR:2 | +CME ERROR: phone-adaptor link reserved |
| 4 | +CME ERROR:3 | +CME ERROR: operation not allowed |
| 5 | +CME ERROR:4 | +CME ERROR: operation not supported |
| 6 | +CME ERROR:5 | +CME ERROR: PH-SIM PIN required |
| 7 | +CME ERROR:6 | +CME ERROR: PH-FSIM PIN required |
| 8 | +CME ERROR:7 | +CME ERROR: PH-FSIM PUK required |
| 9 | +CME ERROR:10 | +CME ERROR: SIM not inserted |
| 10 | +CME ERROR:11 | +CME ERROR: SIM PIN required |
| 11 | +CME ERROR:12 | +CME ERROR: SIM PUK required |
| 12 | +CME ERROR:13 | +CME ERROR: SIM failure |
| 13 | +CME ERROR:14 | +CME ERROR: SIM busy |
| 14 | +CME ERROR:15 | +CME ERROR: SIM wrong |
| 15 | +CME ERROR:16 | +CME ERROR: incorrect password |
| 16 | +CME ERROR:17 | +CME ERROR: SIM PIN2 required |
| 17 | +CME ERROR:18 | +CME ERROR: SIM PUK2 required |

| | | |
|---|---|---|
| 18 | +CME ERROR:20 | +CME ERROR: memory full |
| 19 | +CME ERROR:21 | +CME ERROR: invalid index |
| 20 | +CME ERROR:22 | +CME ERROR: not found |
| 21 | +CME ERROR:23 | +CME ERROR: memory failure |
| 22 | +CME ERROR:24 | +CME ERROR: text string too long |
| 23 | +CME ERROR:25 | +CME ERROR: invalid characters in text string |
| 24 | +CME ERROR:26 | +CME ERROR: dial string too long |
| 25 | +CME ERROR:27 | +CME ERROR: invalid characters in dial string |
| 26 | +CME ERROR:28 | +CME ERROR: GPRS operation failure |
| 27 | +CME ERROR:29 | +CEM ERROR: GPRS send data failure |
| 28 | +CME ERROR:30 | +CME ERROR: no network service |
| 29 | +CME ERROR:31 | +CME ERROR: network timeout |
| 30 | +CME ERROR:32 | +CME ERROR: network not allowed - emergency calls only |
| 31 | +CME ERROR:40 | +CME ERROR: network personalization PIN required |
| 32 | +CME ERROR:41 | +CME ERROR: network personalization PUK required |
| 33 | +CME ERROR:42 | +CME ERROR: network subset personalization PIN required |
| 34 | +CME ERROR:43 | +CME ERROR: network subset personalization PUK required |
| 35 | +CME ERROR:44 | +CME ERROR: service provider personalization PIN required |
| 36 | +CME ERROR:45 | +CME ERROR: service provider personalization PUK required |
| 37 | +CME ERROR:46 | +CME ERROR: corporate personalization PIN required |
| 38 | +CME ERROR:47 | +CME ERROR: corporate personalization PUK required |
| 39 | +CME ERROR:48 | +CME ERROR: hidden key required |
| 40 | +CME ERROR:60 | +CME ERROR:AT command discarded |
| 41 | +CME ERROR:62 | +CME ERROR: SIM card reject by network |
| 42 | +CME ERROR:63 | +CME ERROR: SIM card service not available |
| 43 | +CME ERROR:64 | +CME ERROR: SIM card PIN uninitialized |
| 44 | +CME ERROR:65 | +CME ERROR: SIM card PIN blocked |
| 45 | +CME ERROR:66 | +CME ERROR: SIM card PUK blocked |
| 45 | +CME ERROR:100 | +CME ERROR: unknown |
| 46 | +CME ERROR:103 | +CME ERROR: Illegal MS (#3) |
| 47 | +CME ERROR:106 | +CME ERROR: Illegal ME (#6) |
| 48 | +CME ERROR:107 | +CME ERROR:GPRS services not allowed (#7) |
| 50 | +CME ERROR:111 | +CME ERROR:PLMN not allowed (#11) |
| 51 | +CME ERROR:112 | +CME ERROR: Location area not allowed (#12) |
| 52 | +CME ERROR:113 | +CME ERROR: Roaming not allowed in this location area (#13) |
| 53 | +CME ERROR:132 | +CME ERROR: Service option not supported (#32) |
| 54 | +CME ERROR:133 | +CME ERROR: Request service option not subscribed (#33) |
| 55 | +CME ERROR:134 | +CME ERROR: Service option temporarily out of order(#34) |
| 56 | +CME ERROR:148 | +CME ERROR: unspecified GPRS error |
| 57 | +CME ERROR:149 | +CME ERROR:PDP authentication failure |
| 58 | +CME ERROR:150 | +CME ERROR: invalid mobile class |
| 59 | +CME ERROR:533 | +CME ERROR: Missing or unknown apn |

This table below lists the possible numeric error code and detailed Description:

| NUM | Numeric error code | Description |
|---|---|---|
| 1 | +CMS ERROR: 301 | +CMS ERROR: SMS service of ME reserved |
| 2 | +CMS ERROR: 302 | +CMS ERROR: Operation not allowed |
| 3 | +CMS ERROR: 303 | +CMS ERROR: Operation not supported |
| 4 | +CMS ERROR: 304 | +CMS ERROR: Invalid PDU mode parameter |
| 5 | +CMS ERROR: 305 | +CMS ERROR: Invalid text mode parameter |
| 6 | +CMS ERROR: 310 | +CMS ERROR: SIM not inserted |
| 7 | +CMS ERROR: 311 | +CMS ERROR: SIM PIN required |
| 8 | +CMS ERROR: 312 | +CMS ERROR: SIM failure |
| 9 | +CMS ERROR: 313 | +CMS ERROR: SIM PUK required |
| 10 | +CMS ERROR: 316 | +CMS ERROR: SIM PIN2 required |
| 11 | +CMS ERROR: 317 | +CMS ERROR: SIM PUK2 required |
| 12 | +CMS ERROR: 318 | +CMS ERROR: SIM failure |
| 15 | +CMS ERROR: 321 | +CMS ERROR: Invalid memory index |
| 16 | +CMS ERROR: 322 | +CMS ERROR: SIM memory full |
| 17 | +CMS ERROR: 330 | +CMS ERROR: SC address unknown |
| 18 | +CMS ERROR: 334 | +CMS ERROR: no +CNMA acknowledgement expected |

This table below lists the possible numeric error code detailed Description in CALL and GPRS service.

| MUN | Numeric error code | Description |
|---|---|---|
| 1 | +CEER: 0 | +CEER: no error |
| 2 | +CEER: 1 | +CEER: unassigned (unallocated) number |
| 3 | +CEER: 3 | +CEER: no route to destination |
| 4 | +CEER: 6 | +CEER: unacceptable channel |
| 5 | +CEER: 8 | +CEER: operator determinate barring |
| 6 | +CEER: 16 | +CEER: normal clearing |
| 7 | +CEER: 17 | +CEER: user busy |
| 8 | +CEER: 18 | +CEER: no user responding |
| 9 | +CEER: 19 | +CEER: alerting no answer |
| 10 | +CEER: 21 | +CEER: call rejected |
| 11 | +CEER: 22 | +CEER: number changed |
| 12 | +CEER: 26 | +CEER: non select user clearing |
| 15 | +CEER: 27 | +CEER: destination out of order |
| 16 | +CEER: 28 | +CEER: invalid number format |
| 17 | +CEER: 29 | +CEER: facility rejected |
| 18 | +CEER: 30 | +CEER: response to status query |
| 19 | +CEER: 31 | +CEER: normal unspecified |
| 20 | +CEER: 34 | +CEER: no circuit channel available |
| 21 | +CEER: 38 | +CEER: net out of order |
| 22 | +CEER: 41 | +CEER: temporary failure |
| 23 | +CEER: 42 | +CEER: switch congestion |
| 24 | +CEER: 43 | +CEER: access information discarded |
| 25 | +CEER: 44 | +CEER: request circuit channel unavailable |
| 26 | +CEER: 47 | +CEER: resources unavailable |
| 27 | +CEER: 49 | +CEER: quality of service unavailable |
| 28 | +CEER: 50 | +CEER: request facility not subscribe |
| 29 | +CEER: 55 | +CEER: CUG incoming barred |
| 30 | +CEER: 57 | +CEER: bear capability not authorization |
| 31 | +CEER: 58 | +CEER: bear capability unavailable |
| 32 | +CEER: 63 | +CEER: service unavailable |
| 33 | +CEER: 65 | +CEER: bear service not implement |
| 34 | +CEER: 68 | +CEER: ACM equal to or greater than ACMmax |
| 35 | +CEER: 69 | +CEER: request facility not implement |
| 36 | +CEER: 70 | +CEER: only restrict digital available |
| 37 | +CEER: 79 | +CEER: service option not implement |

| | | |
|---|---|---|
| 38 | +CEER: 81 | +CEER: invalid |
| 39 | +CEER: 87 | +CEER: user not in CUG |
| 40 | +CEER: 88 | +CEER: incompatibility destination |
| 41 | +CEER: 91 | +CEER: invalid transit net |
| 42 | +CEER: 95 | +CEER: invalid message semantic |
| 43 | +CEER: 96 | +CEER: mandatory IE error |
| 44 | +CEER: 97 | +CEER: message nonexistent |
| 45 | +CEER: 98 | +CEER: message non-compatible error |
| 46 | +CEER: 99 | +CEER: IE nonexistent |
| 47 | +CEER: 100 | +CEER: invalid condition IE |
| 48 | +CEER: 101 | +CEER: message incompatibility state |
| 49 | +CEER: 102 | +CEER: recover on timer |
| 50 | +CEER: 111 | +CEER: protocol error |
| 51 | +CEER: 127 | +CEER: interworking |
| 52 | +CEER: 150 | +CEER: authentication rejected |
| 53 | +CEER: 151 | +CEER: emergency call only |
| 54 | +CEER: 152 | +CEER: IMSI detach |
| 55 | +CEER: 153 | +CEER: T3230 expiry |
| 56 | +CEER: 154 | +CEER: connection error |
| 57 | +CEER: 171 | +CEER: no network service |
| 58 | +CEER: 172 | +CEER: emergency call only |
| 59 | +CEER: 173 | +CEER: normal disconnect |
| 60 | +CEER: 174 | +CEER: remote disconnect |
| 61 | +CEER: 175 | +CEER: low failure |
| 62 | +CEER: 176 | +CEER: network reject |
| 63 | +CEER: 177 | +CEER: no cell |
| 64 | +CEER: 202 | +CEER: supplement not provide |

Notes: the error code has some redefinition.

## 1.6. Boot-strap USIM/SIM Init Flow

The process of boot-strap can be determined by whether there is a USIM/SIM card or it is locked. Moreover, whether or not sending hint character strings to the terminal can be set by AT+SIND command. The AT+SIND=1023 command will show users how this module works. The boot-strap flows on some conditions are listed below: (corresponding meaning can be gotten by AT+SIND command, depends on the type of USIM/SIM cards）

USIM/SIM card is legal and PIN is not required

+SIND: 3
+SIND: 4
+SIND: 1
+SIND: 10,"SM",1,"FD",1,"LD",1,"MC",1,"RC",1,"ME",1
+STIN: 0 （Notes: This line is not displayed, unless USAT/STk is supported）
+SIND: 11

When USIM/SIM card is legal and PIN is required(PIN is locked）

+SIND: 3
+SIND: 4
+SIND: 7
AT+CPIN=1234(input PIN codes）
OK
+SIND: 1
+SIND: 10,"SM",1,"FD",1,"LD",1,"MC",1,"RC",1,"ME",1
+SIND: 11

When there is no USIM/SIM card

+SIND: 3
+SIND: 4
+SIND: 0
+SIND: 10,"SM",0,"FD",0,"LD",0,"MC",0,"RC",0,"ME",0
+SIND: 7

+SIND URC code Description:

| +SIND URC Code | Bit | Description |
|---|---|---|
| +SIND: 0<br>+SIND: 1 | Bit0 | +SIND: 0: SIM card Insert indication<br>+SIND: 1: SIM card Remove indication |
| +SIND: 2 | Bit1 | Calling party alert indication |
| +SIND: 3 | Bit2 | indication that product is ready (except for phonebooks, AOC, SMS),but still in emergency mode |
| +SIND: 4 | Bit3 | Indication that the product is ready to process all AT commands. |
| +SIND: 5 | Bit4 | Indication that a new call identifier has been created. |
| +SIND: 6 | Bit5 | Indication that a call has been released |
| +SIND: 7<br>+SIND: 11 | Bit6 | +SIND: 7: Network service registration failure indication<br>+SIND: 11: Network service available indication |
| +SIND: 8 | Bit7 | Network lost indication |
| +SIND: 9 | Bit8 | Audio On indication |
| +SIND: 10 | Bit9 | SIM phonebook status indication |
| +SIND: 12 | - | SMS ready indication |

## 1.7. Abbreviations

In this document, the following definitions and abbreviations apply:

| | |
|---|---|
| ACM | Accumulated call meter |
| APN | Access Point Name |
| BM | ME short message storage |
| DCE | Data Communication Equipment |
| DSP | Digital Signal Processing |
| DTE | Data Terminal Equipment |
| DMT | Data Mobile Termination |
| DTMF | Dual Tone Multi Frequency |
| GGSN | Gateway GPRS Support Node |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile Communications |
| IMEI | International Mobile Equipment Identity |
| IMSI | International Mobile Subscriber Identity |
| MO | Mobile Originated |
| MT | Mobile Terminated |
| MS | Mobile Station |
| TE | Terminal Equipment |
| TA | Terminal Adaptation |
| $MT_2$ | Mobile Termination |
| MSISDN | Mobile Station International ISDN Number |
| PDP | Packet Data Protocol |
| PDU | Protocol Data Unit |
| PS | Protocol Stack |
| QOS | Quality of Service |
| RSSI | Received Signal Strength Indication |
| SIM | Subscriber Identity Model |
| USIM | Universal Subscriber Identity Model |
| SM | SIM storage |
| SMS | Short Message Service |
| SR | ME short message status report storage |
| STK | SIM Application Toolkit |
| USSD | Unstructured supplementary Service Data |
| URC | Unsolicited result code |
| IA5 | The T.50 International Alphabet 5 |
| OMS RIL | Open Mobile System Radio Interface Layer |

# 2. General Control Commands

## 2.1. AT

**Description:**

This command is used to check whether to be able to communicate with DCE or not.

**Execution Command:**

AT
Return:
OK

## 2.2. ATZ

**Description:**

This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer.

**Execution Command:**

ATZ
Return:
OK

**Reference:**

ITU V.25 ( Section: 6.1.1 )

## 2.3. ATE

**Description:**

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:**

ATE<value>
Return:
OK

**Parameters:**

| value | Description |
|---|---|
| 0 | DCE does not echo characters during command state and online command state |
| 1 | DCE echoes characters during command state and online command state. |

**Example:**

ATE0
OK

ATE1
OK

**Reference:**

ITU V.25 ( Section: 6.2.4 )

## 2.4. ATQ

**Description:**

This command determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code, header, result text, line terminator, or trailer is transmitted. Information text transmitted in response to commands is not affected by the setting of this parameter.

**Set Command:**

ATQ<value>
Return:
OK /No string

**Parameter:**

| <value> | Description |
|---|---|
| 0 | DCE transmits result codes |
| 1 | Result codes are suppressed and not transmitted |

**Example:**

ATQ0
OK

**Reference:**

ITU V.25 ( Section: 6.2.5 )

## 2.5. ATV

**Description:**

This command determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or .verbose.) form. The text portion of information responses is not affected by this setting.

**Execution Command:**

ATV<value>
Return:
OK/none

**Read Command:**

ATV?
Return:
1
OK
OR
0
0

**Test Command:**

ATV=?
Return:
V: (0, 1)
OK

**Parameter:**

<value>
0: DCE transmits limited headers and trailers and numeric text.
1: DCE transmits full headers and trailers and verbose response text.

**Reference:**

ITU V.25 ( Section: 6.2.6 )

## 2.6. ATS0

**Description:**

Set the value of S0

**Set Command:**

ATS0
Return：
OK

**Parameter:**

S0：
Sets the numbers of call indications(rings) before automatically answering the call. Value equalling Zero disables automatic answering and is the default

## 2.7. ATS2

**Description:**

Set the value of S2

**Set Command:**

ATS2=<value>
Return：
OK

**Parameter:**

value：0-255

## 2.8. ATS3

**Description:**

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

**Set Command:**

ATS3=<n>
Return:
OK

**Read Command:**

ATS3?
Return:
<n>
OK

**Test Command:**

ATS3=?
Return:
(0-127)

**Parameter:**

<n>:
(0-127), Set command line termination character to this value, default value is 13 (corresponds to enter character in the ASCII Code)
Notes: if the value is changed, it is possible to affect the result of AT command.

**Reference:**

ITU V.25 ( Section: 6.2.1 )

## 2.9. ATS4

**Description:**

This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter). If the value of S4 is changed in a command line, the result code issued in response to that command line will use the new value of S4.

**Set Command:**

ATS4=<n>
Return:
OK

**Read Command:**

ATS4?
Return:
<n>
OK

**Test Command:**

ATS4=?
Return:
(0-127)

**Parameter:**

<n>:

0－127: Set response formatting character to this value, default value is 10 (corresponds to newline character in the ASCII code)

**Example:**

ATS4=10
OK
ATS4?
10
OK

**Reference:**

ITU V.25 ( Section: 6.2.2 )

## 2.10. ATS5

**Description:**

The command is used to the character recognized by the DCE as a request to delete from the command line the immediately preceding character

**Set Command:**

ATS5=<n>
Return:
OK

**Read Command:**

ATS5?
Return:
<n>
OK

**Test Command:**

ATS5=?
Return:
(0-127)

**Parameter:**

<n>:
0－127: Set S5 field in ASCII code, default value is 8 (correspond to backspace in the ASCII code)

**Example:**

ATS5=8
OK

ATS5?
8
OK

**Reference:**

ITU V.25 ( Section: 6.2.3 )

## 2.11. ATS6

**Description:**

Set the value of S6

**Set Command:**

ATS6=<value>
Return：
OK

**Parameter:**

value：2-255
Ignored (pause before blind dialling)

## 2.12. ATS7

**Description:**

Set the value of S7

**Set Command:**

ATS7
Return：
OK

**Read Command:**

ATS7?
Return：
OK

**Test Command:**

ATS7=?
Return：S7:（1-255）
OK

**Parameter:**

S7：
Sets number of seconds to wait for completion of call answering or originating procedure before giving up and disconnecting

## 2.13. ATS8

**Description:**

Set the value of S8

**Set Command:**

ATS8
Return：
OK

**Parameter:**

S8：
Sets number of seconds to wait when comma dial modifier encountered in dial string of D command (default is 2 seconds)

## 2.14. ATS10

**Description:**

Set the value of S10

**Set Command:**

ATS10
Return：
OK

**Parameter:**

S10：
Sets number of tenths of seconds to wait before disconnecting after TA has indicated the absence of received line signal

## 2.15. AT&W

**Description:**

This command is used to write the active configuration to non-volatile memory section and modify the respective values by commands (according to the table below). These values shall be reset, if system reboots or power off before AT&W command is performed and these values haven't been stored to the section.

**Execution Command:**

AT&W
Return:
OK

The table below is the list of parameters stored to non-volatile section by AT&W command:

| NUM | Content | AT command（modify respective values） |
|---|---|---|
| 1 | Flag of CLIP | AT+CLIP |
| 2 | Flag of COLP | AT+COLP |
| 3 | Mode of SMS | AT+CMGF |
| 4 | Flag of mixed modes | AT+SMUX |
| 5 | Flag of charge state | AT+SBCM |
| 6 | Flag of echo character | ATE |
| 7 | Mode of CREG | AT+CREG |
| 8 | Flag of SIDE TONE | AT+SIDET |
| 9 | Sequence num of incoming music | AT+SCDM |
| 10 | Format of returned error | AT+CMEE |

## 2.16. AT&F

**Description:**

This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria. The restored parameters include S3, S4, S5, E, V, +COPS(<format>), +CLIP, +CCWA(<n>), +CUSD(<n>), +CMEE, +CPMS, +CSMS, +CMGF, +CSCA, +CNMI, and so on .

**Execution Command:**

AT&F[<value>]
Return:
OK

**Parameter:**

< value >
0: restore all of MS' Parameters to default value.

**Example:**

AT&F0
OK

**Reference:**

ITU V.25 ( Section: 6.1.2 )

## 2.17. AT+CMEE

**Description:**

This 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.

**Set Command:**

AT+CMEE=<value>
Return:
OK

**Read Command:**

AT+CMEE?
Return:
+CMEE: <value>
OK

**Test Command:**

AT+CMEE=?
Return:
+CMEE: (0-2)
OK

**Parameter:**

| <value> | Description |
|---|---|
| 0 | Deactivate +CME ERROR Return code |
| 1 | Activate +CME ERROR return code and use numeric error values |

| | |
|---|---|
| 2 | Activate +CME ERROR return code and use verbose error description |

**Reference:**

3GPP 27007-730 ( Section: 9.1 )

## 2.18. AT+CFUN

**Description:**

Set command selects the level of functionality <fun> in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, MT resetting with <rst> parameter may be utilized.

**Set Command:**

AT+CFUN=< fun >, [< rst >]
Return:
OK

**Test Command:**

AT+CFUN=?
Return:
+CFUN: (0-4), (0-1)
OK

**Parameter:**

| fun | Description |
|---|---|
| 0 | minimum functionality |
| 1 | full functionality |
| 2 | disable phone transmit RF circuits only (NOT Supported) |
| 3 | disable phone receive RF circuits only (NOT Supported) |
| 4 | disable phone both transmit and receive RF circuits |

| rst | Description |
|---|---|
| 0 | do not reset the MT before setting it to <fun> power level |
| 1 | reset the MT before setting it to <fun> power level |

**Example:**

Reboot module
AT+CFUN=1, 1
OK

Activate PS
AT+CFUN=1
OK

**Reference:**

3GPP 27007-730 ( Section: 8.2 )

## 2.19. AT+CCLK

**Description:**

This command sets the real-time clock of the MT. If setting fails in an MT error, +CME ERROR: <err> is returned.

**Read Command:**

AT+CCLK?
Return:
+CCLK: <current date and time>
OK

**Parameter:**

< time >: “yy/mm/dd,hh:mm:ss”, total length is 17, users must input data according to this format, or it will return ERROR.

**Example:**

AT+CCLK=“ 03/05/23, 09:45:10”
OK

**Reference:**
3GPP 27007-730 ( Section: 8.15 )

## 2.20. AT+IPR

**Description:**
This command is used to set or get the data rate at which the DCE will accept commands. This numeric extended-format parameter (<rate>) specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s. It 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. Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line.

**Set Command:**
AT+IPR=<rate>
Return:
OK / ERROR

**Read Command:**
AT+IPR?
Return:
+IPR: <rate>
OK

**Test Command:**
AT+IPR=?
Return:
+IPR:{1200,2400,4800,9600,19200,38400,57600,115200,230400,460800}
OK

**Parameter:**
<rate>: {1200,2400,4800,9600,19200,38400,57600,115200,230400,460800}
Notes: default value is 115200.

**Reference:**
ITU V.25 ( Section: 6.2.10 )

## 2.21. AT+CGSN

**Description:**
Execution command causes the TA to return one or more lines of information text <sn>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the individual MT to which it is connected to. Typically, the text will consist of a single line containing the IMEI (International Mobile station Equipment Identity) number of the MT, but manufacturers may choose to provide more information if desired.

**Execution Command:**
AT+CGSN
Return:
<sn>
OK

**Test Command:**
AT+CGSN=?
Return:
OK

**Parameter:**
<sn>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

**Example:**
AT+CGSN
33219070097265020
OK

**Reference:**

3GPP 27007-730 ( Section: 5.4 )

## 2.22. AT+CGMM

**Description:**

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence .0 <CR>. ( 3/0, 0/13 ) or .OK<CR>. ( 4/15, 4/11, 0/13), so that DTE can avoid false detection of the end of this information text.

**Execution Command:**

AT+CGMM
Return:
<module identification>
OK

**Test Command:**

AT+CGMM=?
Return:
OK

**Example:**

AT+CGMM
V1. 0.1-B7
OK

**Reference:**

ITU V.25 ( Section: 6.1.5 )

## 2.23. AT+CGMR

**Description:**

This command is used to get DCE software version.

**Execution Command:**

AT+CGMR
Return:
< version number>
OK

**Test Command:**

AT+CGMR=?
Return:
OK

**Example:**

AT+CGMR
RIYUE_R1.8.7001.BL0005.BUILD0017
OK

**Reference:**

ITU V.25 ( Section: 6.1.5 )

## 2.24. AT+CGMI

**Description:**

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide any information desired. The total number of

characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence .0 <CR>. ( 3/0, 0/13 ) or.OK <CR>. ( 4/15, 4/11, 0/13 ), so that DTE can avoid false detection of the end of this information text.

**Execution Command:**

AT+CGMI
Return:
<manufacturer>
OK

**Test Command:**

AT+CGMI=?
Return:
OK

**Example:**

AT+CGMI
Spreadtrum Communication CO
OK

**Reference:**

ITU V.25 ( Section: 6.1.6 )

## 2.25. AT+CPAS

**Description:**

Execution command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone. Test command returns values supported by the MT as a compound value.

**Execution Command:**

AT+CPAS
Return:
+CPAS: < pas >
OK

**Test Command:**

AT+CPAS=?
Return:
+CPAS: <list supported value>
OK

**Parameter:**

| pas | Description |
|---|---|
| 0 | ready (MT allows commands from TA/TE) |
| 1 | unavailable (MT does not allow commands from TA/TE)(Not supported) |
| 2 | unknown (MT is not guaranteed to respond to instructions) (Not supported) |
| 3 | ringing (MT is ready for commands from TA/TE, but the ringer is active) |
| 4 | call in progress (MT is ready for commands from TA/TE, but a call is in progress) |
| 5 | asleep (MT is unable to process commands from TA/TE because it is in a low functionality state) (Not supported) |

**Reference:**

3GPP 27007-730 ( Section: 8.1 )

## 2.26. AT+CCID

**Description:**

This command reads the EF-ICCID file on the SIM card.

**Read Command:**

AT+CCID?
Return:
+CCID: <sim number>
OK

**Execution Command:**

AT+CCID
Return:
+CCID: <sim number>
OK

**Test Command:**

AT+CCID=?
Return:
+CCID:
OK

**Example:**

AT+CCID?
+CCID:"89860081090209606758"
OK

## 2.27. AT+CIMI

**Description:**

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT.

**Execution Command:**

AT+CIMI
Return:
<imsi>
OK

**Test Command:**

AT+CIMI=?
Return:
OK

**Parameter:**

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

**Example:**

AT+CIMI
460006963106758
OK

**Reference:**

27007-730 ( Section: 5.6 )

## 2.28. AT+CBC

**Description:**

This command is used to indicate the battery connection status <bcs> and the battery charge level <bcl>.

**Execution Command:**

AT+CBC
Return:
+CBC: <bcs>, <bcl>
OK

**Test Command:**

AT+CBC=?
Return:
+CBC: (0-2), (0-100)
OK

**Parameter:**

| <bcs> | Description |
|---|---|
| 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 (not support in current) |

| | |
|---|---|
| 3 | Recognized power fault, calls inhibited |

| <bcl> | Description |
|---|---|
| 0 | Battery exhausted |
| 1-99 | Capacity（1-99%）of battery |
| 100 | Battery fully charged |

Notes: the command is not realized

**Reference:**

3GPP 27007-730 ( Section: 8.4 )

## 2.29. AT+CPOF

**Description:**

This command is used to power off.

**Execution Command:**

AT+CPOF
Return:
OK

**Test Command:**

AT+CPOF=?
Return:
+CPOF
OK

## 2.30. AT+CSCS

**Description:**

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. When TA-TE interface is set to 8-bit operation and used TE alphabet is 7-bit, the highest bit shall be set to zero.

**Set Command:**

AT+CSCS=<chset>
Return:
OK

**Read Command:**

AT+CSCS?
Return:
+CSCS: <chset>
OK

**Test Command:**

AT+CSCS=?
Return:
+CSCS: （”GSM”, “IRA”, “HEX”, “UCS2”）
OK

**Parameter:**

| Chset | Description |
|---|---|
| “GSM” | GSM 7 bit default alphabet; this setting causes easily software flow control (XON/XOFF) problems. |
| “IRA” | International Reference Character set(ITU-T T.50) |
| “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 |
| “UCS2” | 16-bit universal multiple-octet coded character set; 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. |

Notes: default value is “IRA”.

**Reference:**

3GPP 27007-730 ( Section: 5.5 )

## 2.31. AT+SAC

**Description:**

Execution Command can stop the network searching and supplementary services. Query command can find whether it is searching the network and doing the supplementary services.

**Execution Command:**

AT+SAC
Return:
OK

**Read Command:**

AT+SAC?
Return:
OK/ERROR (While searching the network or doing supplementary services, system returns ERROR. If isn't, system returns OK)

**Test Command:**

AT+SAC=?
Return:
OK

## 2.32. AT+SBCM

**Description:**

This command is used to manage the process of battery charge and set the parameters of battery charge.

**Set Command:**

AT+SBCM=<Mode> [ ,[<ChargeInd>][,[<BattLevelMax>], [<BattLevelMin>], <TPulseInCharge>], [<TPulseOutCharge>], [<BattIntRes>]]]
Return:
OK/ERROR

**Test Command:**

AT+SBCM=?
Return:
+SBCM: (0-3), (0-1), (4000-5000), (2800-3800), (100-10000), (100-10000), (0-255)
OK

**Parameters:**

| <mode> | Description |
|---|---|
| 0 | Stop battery Charge |
| 1 | Start battery Charge |
| 2 | Get the current battery voltage |
| 3 | Set battery charge Parameters |

Notes: When <mode> equals 0 or 1, only parameter< ChargeInd > is valid; when <mode>equals 2, other parameters are invalid.

| < ChargeInd > | Description |
|---|---|
| 0 | Cancel +SBCM hint code |
| 1 | Activate +SBCM code |

<BattLevelMax>: The maximum level of battery voltage. When reached, battery will stop charging. The allowed range is (4000-5000), default value is 4200mv.

<BattLevelMin>: The minimum level of battery voltage. When reached, DCE will be shut off.

<TPulseInCharge>: Time space between pluses in charge: Range（100-10000）, default Value: 100ms

<TPulseOutCharge>: Send +SBCM time space: Allowed Value Range（100-10000）. default Value: 5000ms）

<BattIntRes>: Battery Interior Resistance: Allowed Value Range（0-255mΩ）, default Value: 0 mΩ

## 2.33. +SBCI

**Description:**

+SBCI indicates the current status and voltage of the battery.

**Unsolicited report:**

+SBCI: <status> [,<level>]

**Parameter:**

| <status> | Level |
|---|---|
| 0 | Battery Voltage reached minimum |
| 1 | Battery Voltage reached maximum |
| 2 | Battery in charging |
| 3 | Battery out of charging |

<level>:Current voltage of battery

## 2.34. AT+CMUX

**Description:**

This command is used to enable/disable the multiplexing protocol control channel

**Set Command:**

AT+CMUX=<mode> [, <subset> [, <port_speed> [, <N1> [, <T1> [, <N2> [, <T2> [, <T3> [, <k>]]]]]]]]
Return:
OK

**Read Command：**

AT+CMUX?
Return：
+CMUX: <mode>,[<subset>],<port_speed>,<N1>,<T1>, <N2>,<T2>,<T3>[,<k>]
OK

**Test Command：**

AT+CMUX=?
Return：
+CMUX: (list of supported <mode>s),(list of supported <subset>s),(list of supported <port_speed>s),(list of supported <N1>s),(list of supported <T1>s),(list of supported <N2>s),(list of supported <T2>s),(list of supported <T3>s),(list of supported <k>s)
OK

**Parameter:**

| mode | Description |
|---|---|
| 0 | Basic mode |
| 1 | Advanced mode |

<Mode> default value:0.

| Subset | Description |
|---|---|
| 0 | UIH frames used only |
| 1 | UI frames used only |
| 2 | I frames used only |

<Subset> default value:0

| port_speed | Description |
|---|---|
| 1 | 9 600 bit/s |
| 2 | 19 200 bit/s |
| 3 | 38 400 bit/s |
| 4 | 57 600 bit/s |
| 5 | 115 200 bit/s |
| 6 | 230 400 bits/s |

<Port_speed> default value:5

<N1> (maximum frame size):1-32768
Default value: 31 (64 if Advanced option is used)

<T1> (acknowledgement timer in units of ten milliseconds):

1-255, where 10 is default (100 ms)

<N2> (maximum number of re-transmissions):
0-100, where 3 is default

<T2> (response timer for the multiplexer control channel in units of ten milliseconds):
2-255, where 30 is default (300 ms)
NOTE: T2 must be longer than T1.

<T3> (wake up response timer in seconds):
1-255, where 10 is default

<k> (window size, for advanced operation with Error Recovery options):
1-7, where 2 is default

## 2.35. AT+CLVL

**Description:**

This command is used to select the volume of the internal loudspeaker of the MT.

**Set Command:**

AT+CLVL = <level>
Return:
Ok

**Read Command:**

AT+CLVL?
Return:
+CLVL: <level>
OK

**Test Command**:

AT+CLVL=?
Return:
+Level: (0-7)
OK

**Parameter:**

<level>: integer type value with manufacturer specific range (smallest value represents the lowest sound level)

**Reference:**

3GPP 27007-730 ( Section: 8.23 )

## 2.36. AT+FCLASS

**Description**:

This command puts the TA into a particular mode of operation (data, fax, voice etc.). This causes the TA to process information in a manner suitable for that type of information (rather than for other types of information)

**Set Command**:

AT+ FCLASS=<n>
Return:
OK

**Read Command**:

AT+FCLASS?
Return:
+FCLASS: <n>
OK

**Test Command**:

AT+FCLASS=?
Return:
+FCLASS: (0, 8)
OK

**Parameter:**

<n>
0: data
8: fax
Notes: Other mode is not supported now, refer to 3GPP 27.007

**Reference:**

3GPP 27007-730 (Section: C.2.1)

## 2.37. AT+CSIM

**Description:**

TE may directly send APDU command to SIM card by the command, on condition of following the GSM/UMTS framework agreement

**Set Command:**

AT+CSIM=<length>, <command>
Return:
+CSIM:<length>, <response>

**Test Command**:

AT+CSIM=?
Return:
OK

**Parameter:**

<length>: Integer; the length of APDU command, the value is between 5 and 255
<command>: Hexadecimal; the content of APDU command
<response>:Hexadecimal; the response of the command

**NOTE:**

The command is effective after SIM READY

Support in current:
/* obtain datas */
SIM_GET_RESPONSE

/* select files and get attribution of file */
SIM_SELECT

/* SIM polling */
SIM_STATUS

/*data management */
SIM_READ_BINARY
SIM_UPDATE_BINARY
SIM_READ_RECORD
SIM_UPDATE_RECORD
SIM_SEARCH_RECORD /*SIM_SEEK*/
SIM_INCREASE

/*authentication*/
SIM_AUTHENTICATE /*SIM_RUN_GSM_ALGO*/

/*logical channel manegement*/
SIM_MANEGE_CHANNEL
SIM_GET_CHALLENGE

/*file management*/
SIM_DEACTIVATE_FILE
SIM_ACTIVATE_FILE /*SIM_REHABILITATE*/

/* PIN code manegement */
SIM_VERIFY_PIN
SIM_CHANGE_PIN
SIM_DISABLE_PIN

SIM_ENABLE_PIN
SIM_UNBLOCK_PIN

/* USAT / STK */
SIM_TERMINAL_PROFILE
SIM_ENVELOPE
SIM_FETCH
SIM_TERMINAL_RESPONSE

**Example:**

File Choice:
AT+CSIM=7, “a0a40000023f00”

Data Obtainning:
AT+CSIM=5, “a0c0000017”

SIM polling:
AT+CSIM=5, “A0F2000016”

PIN 1 modification:
AT+CSIM=21, “A024000011031323334FFFFFFFF35363738FFFFFFFF”
(modify original password 1234 to 5678)

## 2.38. AT+CGLA

**Description：**

TE may directly send APDU command to UICC by the command, on condition of following the GSM/UMTS framework agreement

**Set Command：**

AT+CGLA=<sessionid>, <length>, <command>
Return:
+CGLA::<length>, <response>
OK

**Parameter:**

<sessionid>: Integer; specify logical channel. Value: 1~3
<length>: Integer; the length of APDU command, Value: 5 ~ 255
<command>: Hexadecimal; the content of APDU command
<response>:Hexadecimal; the response of the command

## 2.39. AT+CCHC

**Description：**

Close logical channel. UICC will close specified logical channel by this command

**Set Command：**

AT+CCHC=<session id>
Return:
OK

**Parameter:**

<session id>: Integer; specify logical channel. Value: 1~3

## 2.40. AT+CCHO

**Description：**

Close logical channel. UICC will close specified logical channel by selecting corresponding application using this command

**Set Command：**

AT+CCHO=<df name>
Return:
+CCHO:<session id>
OK

**Parameter:**

<df name>:string: it is optional in UICC; the length of string: 2 ~ 32
<session id>: Integer; opened logical channel. Value: 1~3

## 2.41. AT+CTZR

**Description：**

This command is used to enable auto timezone update.

**Set Command：**

AT+CTZR=<ctzv_flag>
Return:
OK

**Read Command：**

AT+CTZR?
Return
ctzv_flag

**Test Command：**

AT+CTZR=?
Return：
CTZR:：(0-1)

**Parameter:**

ctzv_flag： 0：disable 1：enable

## 2.42. AT+STSF

**Description：**

Set NV to configure STK.

**Set Command：**

AT+STSF=<mode> [, <config>] [, <timeout>]
Return:
OK

**Read Command：**

AT+STSF?
Return
STSF：stk_actflag, terminal_profile, stk_time

**Test Command：**

AT+STSF=?
Return：
“0-2, (160060C01F00000000000000-7FFFFFFFFFFFFFFFFFFFFFFF),1-255)”

**Parameter:**

Mode：
0 STK_DEACTIVATE
1 CTIVATE
2 IGURE

## 2.43. AT+ARMLOG

**Description：**

The command is to open or close ARMLOG

**Set Command：**

AT+ARMLOG=<flag>
Return:
OK

**Read Command：**

AT+ARMLOG?
Return
+ARMLOG：<flag>

OK

**Parameter:**

<flag>： 0 disable； 1 enable

## 2.44. AT+OFF

**Description：**

The command force power off PS without detach.

**Set Command：**

AT+OFF
Return:
OK

## 2.45. AT+SPATR

**Description：**

Obtain ATR of SIM card on condition of SIM card inserted

**Read Command：**

AT+SPATR?
Return:
+SPATR：<atr_string>
OK

**Example**

AT+SPATR?
+SPATR：3B9C940068868D0A86980256C2000500
OK

# 3. Network Service Commands

## 3.1. AT+COPS

**Description:**

This command is used to select and register GSM/UMTS network operator (only Read Command is allowed in the case of call existed).

**Set Command:**

AT+COPS=<mode>, [<format>[, <oper>[,< AcT>]]]
Return:
OK/+CME ERROR: <err>

**Read Command:**

AT+COPS?
Return:
+COPS: <mode>[,<format>,<current oper>[,< AcT>]]

**Test Command:**

AT+COPS=?
Return:
+COPS: [list of supported (<stat>, long alphanumeric<oper>, short alphanumeric<oper>s, numeric<oper>,< AcT>)s][,,(list of supported <mode>s),(list of supported <format>s)]

**Parameter:**

| mode | Description |
|---|---|
| 0 | Select automatically（<oper> is ignored） |
| 1 | Select manually (<oper> field shall be present, and <AcT> optionally) |
| 2 | Deregister from network |
| 3 | set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> and < AcT> fields are ignored); this value is not applicable in read command response |
| 4 | manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered |

| format | Description |
|---|---|
| 0 | long format alphanumeric <oper> |
| 1 | short format alphanumeric <oper> |
| 2 | numeric <oper> (Default value) |

| stat | Description |
|---|---|
| 0 | Unknown |
| 1 | Available |
| 2 | Currently used |
| 3 | Forbidden |

| AcT | Description |
|---|---|
| 0 | GSM |
| 1 | GSM Compact |
| 2 | UTRAN |
| 3 | GSM and EGPRS |
| 4 | HSDPA |
| 5 | HSUPA |
| 6 | HSDPA and HSUPA |
| 14 | HSPA+ |

<oper>: Operation code (MCC/MNC numeric codes which is used in network selection, such as 46000 is China Mobile Communication, 46001 is China Unicom)

**Example:**

AT+COPS=?
+COPS: (1,"CHINA MOBILE","CMCC",”46000” ,0),(3,"CHN-CUGSM","CU-GSM",”46001” ,0),,(0-4),(0-2)
OK

AT+COPS?

+COPS: 1, 2, “46000”, 0

Select network automatically
AT+COPS=0
OK

Search network manually
AT+COPS=1, 2, ”46000” ,0
OK

**Reference:**
3GPP 27007-730 (Section: 7.3)

## 3.2. AT+SAC

**Description:**
Abort ongoing PLMN search procedure

**Execution Command:**
AT+SAC
Return:
OK

## 3.3. AT+CSQ

**Description:**
This command is used to received signal strength indication <rssi> and channel bit error rate <ber> from the MT.

**Execution Command:**
AT+CSQ
Return:
+CSQ: <rssi>, <ber>
OK

**Test Command:**
AT+CSQ=?
Return:
+CSQ: (0-31,100-191, 199), (0-7, 99)
OK

**Parameter:**

| rssi | Description |
|---|---|
| 0 | <= -113 dBm |
| 1 | -111 dBm |
| 2-30 | -109... -53 dBm |
| 31 | >= -51 dBm |
| 100 | <= -116 dBm |
| 101 | -115 dBm |
| 102-190 | -114... -26 dBm |
| 191 | >= -25 dBm |
| 199 | Ineffective |

NOTE: RSSI100~199: only used in TD-SCDMA (indicating value of RSCP)

**Example:**
AT+CSQ
+CSQ: 23, 99
OK

**Reference:**
3GPP 27007-730 (Section: 8.5)

## 3.4. AT+CREG

**Description:**

This command controls the presentation of an unsolicited result code when there is a change of the network cell.

**Set Command:**

AT+CREG=<mode>
Return:
OK/ERROR

**Read Command:**

AT+CREG?
+CREG: <mode>, <state> [, <lac>, <ci> [, <AcT>]]
OK

**Test Command:**

AT+CREG=?
Return:
+CREG: (0, 1, 2)
OK

**Parameter:**

<mode> default value is 0

| mode | Description |
|---|---|
| 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>]] |

| state | Description |
|---|---|
| 0 | No registered network, ME does not search new network |
| 1 | Register local network successfully |
| 2 | No register network, ME is searching new network |
| 3 | Network registration is denied |
| 4 | Unknown |
| 5 | Register roam network successfully |

<lac>: location id of cell
<ci>: cell id
<AcT>: access technology of the registered network

0 GSM
1 GSM Compact
2 UTRAN
3 GSM w/EGPRS (see NOTE 1)
4 UTRAN w/HSDPA (see NOTE 2)
5 UTRAN w/HSUPA (see NOTE 2)
6 UTRAN w/HSDPA and HSUPA (see NOTE 2)
15 HSPA+

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

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

**Example**

AT+CREG=1
OK
+CREG: 1

AT+CREG=2
OK
+CREG: 1, “1868”, “1501”, 0

AT+CREG
+CREG: 2, 1, “1868”, “1501”, 0
OK

AT+CREG=0
OK

**Reference:**
3GPP 27007-730 (Section: 7.2)

## 3.5. AT+CPLS

**Description:**
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.

**Set Command:**
AT+CPLS=<list>
Return:
OK/ERROR

**Read Command:**
AT+CPLS?
+CPLS: <list>
OK

**Test Command:**
AT+CPLS=?
Return: +CPLS: (0-2)
OK

**Parameter:**
<list> default value is 0

| list | Description |
|---|---|
| 0 | User controlled PLMN selector with Access Technology $EF_{OPLMNwAcT}$, if not found in the SIM/UICC then PLMN preferred list $EF_{PLMNsel}$ (this file is only available in SIM card or GSM application selected in UICC) |
| 1 | Operator controlled PLMN selector with Access Technology $EF_{OPLMNwAcT}$ |
| 2 | HPLMN selector with Access Technology $EF_{HPLMNwAcT}$ |

**Reference:**
3GPP 27007-730 (Section: 7.20)

## 3.6. AT+CPOL

**Description:**
This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC (GSM or USIM).

**Set Command:**
AT+CPOL= [<index>] [, <format> [, <oper> [, <GSM_AcT>, <GSM_Compact_AcT>, <UTRAN_AcT>]]]
Return:
OK/ERROR

**Read Command:**
AT+CPOL?
+CPOL: <index1>, <format>, <oper1> [, <GSM_AcT1>, <GSM_Compact_AcT1>, <UTRAN_AcT1>]
OK

**Test Command:**
AT+CPOL=?
Return: +CPOL: (list of supported <index>s), (list of supported <format>s)
OK

**Parameter:**
<format>: indicates if the format is alphanumeric or numeric (see +COPS)
<oper>: Operands(string type)(MCC/MNC numeric codes which is used in network selection, such as 46000 is China Mobile Communication, 46001 is China Unicom)

| GSM_AcT | Description |
|---|---|
| 0 | access technology not selected |

| | |
|---|---|
| 1 | access technology selected |

| GSM_Compact_AcT | Description |
|---|---|
| 0 | access technology not selected |
| 1 | access technology selected |

| UTRA_AcT | Description |
|---|---|
| 0 | access technology not selected |
| 1 | access technology selected |

Now not support GSM Compact access technology.

**Reference:**

3GPP 27007-730 (Section: 7.19)

# 4. Call Control Commands

## 4.1. ATD

**Description:**

This command instructs the DCE to originate a call. This may include several steps, depending upon the DCE type, such as: connecting to the line (going off-hook), waiting for the network to indicate readiness to receive call addressing information (wait for dial tone), signalling call addressing information to the network (dialling the number), monitoring the line for call progress signals (e.g. busy), and instructing the underlying DCE to start the call origination procedure (modulation handshaking).

**Execution Command:**

| | |
|---|---|
| ATD<dialing string> | video call |
| ATD<dialing string>; | voice call |
| Return: | |
| OK: | call setup request is already sent to network |
| NO CARRIER: | call connection fails or is released by remote user. |
| ERROR: | error occurs |

**Parameter:**

< dialing string > : {0-9, *, #, +, a, b, c}, the maximum length is 40, if dialing string end with ",#", then the call number will be treat as a emergency call number.

Notes:
At present, call from phonebook is not supported.

**Example:**

**Voice call:**

```
ATD10086;
OK
+ECIND: 0,2,1
*SPCSC: 1,0,,"10086",129,1
^ORIG: 1,0
*SPCSC: 1,3,,"10086",129,1
+SIND: 5,1
*SPVTCP: VOICE
^CONF: 1
+SIND: 2
+ECIND: 0,3,1
*SPCSC: 1,4,,"10086",129,1
+ECIND: 0,0,1
*SPCSC: 1,5,0,"10086",129,1
^CONN: 1,0
+SIND: 9
```

**Video call:**

```
ATD10086
OK
+ECIND: 0,2,1
*SPCSC: 1,0,,"10086",129,1
^ORIG: 1,1
*SPCSC: 1,3,,"10086",129,1
+SIND: 5,1
*SPVTCP: MULTIMEDIA
+SIND: 2
+ECIND: 0,3,1
*SPCSC: 1,4,,"10086",129,1
Supplementary service:
atd**61*00431234*11*5#
OK
```

**Emergency call**

```
atd911, #
OK
+SIND: 5, 1
```

**Note:**

ATC have a special format to support AP side to decide a number is emergency number, like atd<emergency number>@[emergency category],#

**Reference:**

ITU V.25 ( Section: 6.3.1 )

## 4.2. ATDL

**Description:**

This command is used to redial last telephone number used

**Execute Command：**

ATDL

## 4.3. ATA

**Description:**

This command instructs the DCE to immediately connect to the line and start the answer sequence as specified for the underlying DCE. Any additional commands that appear after A on the same command line are ignored.

**Execution Command:**

ATA
Return:
OK

**Reference:**

ITU V.25 ( Section: 6.3.5 )

## 4.4. ATH

**Description:**

This command is used to hang up all( one or several )connecting or connected calls.

**Execution Command:**

ATH<cause>
Return:
OK

**Parameter:**

<cause> value as the following list, default value is 0 if no input

| | | | |
|---|---|---|---|
| | 0 | Unknown cause | |
| | 1. | Unassigned (unallocated) number | |
| | 3. | No route to destination | |
| | 6. | Channel unacceptable | |
| | 8. | Operator determined barring | |
| | 16. | Normal call clearing | |
| | 17. | User busy | |
| | 18. | No user responding | |
| | 19. | User alerting, no answer | |
| | 21. | Call rejected | |
| | 22. | Number changed | |
| | 25. | Pre-emption | |
| | 26. | Non selected user clearing | |
| | 27. | Destination out of order | |
| | 28. | Invalid number format (incomplete number) | |
| | 29. | Facility rejected | |
| | 30. | Response to STATUS ENQUIRY | |
| | 31. | Normal, unspecified | |
| | 34. | No circuit/channel available | |
| | 38. | Network out of order | |
| | 41. | Temporary failure | |
| | 42. | Switching equipment congestion | |
| | 43. | Access information discarded | |
| | 44. | requested circuit/channel not available | |
| | 47. | Resources unavailable, unspecified | |
| | 49. | Quality of service unavailable | |
| | 50. | Requested facility not subscribed | |
| | 55. | Incoming calls barred within the CUG | |
| | 57. | Bearer capability not authorized | |
| | 58. | Bearer capability not presently available | |
| | 63. | Service or option not available, unspecified | |
| | 65. | Bearer service not implemented | |
| | 68. | ACM equal to or greater than ACMmax | |
| | 69. | Requested facility not implemented | |
| | 70. | Only restricted digital information bearer capability is available | |
| | 79. | Service or option not implemented, unspecified | |
| | 81. | Invalid transaction identifier value | |
| | 87. | User not member of CUG | |
| | 88. | Incompatible destination | |
| | 91. | Invalid transit network selection | |
| | 95. | Semantically incorrect message | |
| | 96. | Invalid mandatory information | |
| | 97. | Message type non-existent or not implemented | |
| | 98. | Message type not compatible with protocol state | |
| | 99. | Information element non-existent or not implemented | |
| | 100. | Conditional IE error | |
| | 101. | Message not compatible with protocol state | |
| | 102. | Recovery on timer expiry | |
| | 111. | Protocol error, unspecified | |
| | 127. | Interworking, unspecified | |

**Reference:**

ITU V.25 ( Section: 6.3.6 )

## 4.5. ATS0

**Description:**

The command is used to set the alerting times before automatic answer. Its parameter controls the automatic answering feature of the DCE. For example, in GSTN modem applications, setting this parameter to 1 will cause the modem to answer an incoming call on the first ring.

**Set Command:**

ATS0=<n>
Return:
OK/ERROR

**Read Command:**

ATS0?

Return:
S0: <n>

**Test Command:**

ATS0=?
Return:
S0: (0-255)

**Parameter:**

<n>: Alerting times before automatic answer, the range is 0~255.
If n=0 is set, automatic answer function is closed

**Example:**

ATS0=3
OK
RING
RING
RING
SIND: 9

**Reference:**

ITU V.25 ( Section: 6.3.8 )

## 4.6. AT+VTD

**Description:**

This refers to an integer <n> that defines the length of tones emitted as a result of the +VTS command. This does not affect the D command. A value different than zero causes a tone of duration <n>/10 seconds. The value zero causes a "manufacturer specific" value.

**Set Command:**

AT+VTD=<n>
Return:
OK

**Read Command:**

AT+VTD?
Return:
+VTD: <n>
OK

**Test Command:**

AT+VTD=?
Return:
+VTD: (0-255)
OK

**Parameter:**

<n>: （0-255）n*100ms

**Reference:**

3GPP 27007-730 (Section: C.2.12)

## 4.7. AT+VTS

**Description:**

This command transmits DTMF, after a successful call connection. Setting Command is used to send one or more ASCII characters which make MSC (Mobile Switching Center) send DTMF tone to remote User. Setting command is forbidden in the case of Data or Fax Mode (+FCLASS=0, 1, 2-7).

**Setting Command:**

AT+VTS=<dtmf> or
AT+VTS=<dtmf>, <duration>
Return:
OK/+CME ERROR: <err>

**Test Command:**

AT+VTS=?
Return:
+VTS: (0-9,*,#,A,B,C,D)
OK

**Parameter:**

<dtmf>
A single ASCII character in the set { 0 -9, #, *, A – D}.
< duration >
Refer to duration value range of +VTD command

**Example:**

AT+VTS=2
OK

**Reference:**

3GPP 27007-730 (Section: C.2.11)

## 4.8. AT+VGR

**Description:**

This refers to the amplification by the TA of audio samples sent from the TA to the computer. The command operates on an integer <n>.

**Set Command:**

AT+VGR=<n>
Return:
OK

**Test Command:**

AT+VGR=?
Return:
+VGR: (1-9)

**Read Command:**

AT+VGR?
Return:
+VGR: <n>

**Parameter:**

< n>: the volume of speaker, value range 1-9

**Reference:**

3GPP 27007-730 (Section: C.2.4)

## 4.9. AT+CMUT

**Description:**

This command is used to enable and disable the uplink voice muting during a voice call.

**Set Command:**

AT+CMUT=<mode>
Return:
OK/ERROR

**Read Command:**

AT+CMUT?
Return:
+CMUT: <mode>
OK

**Test Command:**

AT+CMUT=?
Return:
+CMUT: <supported value>
OK

**Parameter:**

<mode>: 0: mute off.
1: mute on.

**Reference:**

3GPP 27007-730 (Section: 8.4)

## 4.10. AT+ECHO

**Description:**

This command configures the ECHO CANCELLATION function for voice calls.
NOTE: This command is not used for some platform

**Set Command:**

AT+ECHO=<mode>,<Algold>,<param1>,<param2>,<param3>,<param4>, <param5>, <param6>
Return:
OK/ERROR

**Read Command:**

AT+ECHO?
Return:
+ECHO:<status>,<Algold>,<param1>,<param2>,<param3>,<param4>, <param5>, <param6>

**Parameter:**

<mode>:
0: Deactivate ECHO；
1: Activate ECHO

<Algold>:
1: Echo Cancellation
3: Echo Cancellation
Echo cancellation 1(4 Parameters)

1: <Volout>
0: 31 db (default)
1: 29 db
2: 27 db
3: 25 db .
14: 3 db
15: 1 db

2:<Step>
0: 1 db
1: 2 db
2: 3 db
3: 4 db (default)
3: <PcmThRel>: [0; 3 1]. (10 by default)
4: <PcmThMax>: [0; 31]. (7 by default)

Echo cancellation 3 (3 Parameters)
1: <AlgoParam>: [0; 63]. (30 by default)
2: <NoiseThres>: [0; 32767]. (80 00 default)
3: <NmbTaps>: [64; 256] (256 by default)

<Status>
0: Echo Deactivated.
1: Echo Activated for Mic/Spk one.
2: Echo Activated for Mic/Spk two.
3: Reset the product.
Notes: Currently, this command is not supported.

## 4.11. AT+CICB

**Description:**

This command sets the type of incoming calls, which is data, fax or speech.

**Set Command:**

AT+CICB=<value>
Return:
OK

**Read Command:**

AT+CICB?
Return:
+CICB: 2

**Test Command:**

AT+CICB=?
Return:
+CICB: (0-2)

**Parameter:**

| value | Description |
|---|---|
| 0 | data |
| 1 | fax |
| 2 | speech |

Notes: Currently, only the call service is supported.

## 4.12. AT+CRMP

**Description:**

Execution command causes the MT to playback a specific ring type. The default values for the optional parameters are the current selected in the MT.

**Set Command:**

AT+CRMP=<call type> [, <num>, <index>]
Return:
OK

**Test Command:**

AT+CRMP=?
Return:
+CRMP: (0-3), (0-65535), (0-47)
OK

**Parameter:**

<call type>: 0: receive calls;
1: receive data;
2: receive faxes;
3: receive short messages.
<num>: 0: keep on playing until user stops it(default value）;
1-65535: play<num>time/times
<index>:If <call type>=0, 1, 2:
0: stop playing ring music;
1-15: the manufacturer defined melody in module;
16-47: downloaded melodies by users;
If <call type>=3:
0: Stop playing short message melody;
1-4: types of short message melody, if index>4, the index of short message is equal to 1

**Example:**

Play ring melody
AT+CRMP=0, 1, 3
+CRMP: 3
OK

Play short message melody
AT+CRMP=3, 1, 4
+CRMP: 4
OK

**Reference:**

27007-730 (Section: 8.35)

## 4.13. AT+CIND

**Description:**

Set command is used to set the values of MT indicators. e.g. voltage of battery, strength of signal, availability of network, stillness, whether receives short messages, existence of a call , roam status and full statutes of SMS.

**Read Command:**

AT+CIND?
Return:
+CIND: <battery>,<signal level>,<service>,<sounder>,<message>,<call>,<roam>,<smsfull>
OK

**Test Command:**

AT+CIND=?
Return:
+CIND:(0-5),(0-31,100-191),(0,1),(0,1),(0,1),(0,1),(0,1),(0,1),(0,1)
OK

**Parameter:**

| <descr> | Description |
|---|---|
| “battchg” | Voltage of a Battery |
| “signal” | Signal strength indication(0-31) |
| “service” | Availability of network (0-1) (value = ’1’means registered to network) |
| “sounder” | Stillness(0-1) ( ‘1’ = Mute) |
| “message” | Whether receives short messages (0-1) |
| “call” | Existence of a call (0-1) |
| “roam” | net status (0-1) (Home net status, ‘0’ = Home Net) |
| “smsfull” | Short message memory storage has become full (‘0’), or memory locations are available (‘1’) |

**Reference:**

3GPP 27007-730 (Section: 8.9)

## 4.14. AT+CHUP

**Description:**

Execution command causes the TA to hangup the current GSM/UMTS call of the MT.

**Execute Command：**

AT+CHUP

**Reference:**

3GPP 27007-730 (Section: 6.5)

## 4.15. AT+CHUPVT

**Description:**

This command causes the TA to hang up the current GSM/UMTS call of the MT with cause.

**Set Command:**

AT+CHUPVT = <cause>
Return: OK

**Parameter:**

<cause>:

1. Unassigned (unallocated) number
3. No route to destination
6. Channel unacceptable
8. Operator determined barring
16. Normal call clearing
17. User busy
18. No user responding
19. User alerting, no answer
21. Call rejected

22. Number changed
25. Pre-emption
26. Non selected user clearing
27. Destination out of order
28. Invalid number format (incomplete number)
29. Facility rejected
30. Response to STATUS ENQUIRY
31. Normal, unspecified
34. No circuit/channel available
38. Network out of order
41. Temporary failure
42. Switching equipment congestion
43. Access information discarded
44. requested circuit/channel not available
47. Resources unavailable, unspecified
49. Quality of service unavailable
50. Requested facility not subscribed
55. Incoming calls barred within the CUG
57. Bearer capability not authorized
58. Bearer capability not presently available
63. Service or option not available, unspecified
65. Bearer service not implemented
68. ACM equal to or greater than ACMmax
69. Requested facility not implemented
70. Only restricted digital information bearer capability is available
79. Service or option not implemented, unspecified
81. Invalid transaction identifier value
87. User not member of CUG
88. Incompatible destination
91. Invalid transit network selection
95. Semantically incorrect message
96. Invalid mandatory information
97. Message type non-existent or not implemented
98. Message type not compatible with protocol state
99. Information element non-existent or not implemented
100. Conditional IE error
101. Message not compatible with protocol state
102. Recovery on timer expiry
111. Protocol error, unspecified
127. Interworking, unspecified

## 4.16. AT+CSTA

**Description:**

Set command selects the type of number for further dialling commands (ATD) according to GSM/UMTS specifications. Test command returns values supported a compound value

**Set Command:**

AT+CSTA=<type>
Return: OK

**Read Command:**

AT+CSTA?
Return: +CSTA: <type>
OK

**Test Command:**

AT+CSTA=?
Return:
+CSTA: (128,129,145,161)
OK

**Parameter:**

<type>
Default value is 129
128：Unknown numbering plan, unknown number
129：ISDN/telephony number plan, unknown number

145：ISDN/telephony number plan, international number
161：ISDN/telephony number plan, national number

**Example:**

AT+CSTA=145
ATD15712345678;
NO CARRIER
ATD+8615712345678;
OK

AT+CSTA=129
ATD15712345678;
OK

**Reference:**

3GPP 27007-730 (Section: 6.1)

## 4.17. AT+CBST

**Description:**

Set command selects the bearer service with data rate and the connection element to be used when data calls are originated (refer 3GPP TS 22.002). Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls (refer +CSNS).

**Set Command:**

AT+CBST=[<speed>[,<name>[,<ce>]]]
Return:
OK

**Read Command:**

AT+CBST?
Return: +CBST: <speed>, <name>, <ce>
OK

**Test Command:**

AT+CBST =?
Return:
+CBST: (list of supported <speed>s), (list of supported <name>s), (list of supported <ce>s)
OK

**Parameters:**

<speed>:
0 autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)
1 300 bps (V.21)
2 1200 bps (V.22)
3 1200/75 bps (V.23)
4 2400 bps (V.22bis)
5 2400 bps (V.26ter)
6 4800 bps (V.32)
7 9600 bps (V.32)
12 9600 bps (V.34)
14 14400 bps (V.34)
15 19200 bps (V.34)
16 28800 bps (V.34)
17 33600 bps (V.34)
34 1200 bps (V.120)
36 2400 bps (V.120)
38 4800 bps (V.120)
39 9600 bps (V.120)
43 14400 bps (V.120)
47 19200 bps (V.120)
48 28800 bps (V.120)
49 38400 bps (V.120)
50 48000 bps (V.120)
51 56000 bps (V.120)
65 300 bps (V.110)

66 1200 bps (V.110)
68 2400 bps (V.110 or X.31 flag stuffing)
70 4800 bps (V.110 or X.31 flag stuffing)
71 9600 bps (V.110 or X.31 flag stuffing)
75 14400 bps (V.110 or X.31 flag stuffing)
79 19200 bps (V.110 or X.31 flag stuffing)
80 28800 bps (V.110 or X.31 flag stuffing)
81 38400 bps (V.110 or X.31 flag stuffing)
82 48000 bps (V.110 or X.31 flag stuffing)
83 56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM)
84 64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)
115 56000 bps (bit transparent)
116 64000 bps (bit transparent)
120 32000 bps (PIAFS32k)
121 64000 bps (PIAFS64k)
130 28800 bps (multimedia)
131 32000 bps (multimedia)
132 33600 bps (multimedia)
133 56000 bps (multimedia)
134 64000 bps (multimedia)
At present, only support 84

<name>:
0 data circuit asynchronous (UDI or 3.1 kHz modem)
1 data circuit synchronous (UDI or 3.1 kHz modem)
2 PAD Access (asynchronous) (UDI)
3 Packet Access (synchronous) (UDI)
4 data circuit asynchronous (RDI)
5 data circuit synchronous (RDI)
6 PAD Access (asynchronous) (RDI)
7 Packet Access (synchronous) (RDI)
At present, only support 1

<ce>:
0 transparent
1 non-transparent
2 both, transparent preferred
3 both, non-transparent preferred
At present, only support 0

**Reference:**

3GPP 27007-730 (Section: 6.7)

## 4.18. AT+CR

**Description：**

The command has replaced modulation reporting control command +MR in V.25ter[14], the latter doesn't suitable to GSM/UMTS networks. Using error control command +ER and data compression command +DR, in V.25ter, could open error control reporting (not radio link protocol)and data compression reporting.

Setting command uses to control whether middle result code will report to TE from TA. If switch on report, the mid result code will transport in a point during process of connecting transmission. At the same time, TA already decided during the process before transmission error control or data compression report, and connection of mid result code.

**Set Command：**

AT+CR=[<mode>]
Return:
OK/ERROR

**Read Command：**

AT+CR?
Return：
+CR： [<mode>]
OK

**Test Command：**

AT+CR=?
Return：
+CR： (list of supported <mode>s)
OK

**Parameter:**

| mode | Description |
|---|---|
| 0 | Disable reporting |
| 1 | Enable reporting |

| Serv | Description |
|---|---|
| ASYNC | Asynchronous transparent transmission services |
| SYNC | Synchronous transparent transmission services |
| REL ASYNC | Asynchronous non-transparent transmission services |
| REL SYNC | Synchronous non-transparent transmission services |
| GPRS [<L2P>] | GPRS services, <L2P> indicates it uses L2 protocol between MT and TE. Please reference GPRS data mode command (+CGDATA) |

**Example：**

AT+CR=1 <cr>
OK

**Reference：**

3GPP 27.007

## 4.19. AT+CEER

**Description：**

Extended error reporting command.
Executing the command, TA will return a line or multi-line information text(s)<report>, determined by MT manufacturers. MT manufacturers provide extended report for TA user as followed reasons：

- Call setup fails (REQ or ACK) or Modification fails after call setup at latest
- call releases at latest
- GPRS attachment fails or PDP context activation fails at latest
- GPRS detachs or PDP context deactivates

**Set Command：**

AT+CEER
Return：
+CEER：<report>
OK

**Test Command：**

AT+CEER=?
Return：
OK

**Parameters：**

| Report | Description |
|---|---|
| 0 | Including row terminator, information text contains 2041 characters at most. And text doesn't contain 0<CR> or OK<CR> |

**Example：**

AT+CEER
+CEER：unacceptable channel
OK

**Reference：**

3GPP 27.007

## 4.20. AT+CRC

**Description：**

The setting command is used to control incoming calls indication, GPRS network request of PDPcontext activation or VBS/VGCS call indication whether using extended format. If using the format, it will actively report result code +CRING：<type> to TE, not to report normal RING.

**Set Command：**

AT+CRC=[<mode>]
Return：
OK/ERROR

**Read Command：**

AT+CRC?
Return：
+CRC：[<mode>]

**Test Command：**

AT+CRC=?
Return：
+CRC：(list of supported <mode>s)

**Parameters：**

| Mode | Description |
|---|---|
| 0 | Disable extended format |
| 1 | Enable extended format |

| Type | Description |
|---|---|
| ASYNC [, <priority> [, <subaddr>, <satype>]] | Asynchronous transparent transmission |
| SYNC [, <priority> [, <subaddr>, <satype>]] | Synchronous transparent transmission |
| REL ASYNC[,<priority>[,<subaddr>,<satype>]] | Asynchronous non-transparent transmission |
| REL SYNC [,<priority>[,<subaddr>,<satype>]] | Synchronous non-transparent transmission |
| FAX [,<priority>[,<subaddr>,<satype>]] | Fax (telecommunications business 62) |
| VOICE [,<priority>[,<subaddr>,<satype>]] | Normal voice business (telecommunications business 11) |
| VOICE/*XXX* [,<priority>[,<subaddr>,<satype>]] | Data following voices (carrying services 81) (*XXX could be ASYNC, SYNC, REL ASYNC or REL SYNC*) |
| ALT VOICE/*XXX* [,<priority>[,<subaddr>,<satype>]] | Voices, data alternately, voice priority (carrying services 61) |
| ALT *XXX*/VOICE [,<priority>[,<subaddr>,<satype>]] | Voices, data alternately, data priority (carrying services 61) |
| ALT VOICE/FAX [,<priority>[,<subaddr>,<satype>]] | Voices, fax alternately, voice priority (carrying services 61) |
| GPRS <PDP_type>, <PDP_addr>[, [<L2P>][,<APN>]] | GPRS network request of PDP context activation |
| VGC <GCA>, <GId>, <ackflag> [,<priority>] | Voice call (telecommunications business 91) |
| VBC <GCA>, <GId>, <ackflag> [,<priority>] | Voice broadcast call (telecommunications business 92) |

**NOTE**：<type> only supports VOICE, ALT XXX/VOICE, and <priority> optional parameters also don't support in current.

**Example：**

AT+CRC=1<CR>
OK
+CRING：VOICE　　//NOTE：voice services
+CRING：VOICE

**Reference：**

3GPP 27.007

## 4.21. AT+CMOD

**Description:**

Set command selects the call mode of further dialling commands (ATD) or for next answering command (A). Mode can be either single or alternating (in the present document, terms "alternating mode" and "alternating call" refer to all GSM/UMTS bearer and teleservices that incorporate more than one basic service (voice, data, fax) within one call). When single mode is selected the call originating and hangup procedures are similar to procedures specified in ITU-T Recommendations V.250 [14], T.31 [11] and T.32 [12]. In GSM/UMTS there can be voice followed by data (refer 3GPP TS 22.002), alternating voice/data (refer 3GPP TS 22.002) and alternating voice/fax calls (refer 3GPP TS 22.003). Refer next two subclauses for alternating call control methods. In the following case, +CMOD is set to 0
1: Power-on
2: Restore factory setting (AT&F)
3: User default setting（ATZ）
4: Alternate mode, call finished successfully
5: Alternate mode, answer fails

**Set Command:**

AT+CMOD=[<mode>]
Return: +CMOD: <mode>
OK

**Read Command:**

AT+CMOD?
+CMOD: <mode>

**Test Command:**

AT+CMOD=?
+CMOD: (0-3)
OK

**Parameter:**

| mode | Description |
|---|---|
| 0 | Single mode |
| 1 | Voice/fax alternate mode |
| 2 | Voice/data alternate mode |
| 3 | Data and voice mode |

Notes: at present, only 0 and 2 are supported

**Example:**

AT+CMOD=2
OK

**Reference:**

3GPP 27007-730 (Section: 6.7)

# 5. Supplementary service commands

## 5.1. AT+CCFC

**Description:**

This command allows control of the call forwarding supplementary service according to 3GPP TS 22.082 . Registration, erasure, activation, deactivation, and status query are supported. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>.

**Set Command:**

AT+CCFC=<reason>, <mode> [, <number> [, <type> [, <class> [, <subaddr> [, <satype> [, <time>]]]]]]

Return:

OK/ERROR

when <mode>=2 and command successful:

+CCFC: <status>, <class1> [, <number>, <type> [, <subaddr>, <satype> [, <time>]]][<CR><LF>+CCFC: <status>, <class2> [, <number>, <type> [, <subaddr>, <satype> [, <time>]]][...]]

**Test Command:**

AT+CCFC=?

Return:

+CCFC: (0-5)

OK

**Parameter:**

| reason | Description |
|---|---|
| 0 | Unconditional |
| 1 | Mobile busy |
| 2 | No reply |
| 3 | Not reachable |
| 4 | All call forwarding |
| 5 | All conditional call forwarding |

| <mode> | Description |
|---|---|
| 0 | Deactivation |
| 1 | Activation |
| 2 | Query |
| 3 | Registration |
| 4 | Erasure |

Number: forwarding number (number character string)

| type | Description |
|---|---|
| 128 | Unknown number type |
| 129 | ISDN number type（default） |
| 145 | International ISDN |
| 161 | National ISDN |

<subaddr>: string type sub-address of format specified by <satype>

<satype>: type of sub-address octet in integer format

| satype | Description |
|---|---|
| 128 | NSAP (X.213/ISO 8348 AD2)（default） |
| 136 | NSAP (X.213/ISO 8348 AD2) |
| 160 | User specific(even number of address signals） |
| 168 | User specific(odd number of address signals) |

Class: a sum of integers each representing a class of information

| class | Description |
|---|---|
| 1 | voice (telephony) |

| | |
|---|---|
| 2 | data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) |
| 4 | fax (facsimile services) |
| 8 | short message service |
| 16 | data circuit sync |
| 32 | data circuit async |
| 64 | dedicated packet access |
| 128 | dedicated PAD access |

< time > : time to wait (5 to 30) in seconds before call is forwarded.
< status > :
0: not active
1: active

**Example:**

AT+CCFC=3, 3, "02150802727", 128
OK

AT+CCFC=3, 1
OK

AT+CCFC=3, 2
+CCFC: 1, 1, "+862150802727", 145
OK

**Reference:**

3GPP 27007-730 (Section: 7.11)

## 5.2. AT+CCWA

**Description:**

This command allows control of the Call Waiting supplementary service according to GSM 02.83. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>,<type>,<class>,[<alpha>][,<CLI validity>] to the TE when call waiting service is enabled Command should be abortable when network is interrogated.

**Set Command:**

AT+CCWA= [<n> [, <mode> [, <class>]]]
Return:
OK or
+CCWA: <status>, <class> (for mode equals to 2)
OK

**Read Command:**

AT+CCWA?
Return:
+CCWA: <n>

**Test Command:**

AT+CCWA=?
Response:
+CCWA: (0-1)
OK

**Parameter:**

<n>
0: disable
1: enable

<mode>:
0: Disable
1: Enable
2: Query status

<class>:
1: voice service
2: data service
4: fax service
128: all services
Notes: Currently, only voice service is supported.

**Reference:**

3GPP 27007-730 (Section: 7.12)

## 5.3. AT+CHLD

**Description:**

This command allows the control of the following call related services:
- A call can be temporarily disconnected from the MT but the connection is retained by the network;
- Multiparty conversation (conference calls);
- The served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection.

**Set Command:**

AT+CHLD=<n>
Return:
OK

**Test Command:**

AT+CHLD=?
Return:
+CHLD: (0-3, 6, 11-17, 21-27, 71-77)
OK

**Parameter:**

| <n> | Description |
|---|---|
| 0 | Release all held calls or set User Determined User Busy(UDUB) for a waiting call |
| 1 | Release all active calls and accepts the other(hold or waiting) call |
| 1X | Release a specific active call |
| 2 | Place all active calls and the waiting calls, activates all held calls |
| 2X | Disconnects a call from the conversation |
| 3 | Adds an held call to the conversation |
| 6 | Releases all existing calls |
| 7X | Releases the specific existing call X |

**Reference:**

3GPP 27007-730 (Section: 7.13)

## 5.4. AT+CLIP

**Description:**

This command refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. Set command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network.

**Set Command:**

AT+CLIP=<n>
Return:
OK/ERROR

**Read Command:**

AT+CLIP?
Return:
+CLIP: <n>, <m>/ ERROR

**Test Command:**

AT+CLIP=?
Return:

+CLIP: (0, 1)
OK

**Parameter:**

| <n> | Description |
|---|---|
| 0 | Disable +CLIP |
| 1 | Enable +CLIP |

| <m> | Description |
|---|---|
| 0 | CLIP not provisioned |
| 1 | CLIP provisioned |
| 2 | Unknown |

**Reference:**

3GPP 27007-730 (Section: 7.6)

## 5.5. AT+CLIR

**Description:**

This command refers to CLIR-service according to 3GPP TS 22.081 that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.
Set command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. If this command is used by a subscriber without provision of CLIR in permanent mode the network will act according 3GPP TS 22.081.

**Set Command:**

AT+CLIR=<n>
Return:
OK /ERROR

**Read Command:**

AT+CLIR?
Return:
+CLIR: <n>, <m>/ ERROR
OK

**Test Command:**

AT+CLIR=?
Return:
+CLIR: (0-2)
OK

**Parameter:**

| <n> | Description |
|---|---|
| 0 | presentation indicator is used according to the subscription of the CLIR service |
| 1 | CLIR invocation |
| 2 | CLIR suppression |

| <m> | Description |
|---|---|
| 0 | CLIR not provisioned |
| 1 | CLIR provisioned in permanent mode |
| 2 | Unknown(e.g .not network) |
| 3 | CLIR temporary mode presentation restricted |
| 4 | CLIR temporary mode presentation allowed |

Notes: At present, setting command is not supported by network.

**Reference:**

3GPP 27007-730 (Section: 7.7)

## 5.6. AT+COLP

**Description:**

This command allows control of the connected line identification presentation supplementary service - useful for call forwarding of the connected line.

**Set Command:**

AT+COLP=<n>
Return:
OK/ERROR

**Read Command:**

AT+COLP?
Return:
+COLP: <n>, <m> / ERROR

**Test Command:**

AT+COLP=?
Return:
+COLP: (0, 1)
OK

**Parameter:**

Notes: Currently, setting command is not supported by network.

| <n> | Description |
|---|---|
| 0 | Deactivate |
| 1 | Active |

| <m> | Description |
|---|---|
| 0 | COLP not provisioned |
| 1 | COLP provisioned |
| 2 | Unknown(no network) |

**Reference:**

3GPP 27007-730 (Section: 7.7)

## 5.7. AT+COLR

**Description**:

This command refers to the GSM/UMTS supplementary service COLR (Connected Line Identification Restriction) that enables a called subscriber to restrict the possibility of presentation of connected line identity (COL) to the calling party after receiving a mobile terminated call. The command displays the status of the COL presentation in the network. It has no effect on the execution of the supplementary service COLR in the network., The command triggers an interrogation of the activation status of the COLR service according 3GPP TS 22.081 (given in <m>). Activation, deactivation, registration and erasure of the supplementary service COLR are not applicable.

**Read Command:**

AT+COLR?
Return:
+COLR: 0, <m> / ERROR

**Test Command:**

AT+COLR=?
Return:
+COLR:
OK
Notes: This command only support read COLR status.

**Parameter:**

| <m> | Description |
|---|---|
| 0 | COLR not provisioned |
| 1 | COLR provisioned |
| 2 | Unknown(no network) |

## 5.8. AT+CACM

**Description:**

Set command resets the Advice of Charge related accumulated call meter value in SIM card or in the active application in the UICC (GSM or USIM) file $EF_{ACM}$. ACM contains the total number of home units for both the current and preceding calls. SIM PIN2 is usually required to reset the value. If setting fails in an MT error, +CME ERROR: <err> is returned.

**Set Command:**

AT+CACM=< password >
Return:
OK

**Read Command:**

AT+CACM?
Return:
+CACM: <ACM>
OK

**Test Command:**

AT+CACM=?
Return:
OK

**Example:**

Set Command:
AT+CACM="1234"
OK

**Parameter:**

<password>: string type; SIM PIN2

**Reference:**

3GPP 27007-730 (Section: 8.25)

## 5.9. AT+CAMM

**Description:**

Set command sets the Advice of Charge related accumulated call meter maximum value in SIM card or in the active application in the UICC (GSM or USIM) file $EF_{ACMmax}$. ACMmax contains the maximum number of home units allowed to be consumed by the subscriber. When ACM (refer +CACM) reaches ACMmax calls are prohibited. SIM PIN2 is usually required to set the value. If setting fails in an MT error, +CME ERROR: <err> is returned.

**Setting Command:**

AT+CAMM=< ACMmax >, <PIN2>
Return:
OK or +ERROR: 16

**Read Command:**

AT+CAMM?
Return:
+CAMM: <ACMmax>
OK

**Test Command:**

AT+CAMM=?
Return:
OK

**Parameter:**

| 〈ACMmax〉 | Description |
|---|---|
| "000000"-"FFFFFF" | - |

<PIN2>: string type; SIM PIN2

**Example:**

AT+CAMM=“001000",”1234”
OK

**Reference:**

3GPP 27007-730 (Section: 8.26)

## 5.10. AT+CPUC

**Description:**

Set command sets the parameters of Advice of Charge related price per unit and currency table in SIM card or in the active application in the UICC (GSM or USIM) file EFPUCT. PUCT information can be used to convert the home units (as used in +CAOC, +CACM and +CAMM) into currency units. SIM PIN2 is usually required to set the parameters. If setting fails in an MT error, +CME ERROR: <err> is returned.

**Set Command:**

AT+CPUC=“<Currency>“,”<Price>“,<PIN2>
Return:
OK/+CME ERROR : <Err>

**Read Command:**

AT+CPUC?
Return:
+CPUC: “<Currency>“, “<Price>“
OK

AT+CPUC=?
Return:
OK

**Parameter:**

| <Currency> | Description |
|---|---|
| string type | three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS |

Currency default value is ““

| <Price> | Description |
|---|---|
| 0-7266 | - |

Price default value is 0

| 〈PIN2〉 | Description |
|---|---|
| string type | SIM PIN2 |

**Reference:**

3GPP 27007-730 (Section: 8.27)

## 5.11. AT+CLCC

**Description:**

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

**Execution Command:**

AT+CLCC
Return:
+CLCC: (if no current calls are available)
OK
or
+CLCC: <id1>, <dir>, <stat>, <mode>, <mpty>, <number>, <type>
OK

**Test Command:**

AT+CLCC=?
Return:
OK

**Parameter:**

<idx> call id

| <dir> | Description |
|---|---|
| 0 | Mobile originated(MO)call |
| 1 | Mobile terminated(MT)call |

| <stat> | Description |
|---|---|
| 0 | Activate |
| 1 | Hold |
| 2 | Dialing(MO) |
| 3 | Alerting(MO) |
| 4 | Incoming(MT) |
| 5 | Waiting(MT) |

| <mode> | Description |
|---|---|
| 0 | Speech（call） |
| 1 | Data（all services） |
| 2 | Fax |
| 9 | Unknown |

| <mpty> | Description |
|---|---|
| 0 | Call is not one of multiparty call parties |
| 1 | Call is one of multiparty call parties |

**Example:**

AT+CLCC
+CLCC: 1, 0, 2, 2, 0, “13888888888”, 129
OK

**Reference:**

3GPP 27007-730 (Section: 7.18)

## 5.12. AT+CUSD

**Description:**

This command allows control of the Unstuctured Supplementary Service Data (USSD). Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation) +CUSD: <m>[,<str>,<dcs>] to the TE. In addition, value <n>=2 is used to cancel an ongoing USSD session. When <str> is given, a mobile initiated USSD-string or a response USSD-string to a network initiated operation is sent to the network. The response USSD-string from the network is returned in a subsequent unsolicited +CUSD result code.

**Set Command:**

AT+CUSD=<n> [ ,<str> [ <dcs> ] ]
Return:
OK

**Read Command:**

AT+CUSD?
Return:
+CUSD: <n>
OK

**Test Command:**

AT+CUSD=?
Return:
+CUSD: (0-2)
OK

**Parameter:**

<n>
0: Disable the indication presentation
1: Enable the indication presentation
2: Cancel USSD service (not applicable to Read Command response)

In case of enable indication presentation, it should be indicated with:
+CUSD: <m> [, <str>, <dcs> ]

<m>
0: no further user action required
1: further user action required
2: USSD terminated by network
4: Operatoin not supported

<str> Text

<dcs> :
0: GSM 7 bit default alphabet; message preceded by language indication.
1: UCS2; message preceded by language indication

Sent or received USSD format:
AT+CUSD=<n> [, <str> [, <dcs>]]
Notes: Users should initiate USSD service, AT+CUSD=1, "*188#", etc. Then network will response related information +CUSD:**** , users could select corresponding service to communicate with network. Finally, users could use AT+CUSD=2 or AT+SAC to stop present USSD service (former USSD service must be stopped, before initiating new USSD service.）

**Example:**

AT+CUSD=1,"*126#"
+CUSD:1,0031002E6211768479EF5206000A0032002E79EF52066362793C54C1000A0033002E51
516362901A8BDD65F695F4000A0034002E79EF52067ADE6807000A0035002E79EF5206535A595
6000A0036002E79EF52065145503C000A0023002E900051FA, 72
OK

AT+CUSD=1,"1" // select menu's first item
+CUSD: 1,0030002E67E58BE254115BFC000A0031002E79EF520667E58BE2000A0032002E51658
D264EA4661367E58BE2000A0033002E51FA8D264EA4661367E58BE2000A002A002E8FD456DE
00200023002E900051FA, 72
OK

**Reference:**

3GPP 27007-730 (Section: 7.15)

## 5.13. AT+CSSN

**Description:**

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. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.
When <m>=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: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] 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 <code2>s are received from the network, each of them shall have its own +CSSU result code.

**Set Command:**

AT+CSSN=< n >, <m>
Return:
OK/ERROR

**Read Command:**

AT+CSSN?
Return:
+CSSN: < n >, <m>

**Test Command:**

AT+CSSN=?
Return:

+CSSN: (0, 1), (0, 1)
OK

**Parameter:**

| <n> | Description |
|---|---|
| 0 | Disable |
| 1 | Enable |

| <m> | Description |
|---|---|
| 0 | Disable |
| 1 | Enable |

| <code1> | Description |
|---|---|
| 0 | Unconditional forwarding activated |
| 1 | Some conditional forwarding activated |
| 2 | Call has been forwarded |
| 3 | Call has been put on hold |
| 4 | Closed user groups with restricted access(CUG) |
| 5 | Outgoing calls are barred |
| 6 | Incoming calls are barred |
| 7 | CLIR rejected |

| <code2> | Description |
|---|---|
| 0 | Belong to call forwarding(MT) |
| 1 | Belong to Closed User Group (CUG)call |
| 2 | Call has been held |
| 3 | Call has been retrieved |
| 4 | Multiparty call entered |
| 5 | Call on held has been released |
| 7 | Call is being connected(alerting) with other remote party in multiparty conversation |
| 8 | Call has been connected with the other remote party in multiparty conversation |

**Reference:**

3GPP 27007-730 (Section: 7.17)

## 5.14. AT+CAOC

**Description：**

The command is used to inquire call counter(call accounting), open or close the function of inquiring call accounting

**Set Command：**

AT+CAOC[=<mode>]
Return：
+CAOC：<ccm>
OK

**Read Command：**

+CAOC?
Return：
+CAOC：<mode>

**Test Command：**

+CAOC=?
Return：
+CAOC：(list of supported <mode>s)
OK

**Parameter：**

| <mode> | Description |
|---|---|
| 0 | Inquire the value of CCM |
| 1 | Close CCM reporting |
| 2 | Activate CCM reporting |

## 5.15. AT+CCWE

**Description：**

The command is used to set and inquire the function of call upper limit whether to report

**Set Command：**

AT+CCWE[=<mode>]
Return：
OK/ERROR

**Read Command：**

+CCWE?
Return：
+CCWE：<mode>

**Test Command：**

+CCWE=?
Return：
+CCWE：(list of supported <mode>s)
+CME ERROR：<err>

**Parameter：**

| <mode> | Description |
|---|---|
| 0 | Close call upper limit reporting |
| 1 | Activate call upper limit reporting |

NOTE：if activate call upper limit reporting, it will report by +CCWV

# 6. Security Commands

## 6.1. AT+CPIN

**Description:**

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. 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

Read command returns an alphanumeric string indicating whether some password is required or not.

**Set Command:**

AT+CPIN=<pin>
or
AT+CPIN=<puk>, <newpin>
Return:
OK/+CME ERROR: <err>

**Read Command:**

AT+CPIN?
Return:
+CPIN: < code>
OK

**Test Command:**

AT+CPIN=?
Return:
OK

**Paramter:**

<pin>, <newpin>: string type values
<puk>: length is 8 digits.

| <code> | Description |
|---|---|
| READY | MT is not pending for any password |
| SIM PIN | MT is waiting SIM PIN to be given |
| SIM PUK | ME is waiting SIM PUK to be given |
| SIM PIN2 | MT is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation) |
| SIM PUK2 | MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation) |
| BLOCK | Locked |

**Example:**

AT+CPIN?
+CPIN: SIM PUK
OK

AT+CPIN=12345678, 2345 // PIN1 is modified to”2345”
OK

AT+CPIN?
+CPIN: SIM PIN
OK

AT+CPIN=2345
OK

AT+CPIN?

+CPIN: READY
OK

**Reference:**
3GPP 27007-730 (Section: 8.3)

## 6.2. AT+CPWD

**Description:**
Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK. Refer subclause 5.2 for possible <err> values.
Test command returns a list of pairs which present the available facilities and the maximum length of their password.

**Set Command:**
AT+CPWD=<fac>, <oldpwd>, <newpwd>
Return:
OK/+CME ERROR: <err>

**Test Command:**
AT+CPWD=?
Return:
+CPWD: (“PS”,8), (“SC”,8), (“AO”, 4), (“OI”, 4), (“OX”, 4), (“AI”, 4), (“IR”, 4), (“AB”, 4), (“AG”, 4), (“AC”, 4), (“P2”, 8), (“FD”,8), (“PN”, 8), (“PU”, 8), (“PP”, 8), (“PC”, 8)
OK

**Paramter:**
<fac> :
“PS” SIM is locked, password is 8 digits;
“SC” PIN enabled/disabled;
“AO” Barr all outgoing calls;
“OI” Barr all outgoing international calls;
“OX” Barr all outgoing international calls, except to Home Country;
“AI” Barr all incoming calls;
“IR” Barr all calls. When roaming outside Home Country;
“AB” All barring service;
“AG” All outgoing barring service;
“AC” All incoming barring service;
“PN” Network lock with 8 digits password;
“PU” Network subset lock with 8 digits password;
“PP” Service provider lock with 8 digits password;
“PC” Corporate lock with 8 digits password;
“FD” SIM Fixed FDN Dialing lock, PIN2 is required as a password；
“P2” PIN2 lock.

**Example:**
AT+CPWD=“AI”, 1234, 1111
OK

**Reference:**
3GPP 27007-730 (Section: 7.5)

## 6.3. AT+CLCK

**Description:**
This command locks, unlocks, and negotiates the facilities between mobile and network.

**Set Command:**
AT+CLCK=<fac>, <mode> [, <password> [, <class>]]
Return:
OK/+CME ERROR: <err>/+CLCK: <status> [, <class>] (when mode=2, it’s in inquiry status.)

**Read Command:**
AT+CLCK?
Return:
+CLCK (list all supported<fac>s, list corresponding <status>s)
OK

**Test Command:**

AT+CLCK=?
Return:
+CLCK (list all supported<fac>s)

**Parameter:**

| fac | Description |
|---|---|
| “PS” | SIM lock with a 8 digits password； |
| “SC” | PIN enable/disable； |
| “AO” | Barr all outgoing calls； |
| “OI” | Barr all outgoing international calls； |
| “OX” | Barr all outgoing international calls, except to Home Country； |
| “AI” | Barr all incoming calls； |
| “IR” | Barr all call, when roaming outside Home Country； |
| “AB” | All barring services； |
| “AG” | All outgoing barring services； |
| “AC” | All incoming barring services； |
| “PN” | Network lock with a 8 digits password； |
| “PU” | Network subset lock with 8 digits password； |
| “PP” | Service provider lock with a 8 digits password； |
| “PC” | Corporate lock with a 8 digits password； |
| “FD” | SIM fixed FDN dialing lock, PIN2 is required as a password； |

| mode | Description |
|---|---|
| 0 | Unlock this facility |
| 1 | Lock this facility |
| 2 | Query status |

| class | Description |
|---|---|
| 1 | Voice （telephony） |
| 2 | data（to all bear service） |
| 4 | Fax |
| 8 | Short message service |
| 7 | All classes, default value |

<status>
0: deactivate
1: activate

<password>: (0-9)characters, the maximum length determined by command( AT+CPWD=?).

**Reference:**

3GPP 27007-730 (Section: 7.4)
AT+XX

**Description:**

This command is used to get the remaining times of valid attempts for PIN and PUK.

**Set Command:**

AT+XX=<value>
Return:
+XX: <remaining_num>
OK

**Parameter:**

<value>

| value | Description |
|---|---|
| 0 | PIN 1 |
| 1 | PIN 2 |
| 2 | PUK 1 |
| 3 | PUK 2 |

**Example:**

AT+XX=0
+XX: 3
OK

**Reference:**
3GPP 27007-730 (Section: 7.4)

## 6.4. AT+ERGA

**Description:**
This command is used to get SIM's GSM authentication, through inputted rand value to get kc and sres key password

**Set Command:**
AT+ERGA=<rand>
Return:
+ERGA: <sres>, <kc>

**Test Command:**
AT+ERGA=?
Return:
+ERGA: <rand> (16 bytes, string type values)
OK

**Parameter:**
<rand>: random character strings which consist of hexadecimal numbers and double quotation marks.
<sres>: character strings which consist of hexadecimal numbers and double quotation marks. The string is used to compute the user response
<kc>: character strings which consist of hexadecimal numbers and double quotation marks. the strings is used in Encryption algorithm A5

**Example:**
AT+ERGA="F93FDD34F93FDD34F93FDD34F93FDD34"
+ERGA:"EFAD","33FFABED"
OK
Note: about the variables rename rule, refer to 3GPP TS 51.011

**Reference:**
OMS RIL AT Interface (Section 7.27)

## 6.5. AT+ERTCA

**Description:**
This command is used to check the authentication for USIM's 3G context, through< rand> and <aunt > to get the information < res/auts>, <ck>, <ik>.

**Set Command:**
AT+ERTCA= <rand>, <autn>
Return
+ERTCA: <status>, [<res/auts> [, <ck>, <ik> [, <kc>]]]
OK /+CME ERROR: <err>

If status=0, Return
+ERTCA:0,res,ck,ik /+ERTCA:0,res,ck,ik,kc

If status=1, Return
+ERTCA: 1, <auts>

If status=2, 3 Return
+ERTCA: 2 / +ERTCA: 3

**Test Command:**
AT+ERGA=?
+ERGA: <rand>, <autn> (<rand>: 16 bytes, string type values, <autn>: string type values)
OK

**Parameter:**
<rand> : random character strings which consist of hexadecimal numbers and double quotation marks

<autn> : the Parameters for authentication , character strings which consist of hexadecimal numbers and double quotation marks

<status >
0: success
1: synchronization failure
2: authentication failure, invalidate MAC (status word: '9862')
3: not supported security context (status word: '9864')

<res> the response from user , character strings which consist of hexadecimal numbers and double quotation marks

<auts> authentication failure information, character strings which consist of hexadecimal numbers and double quotation marks

<ck> encryption key , character strings which consist of hexadecimal numbers and double quotation marks

<ik> integrity key, character strings which consist of hexadecimal numbers and double quotation marks

<kc> character strings which consist of hexadecimal numbers and double quotation marks. the strings is used in Encryption algorithm A5

**Reference:**

OMS RIL AT Interface (Section 7.28)

## 6.6. AT+ECPIN2

**Description：**

The command is used to input or modify PIN2 code.

**Set command：**

AT+ECPIN2=<pin2> or AT+ECPIN2=<puk2>, <new pin2>
Return：
OK
+CME ERROR：<err>

**Read command：**

AT+ECPIN2?
Return：
+ECPIN2：<code>
OK

**Parameter：**

<pin2>： 4 - 8 numbers
<new pin2>：4 – 8 numbers
<puk2>： 8 numbers
<code>：
READY： don’t need to input
SIM PIN： nvalid
SIM PUK：invalid
SIM PIN2：input PIN2 code. <ME is waiting for SIM PIN2>
SIM PUK2：input PUK2 code <ME is waiting for SIM PUK2>
BLOCK：locking

**Example:**

AT+ECPIN2?
+ECPIN2：SIM PUK2
AT+ECPIN2=12345678, 2345 //modify PIN2 to”2345”
OK

AT+ECPIN2?
+ECPIN2：SIM PIN2

AT+ECPIN2=2345
OK

AT+ECPIN2?
+ECPIN2：READY

# 7. Short Message Commands

## 7.1. AT+CSMS

**Description:**

Set command selects messaging service <service>. It returns the types of messages supported by the ME. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned.
Read command returns supported message types along the current service setting.
Test command returns a list of all services supported by the TA.

**Set Command:**

AT+CSMS=<service>
Return:
+CSMS=<mo>,<mt>,<bm>
OK

**Read Command:**

AT+CSMS?
Return:
+CSMS: <service>, <mo>,<mt>,<bm>
OK

**Test Command:**

AT+CSMS=?
Return:
+CSMS: (0-1)
OK

**Parameter:**

<service>:
0: SMS AT commands are compatible with GSM07.05 PHASE 2
1: SMS AT commands are compatible with GSM07.05 PHASE 2+

<mo>: for mobile originated messages
0: type not supported
1: type supported

<mt>: for mobile terminated messages
0: type not supported
1: type supported

<bm>: for broadcast type messages
0: type not supported
1: type supported

Notes: Currently, GSM07.05 PHASE 2 and GSM07.05 PHASE 2+ are not distinguished.

**Reference:**

3GPP 27005(Section 3.2.1)

## 7.2. AT+CSAS

**Description:**

Execution command saves active message service settings to a non-volatile 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 saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore cannot be saved.

**Execution Command:**

AT+CSAS
Return:
OK

**Reference:**

3GPP 27005(Section 3.3.5)

## 7.3. AT+CRES

**Description:**

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 cannot be restored.

**Execution Command:**

AT+CRES
Return:
OK

**Reference:**

3GPP 27005(Section 3.3.6)

## 7.4. AT+CSDH

**Description:**

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

**Set Command:**

AT+CSDH=[<show>]
Return:
OK

**Read Command:**

AT+CSDH?
Return:
+CSDH: <show>
OK

**Test Command:**

AT+CSDH=?
Return:
+CSDH: (list of supported <show>s)
OK

**Parameter:**

| show | Description |
|---|---|
| 0 | do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata> |
| 1 | show the values in result codes |

**Reference:**

3GPP 27005(Section 3.3.3)

## 7.5. AT+CPMS

**Description:**

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned.

Test command returns lists of memory storages supported by the TA.

**Set Command:**

AT+CPMS=<mem1>[, <mem2>, [<mem3>]]
Return:
+CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3>,

OK

**Read Command:**

AT+CPMS?
Return:
+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>
OK

**Test Command:**

AT+CPMS=?
Return:
+CPMS: (("ME","SM"),(“ME”,"SM”)) ,("ME",”SM”))
OK

**Parameter:**

<mem1>: Memory for the messages which are read and deleted
<mem2>: Memory for the messages which are written and sent
<mem3>: Memory for the message which are received
<usedx>: the used space of <memx>
< totalx>: total space of < memx >
“SM” SIM storage
“ME” NV storage
Notes: Currently support only “SM” and “ME”.

**Example:**

AT+CPMS="ME"
Return:
+CPMS: 0,0,12,20,12,20
OK

**Reference:**

3GPP 27005(Section 3.2.2)

## 7.6. AT+CSCA

**Description:**

Set command updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

**Set Command:**

AT+CSCA=<sca> [, <tosca>]
Return:
OK

**Read Command:**

AT+CSCA?
Return:
+CSCA: <sca>, <tosca>
OK

**Test Command:**

AT+CSCA=?
Return:
OK

**Parameter:**

<sca>: service center address, {0-9, *, #, +, a, b, c}, its maximum length is 20
<tosca>: service center address format, protocol (3GPP 24.011 )uses 8-bit address integer

**Example:**

AT+CSCA?
+CSCA: "+8613800230500", 145
OK

AT+CSCA="8613800230500"
OK

AT+CSCA=?
OK

**Reference:**

3GPP 27005(Section 3.3.1)

## 7.7. AT+CMGF

**Description:**

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Read command returns current setting value.

Test command returns supported modes as a compound value.

**Set Command:**

AT+CMGF=<mode>
Return:
OK

**Read Command:**

AT+CMGF?
Return:
+CMGF=<mode>
OK

**Test Command:**

AT+CMGF=?
Return:
+CMGF: (0, 1)
OK

**Parameter:**

| mode | Description |
|---|---|
| 0 | PDU mode (default when implemented) |
| 1 | Text mode |

**Example:**

AT+CMGF?
+CMGF: 0
OK

AT+CMGF=1
OK

**Reference:**

3GPP 27005(Section 3.2.3)

## 7.8. AT+CMGL

**Description:**

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. about text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

Test command shall give a list of all status values supported by the TA.

**Set Command:**

AT+CMGL[=<stat>]
Text mode：

+CMGL: <index>, <stat>, <oa/da>, [<alpha>], [<scts>] [, <tooa/toda>, <length>] <CR><LF> <data> (for SMS-SUBMIT)
+CMGL: <index>, <stat>, <da/oa>, [<alpha>], [<scts>] [,<tooa/toda>, <length>]<CR> <LF><data>(for SMS-DELIVER)
+CMGL: <index>, <stat>, <fo>, <mr>, [<ra>], [<tora>], <scts>, <dt>,<st>(for SMS-STATUS-REPORT)

PDU mode：
+CMGL: <index>, <stat>,, <length>, <CR> <LF><pdu> (for SMS-DELIVER, SMS-SUBMIT and SMS-ATATUS-REPORT).

NOTE: For some sprd branch in PDU mode there is one more "," between <stat> and <length>;
AT+CMGL=4
+CMGL: 1,0,,84

**Test Command:**

AT+CMGL=?
Return:
+CMGL: (list of supported <stat>s)
OK

**Parameter:**

<index>: integer type; value in the range of location numbers supported by the associated memory
<stat>: integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

| <stat> Text mode | <stat> PDU mode | Description |
|---|---|---|
| "REC UNREAD" | 0 | Unread message |
| "REC READ" | 1 | read message |
| "STO UNSENT" | 2 | Stored and unsent message |
| "STO SENT" | 3 | Stored and sent message |
| "ALL" | 4 | All short message |

<oa>: TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <tooa>

<da>: TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <toda>

<alpha>: string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS

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

<tooa >: TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)

<toda >: TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)

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

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

Format :
if <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set:

- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A

- if TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55))

- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

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

<mr>: TP-Message-Reference in integer format

<ra>: TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <tora>

<tora>: TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)

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

<dt>: TP-Discharge-Time in time-string format: "yy/MM/dd, hh:mm: ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06, 22:10:00+08"

<st>: TP-Status in integer format

<dcs>: character set–type

| dcs | Description |
|---|---|
| 0 | Default type（7Bit） |
| 1 | 8BIT |
| 2 | UCS2 (Eg.Chinese ) |

**Example:**

Set to PDU mode
AT+CMGF=0
OK

Show all short messages
AT+CMGL=4
+CMGL: 1, 2, 21
0891683108200305F0114A0481111100008F0CD3E594B85C1297C4257109
+CMGL: 2, 2, 24
0891683108200305F0314A0B803118665868F50008AD0A00680065006C006C006F
+CMGL: 3, 1, 13
018000008000000000000000000000
OK

Set to text mode
AT+CMGF=1
OK

Show all short messages
AT+CMGL="ALL"
+CMGL: 1,"REC READ", "", "00/00/ 00, 00:00:00+00"
+CMGL: 2,"REC READ", "", "00/00/00, 00:00:00+00"
+CMGL: 3,"STO UNSENT","1111", 43200 SKSDKKDKDKDK
+CMGL: 4,"STO UNSENT","13816685865", 604800
00680065006C006C006F
+CMGL: 5,"REC READ","12581", "04/05/13,11:43:06+00"
975E5E3853EF4E50003A7532003A4E456CA180547EDC7684540C5B664E0076F45411621163A89500
4E005957767E79D151684E66FF0C70E6FF0162115C3176F463A57ED94ED68BF4201C5C1167658FD9
4E005957201D4E59003A4ED667094EC04E4853CD5E94FF1F7532003A7ED3679C4ED653C84ECB7EC
D621153E64E0059573002
OK

**Reference:**

3GPP 27005(Section 3.4.2 /4.1)

# 7.9. AT+CMGR

**Description:**

This command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned.

**Set Command:**

AT+CMGR=<index>
Text mode return:
+CMGR:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,
<sca>, <tosca>, <length>] <CR><LF><data> (for SMS-DELIVER only)
+CMGR:<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],
<sca>, <tosca>,<length>]<CR><LF><data> (for SMS-SUBMIT only)
+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (for SMS-STATUS-REPORT）

PDU mode return:
+CMGL: <index>, <stat>, <length>, <CR> <LF>
<PDU>

Notes: Regard the status report as ordinary MT message.

**Parameter:**

<index>: location in memory
<stat>: message status

| <stat> Text mode | <stat> PDU mode | Description |
|---|---|---|
| “REC UNREAD” | 0 | Unread message |
| “REC READ” | 1 | Read message |
| “STO UNSENT” | 2 | Storage and unsent message |
| “STO SENT” | 3 | Storage and sent message |
| “ALL” | 4 | All message |

<alpha>: character ; if alphanumeric mixed encoding mode, correspond to MT phonebook records ‘s item: (<da> or <oa> ), the application is related with Manufacturer , the character set is same as character set selected by command (+CSCS) .refer to the definition of 3GPP 27.007
<da>: destination address
<oa>: source address
<ra>: recipient-address
<scts>: service-centre-time-stamp
<tooa>: type of originating-Address
<fo>: depending on the command or result code:
<pid>: protocol-Identifier
<dcs>: character set–type
<sca>: service center address
<tosca>:type of service center address
<length>: integer type value indicating the length of the message body <data>
<data>: text content
<vp>: validity period
<mp>: message reference
<dt>: discharge time

**Example:**

AT+CMGF=1
OK

AT+CMGR=1
+CMGR: "REC UNREAD","1050000", ,"04/24/17,27:46:32+10"
617468794261746879436174687943617468794361746879426174687943617468794361746879436174687943617468
7942617468794
OK

AT+CMGR=4
+CMGR: "REC READ","+8615710126408", "10/02/21, 15:18:52+32"
7ED590538DEF4E0A6D77591656FD5BB65EAD96626821957F671F95F463A553D752304E865417
76848BDD8BF4660E663E793A830356F4
OK

AT+CSDH=1
OK

AT+CMGR=4
+CMGR: "REC READ","+8615710126408", "10/02/21, 15:18:52+32", 145, 60, 0, 2,"+8613800
210500", 145, 54
7ED590538DEF4E0A6D77591656FD5BB65EAD96626821957F671F95F463A553D752304E865417
76848BDD8BF4660E663E793A830356F4
OK

**Reference:**

3GPP 27005(Section 3.4.3/4.2)

## 7.10. AT+CMGS

**Description:**

This command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned.

If the format of sending message is text mode (AT+CMGF=1):

**Set Command:**

AT+CMGS=<da> [, <toda>] <CR>
> TEXT <ctrl+Z/ESC>
If the format of sending command is PDU mode (AT+CMGF=0):

**Set Command:**

AT+CMGS=<length><CR>
> PDU <ctrl-z/ESC>
Return:
+CMGS: <mr>
OK

**Test Command:**

AT+CMGS=?
Return:
OK

**Parameter:**

<length>: the length of TPDU（bit）with a range of 9-160
PDU: It consists of <Service Center Id>（00 means no service center id） and <TPDU>. Its <Service Center Id > refers to GSM 04.11, and its <TPDU> to GSM 03.40. The 16 bit TPDU must be changed into two ASCII characters. For example, 0X2A is changed to 2（ASCII 50）and A（ASCII 65）.The length range is 18-502.
<da>: destination address with a maximum length of 40
<tooa/toda>: type of destination address
128: Unknown numbering plan, unknown number
129: ISDN/telephony number plan, unknown number
145: ISDN/telephony number plan, international number
161: ISDN/telephony number plan, national number
Text: content ahead（0…9,A…F）, if dcs(set by AT+CSMP) is a 7Bit ASCII character, its length range is 0-160;
If dcs is a 8Bit ASCII character, its length range is 0-140；If dcs is a UCS2 character, its length range is 0-140；

**Example:**

PDU MODE:
AT+CMGS=16
> /*return an arrow*/
0031020b803119282071f30008000500680065006c006c006f<ctrl-z> /*input pdu*/

00 - no service center address
31 - <fo>
02 - <mr> (TP -MR)

0B8031192820 71f3 - <da> (TP -DA)（13918202173）
00 - <pid> (TP -PID)
08 - <dcs> (TP -DCS)
0005 - <length> (TP -UDL)
00680065006c006c006f - TP –UD（hello）

AT+CMGS=24
> /*return an arrow*/
0891683108200105f031020b803119282071f30008ad0a00680065006c006c006f<ctrl-z>

08 - the length of service center id
91683108200105f - The service center id +8613800210500

TEXT MODE:
AT+CSCS="IRA"
AT+CMGS="13888888888"
> /*return an arrow*/
hello <ctrl-z>

Examples of sending UCS2 characters
AT+CMGF=1
OK

AT+CSMP=19, 143, 0, 2 （<dcs> is sent to UCS2）
OK

AT+CMGS="13918928066"
> /*return an arrow*/
4F60597D<ctrl-z>
OK

**Reference:**

3GPP 27005(Section 3.5.1/4.3)

## 7.11. AT+CSMP

**Description:**

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in 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 with double quotes.

**Set Command:**

AT+CSMP=<fo>, <vp>, <pid>, <dcs>
Return:
OK / +CMS ERROR: <err>

**Read Command:**

AT+CSMP?
Return:
+CSMP: <fo>, <vp>, <pid>, <dcs>

**Test Command:**

AT+CSMP=?
Return:
+CSMP: (0-255), (0-255), (0-9, 11, 12,127), (0-2)
OK

**Parameters:**

<fo>: First Octet, code according to the Description below. The default value is 19.

| b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
|---|---|---|---|---|---|---|---|
| RP | UDHI | SRR | VPF | | RD | MTI | |

RP : Reply path, invalid in text mode.

UDHI: User Data Header Information.

SRR : Status Report Request. b5=1, if a status report is requested.

VPF : Validity Period Format
b4=0 & b3=0 → <vp> field is not present
b4=1 & b3=0 → <vp> field is present in relative format
Other formats are not supported.

RD: Reject Duplicates, b2=1 to instruct the SC to reject an SMS-SUBMIT for and SM still held in the SC which has the same <mr> and the same <da> from the same <oa>.

MTI: Message type indicator
b1=0 & b0=0 → SMS-DELIVER (in the direction SC to MS)
b1=0 & b0=1 → SMS-SUBMIT (in the direction MS to SC)

<vp> validity period with a default value of 143
0 to 143: (VP + 1) x 5 minutes (the maximum period is 12 hours)
144 to 167: 12 hours + ((VP. 143) x 30 minutes)
168 to 196: (VP. 166) x 1 day
197 to 255: (VP. 192) x 1 week

<pid> is used to indicate the higher layer protocol being used or indicates interworking of a certain type of telematic device. Its default value is 0.
0 implicit - device type is specific to this SC, or can be concluded on the basis of the address
1 telex (or teletex reduced to telex format)
2 group 3 telefax
3 group 4 telefax
4 voice telephone (i.e. conversion to speech)
5 ERMES (European Radio Messaging System)
6 National Paging system (known to the SC)
7 Videotex (T.100/T.101)
8 teletex, carrier unspecified
9 teletex, in PSPDN
11 teletex, in analog PSTN
12 teletex, in digital ISDN
7F SIM DOWNLOAD
Coding Description of <dcs> information with a default value of 0.

| DCS | Description |
|---|---|
| 0 | default alphabet |
| 1 | 8 bit data |
| 2 | UCS2 |

**Example:**

AT+CSMP=19, 143, 0, 0
OK

AT+CSMP?
+CSMP: 19, 143, 0, 0
OK

**Reference:**

3GPP 27005(Section 3.3.2)

## 7.12. AT+CMGW

**Description:.**

This command stores message (either SMS-DELIVER or SMS-SUBMIT) 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. The entering of text is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned.

**Set Command:**

If the SM format is PDU mode:

AT+CMGW=<length>[,<stat>]<CR>
> /*return an arrow*/
PDU is given <ctrl-Z/ESC>
Return:
+CMGW: <index>

OK

If the SM format is TEXT mode:

AT+CMGW="<oa/da>",[<tooa/toda>[,<stat>]]<CR>
>  /*return an arrow*/
TEXT is given <ctrl-Z/ESC>
Return:
+CMGW: <index>
OK

**Parameter:**

<length>: the length of TPDU(bit) with a range of 9-160

<oa/da>: destination address with the maximum length of 40 bits.

<tooa/toda>: type of destination address
128: Unknown numbering plan, unknown number
129: ISDN/telephony number plan, unknown number
145: ISDN/telephony number plan, international number
161: ISDN/telephony number plan, national number

< stat >: integer: 0: Unread Message. (MT)
1: Read Message. (MT)
2: Unsent Message. (MO)
3: Sent Message. (MO)

< index>: index id of <mem2>
<PDU>: same to AT+CMGS
<Text>: same to AT+CMGS

**Example**

AT+CMGF=1
OK
AT+CMGW="13918928088"
>  /*return an arrow*/
TEST <ctrl-Z>
+CMGW: 16
OK

**Reference:**

3GPP 27005(Section 3.5.3/4.4)

## 7.13. AT+CMSS

**Description:**

This 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. Optionally (when +CSMS <service> value is 1 and network supports) <ack pdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned.

**Set Command:**

AT+CMSS=<index> [,"<da>" [, "<toda>"] ]
Return:
+CMSS: <mr>
OK

**Test Command:**

AT+CMSS=?
Return:
+CMSS: (1-255),,
OK

**Parameter:**

<index>: index num of SIM
<da>: destination address with a maximum length of 40

<toda>
128: Unknown numbering plan, unknown number
129: ISDN/telephony number plan, unknown number
145: ISDN/telephony number plan, international number
161: ISDN/telephony number plan, national number

**Example:**

AT+CMGF=1
OK
AT+CMGW="13918928088"
>
TEST <ctrl-Z>
+CMGW: 16
OK

AT+CMSS=16
OK

**Reference:**

3GPP 27005(Section 3.5.2/4.7)

## 7.14. AT+CMGD

**Description:**

This command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, final result code +CMS ERROR: <err> is returned.

Test command shows the valid memory locations and optionally the supported values of <delflag>

**Set Command:**

AT+CMGD=<index>[, <DelFlag>]
Return:
OK / ERROR

**Test Command:**

AT+CMGD=?
Return:
+CMGD: (1-255), (0-4) Supposed maximum number of SM storage for SMS is 255
OK

**Parameter:**

<index>: index num of chosen memory <mem1>, which should be less than the maximum num item of <mem1>

| <DelFlag> | Description |
|---|---|
| 0 | 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. |

Notes: When <DelFlag>is between 1 and 4 and when <index> is omitted.

**Reference:**

3GPP 27005(Section 3.5.4)

## 7.15. AT+CSCB

**Description:**

Set command selects which types of CBMs are to be received by the ME.
Test command returns supported modes as a compound value.
Notes: This command is allowed in TEXT mode.

**Set Command:**

AT+CSCB=<mode>, <mid>, <dcs>
Return:
OK

**Read Command:**

AT+CSCB?
Return:
+CSCB=<mode>, <mids>, <dcss>

**Test Command:**

AT+CSCB=?
Return:
+CSCB: (0,1)
OK

**Parameter:**

| <mode> | Description |
|---|---|
| 0 | message types specified in <mid> and <dcs> are accepted |
| 1 | message types specified in <mid> and <dcs> are not accepted |

<mid>: string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320-478,922"

<dcs>: string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"

**Reference:**

3GPP 27005(Section 3.3.4)

## 7.16. AT+CNMI

**Description:**

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP TS 23.038 [2].

**Set Command:**

AT+CNMI=<mode>, <mt>, <cbm>, <ds>, <bfr>
Return:
OK/ ERROR

**Test Command:**

AT+CNMI=?
Return:
+CNMI: (0-3), (0-3), (0-3), (0-2), (0-1)
OK

**Read Command:**

AT+CNMI?
Return:
+CNMI: 3, 0, 0, 0, 0
OK

**Parameter:**

<mode> : controls the processing of unsolicited result codes specified within this command. Default value is 3. Currently only mode 3 is supported.

| mode | Description |
|---|---|
| 3 | Return result code to DTE |

<mt>:set the indication format of MT message with a default value of 0

| mt | no class or class 1 | class 0 or message waiting indication group (discard) | class 2 or message waiting indication group (store) | class 3 |
|---|---|---|---|---|
| 0 | No indication No | No indication No | No indication No | No indication No SMS-DELIBER |

| | | | | |
|---|---|---|---|---|
| | SMS-DELIBER | SMS-DELIBER | SMS-DELIBER | |
| 1 | Auto-indication +CMTI: <mem>, <index> | Auto-indication +CMTI: <mem>, <index> | Auto-indication +CMTI:<mem>, <index> | Auto-indication +CMTI:<mem>, <index> |
| 2 | Direct indication +CMT: result code. | Direct indication +CMT: result code. | Direct indication +CMTI: <mem>, <index> | Direct indication +CMT: result code. |
| 3 | Auto-indication +CMTI:<mem>, <index> | Auto-indication +CMTI:<mem>,<index> | Auto-indication +CMTI:<mem>,<index> | Auto-indication +CMT:result code. |

<cbm>: Configure the indication of cell broadcast message. Its default value is 0.

| cbm | Description |
|---|---|
| 0 | No CBM indications are routed to the TE. The CBMS are stored. |
| 1 | The CBM is stored and an indication of the memory location is routed to the user |
| 2 | Reserved (at present, handling as defined in <cbm>=1) |
| 3 | Reserved (at present, handling as defined in <cbm>=1) |

<ds>: Configure the indication for SM status report. Its default value is 0.

| ds | Description |
|---|---|
| 0 | No SMS-STATUS-REPORTS are routed |
| 1 | SMS-STATUS-REPORTS are routed using unsolicited result code:<br>+CDS: <length><CR><LF><pdu> (PDU mode enabled); or<br>+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled) |
| 2 | If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code：<br>+CDSI: <mem>,<index> |

<bfr> Its default value is 0.

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

**Example:**

```
AT+CNMI=3, 0, 1, 1
OK

AT+CNMI?
+CNMI: 3, 0, 1, 1, 0
OK
```

**Reference:**

3GPP 27005(Section 3.4.1)

## 7.17. +CMTI

**Description:**

+CMTI indicates the memory location which will be routed to the TE. (Enabled by AT+CNMI)

unsolicited result code format:
+CMTI: <mem>, <index>

**Parameter:**

| <mem> | Description |
|---|---|
| “SM” | SM message storage |
| “ME” | ME message storage |

<index>: the index num of <mem>

**Reference:**

3GPP 27005(Section 3.4.1)

## 7.18. +CMT

**Description:**

+CMT indicates the short message was sent to DTE directly after received. ( command AT+CNMI=3,2 should be set first)

If the mode of short message is PDU mode (AT+CMGF=0)

unsolicited result code format:
+CMT: [<reserved>], <length><CR><LF><pdu><CR><LF>

If the message mode is TEXT mode(AT+CMGF=1)

unsolicited result code format:
+CMT:<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><text><CR><LF>

**Reference:**

3GPP 27005(Section 3.4.1)

## 7.19. +CBM

**Description:**

+CBM indicates that the cell broadcast message was sent to DTE device after received. Preset by AT+CNMI command,

unsolicited result code format:
+CBM:<mid>,<dcs><cr><lf> <text>

**Parameter:**

<mid>: message id.
<dcs>: data coding format
<text>: determined by the value of <dcs>

**Reference:**

3GPP 27005(Section 3.4.1)

## 7.20. AT+SMSC

**Description:**

This command changes the status of message stored in SIM card.

**Set Command:**

AT+SMSC=<loc>, <status>
Return:
OK/+CMS ERROR: <err>

**Test Command:**

AT+SMSC=?
Return:
+SMSC: (1-max), (* if max is 30 in USIM/SIM, return: +SMSC: (1-30), )
OK

**Parameter:**

<loc>: message sequence in SIM card
<status>: The new status to be changed can only from unread to read, or from unsent to sent.

| PDU MODE | TEXT MODE |
|---|---|
| 0 | REC UNREAD |
| 1 | REC READ |
| 2 | STO UNSENT |
| 3 | STO SENT |

## 7.21. AT+SUSS

**Description:**

This command is used to set REC UNREAD status of these messages which remain unchanged, after AT+CMGR and AT+CMGL commands are performed.

**Set Command:**

AT+SUSS=<mode>
Return:
OK

**Read Command:**

AT+SUSS?
Return:
+SUSS: <mode>
OK

**Test Command:**

AT+SUSS=?
Return: +SUSS: (0-1)
OK

**Parameter:**

| MODE | DESCRIPTION |
|---|---|
| 0 | Status of message remains unchanged |
| 1 | Status of message will be changed (default value) |

## 7.22. AT+CNMA

**Description:**

This command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer to command +CNMI tables).
This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1.
In PDU mode, it is possible to send either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network. Parameter <n> defines which one will be sent.
TEXT mode：

**Execution Command:**

AT+CNMA
PDU mode：

**Execution/Set Command:**

AT+CNMA [=<n>[, <length>[<CR>PDU is given<ctrl-Z/ESC>]]]
Return: OK

**Test Command:**

AT+CNMA=?
Return:
+CNMA: (0-2), (0-178)
OK

**Parameter:**

| <n> | DESCRIPTION |
|---|---|
| 0 | command operates similarly as defined for the text mode |
| 1 | send RP-ACK |
| 2 | send RP-ERROR |

<length>: ACKPDU length（octet）

**Reference:**

3GPP 27005(Section 3.4.4)

## 7.23. AT+CMMS

**Description:**

Set command is used to control 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.

**Set Command:**

AT+CMMS=[<n>]
Return:
OK

**Read Command:**

AT+CMMS?
Return:
+CMMS: <n>
OK

**Test Command:**

AT+CMMS=?
Return:
+CMMS: (0-2)
OK

**Parameter:**

<n>:
0: disable
1: keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0
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)

**Reference:**

3GPP 27005(Section 3.5.6)

## 7.24. AT+CMGC

**Descrption：**

The command is used to send short message

**Set Command：**

AT+CMGC = <da>[, <toda>]<CR>
OK

AT+CMGC = <length><CR>
>
PDU <ctrl - z/ESC>
Return：
+CMGC：<mr>
OK / +CMS ERROR：<err>

**Parameter：**

<length>：8 bytes format TPDU (not include 8 bytes of SMSC address) Note：range：9 – 160
PDU：including <SMS center number><00 means the number using +CSCA set> + <TPDU>, and <SMS center number> follows the provisions of 3GPP TS 24.011, <TPDU> follows the provisions of 3GPP TS 23.040. The hexadecimal TPDU must change to two ASCII characters.range of length is 18 to 502. EXP: 0x2A means to 2(ASCII 50) and A (ASCII 65)

<da>： TP-destination-address(string format), BCD number(or GSM 7bits default characters), change to selected characters of TE character sets currently(reference +CSCS command)

<toda>：destination address type
128：unknown number
129：SDN number(default)
145：international ISDN call number
161：national ISDN call number

# 8. Phonebook Commands

## 8.1. AT+CPBS

**Description:**

Set command selects phonebook memory storage <storage>, which is used by other phonebook commands. If setting fails in an MT error, +CME ERROR: <err> is returned.

Read command returns currently selected memory, and when supported by manufacturer, number of used locations and total number of locations in the memory.

Test command returns supported storages as compound value.

**Set Command:**

AT+CPBS=<storage>
Return:
OK/ERROR

**Read Command:**

AT+CPBS?
Return:
+CPBS: <storage> (default value: “SM”)[,<num used>,< num available>]
OK

NOTE：For some customer, test return format is:
+CPBS: <max_record_num>,<used_record_num>,<first_index>,<max_alpha_len>,<max_number_len>

**Test Command:**

AT+CPBS=?
Return:
+CPBS:(“SM”,”FD”, “AP”, “SN”, “ON”, “NV”,”EN”)
OK

**Parameter :**

<num used>: integer type value indicating the number of used locations in selected memory
<num available>: integer type value indicating the total number of locations in selected memory

| <storage> | Description |
|---|---|
| “SM” | USIM/SIM phonebook |
| “FD” | SIM/USIM fixdialling-phonebook. |
| “AP” | USIM:ADN in DFusim/DFphonebook |
| “SN” | SIM: Service Dialling Number phonebook |
| “ON” | SIM: MSISDN |
| “NV” | NV phonebook |
| “EN” | Emergency Call phonebook(+CPBW is not be applicable for this storage) |

**Reference:**

3GPP 27007 (Section 8.11)

## 8.2. AT+CPBR

**Description:**

Execution command returns phonebook entries in location number range <index1>... <index2> from the current phonebook memory storage selected with +CPBS. If <index2> is left out, only location <index1> is returned. If listing fails in an MT error, +CME ERROR: <err> is returned.

Test command returns location range supported by the current storage as a compound value and the maximum lengths of <number>, <text>, <group>, <secondtext> and <email> fields. In case of (U)SIM storage, the lengths may not be available. If MT is not currently reachable, +CME ERROR: <err> is returned.

**Set Command:**

AT+CPBR=<index1>[,<index2>]
Return:
+CPBR=<index1>,<number>,<type>,<text>[,<adnumber>][,<adtype>][,<secondtext>][,<email>]<CR>, <CF>
……

<index2>,<number>,<type>,<text>[,<adnumber>][,<adtype>][,<secondtext>][,<email>]<CR>, <CF>
OK

**Test Command:**

AT+CPBR=?
Return:
+CPBR: <list supported <index>s>, <nlength>, <tlength>, [<glength>], [<slength>], [<elength>]
OK

**Parameter:**

<index1>, <index2>: integer type values in the range of location numbers of phonebook memory
<number>: the phone number in the format of <type>
<type>: type of address octet in integer format
<text>: the character text field with the max size of <tlength>; character set as specified by command Select TE Character Set +CSCS
<adnumber>: accessory phone number (currently, not supported)
<adtype>: accessory phone number type (currently, not supported)
<secondtext>: the character text field with the max size of <slength> (currently, not supported)
<email>: the character string with the max size of <elength>; character set as specified by command select TE Character Set +CSCS( currently , only supported when command +CPBS="ME" is set )
<nlength>: integer type value indicating the maximum length of field <number>
<tlength>: integer type value indicating the maximum length of field <text>
<glength>: integer type value indicating the maximum length of field <group>.( currently, not supported)
<slength>: integer type value indicating the maximum length of field <secondtext>.( currently, not supported)
<elength>: integer type value indicating the maximum length of field <email>.( currently , only supported when command +CPBS="ME" is set)

**Example:**

AT+CPBR=1
+CPBR: 1,"13918928056", 129, "Steven"
OK

AT+CPBR=1,2
+CPBR: 1, "13918928056", 129,"Steven"
+CPBR: 2, "13980563798", 129,"Mary"
OK

**Reference:**

3GPP 27007 (Section 8.12)

## 8.3. AT+CPBF

**Description:**

This command searches phonebook with a name string.

**Set Command:**

AT+CPBF=<name>
Return:
+CPBF: <index>, <number>, <type>, <name>/ERROR (not found).
OK

**Test Command:**

AT+CPBF=?
Return:
+CPBF: <nlength>, <tlength>
OK

**Parameter:**

<nlength>: max length for phonebook number
<tlength>: max length for name
< name>: string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS

**Example:**

AT+CPBF="Mary"
+CPBF:2, "13980563798", 129, "Mary"
OK

**Reference:**

3GPP 27007 (Section 8.13)

## 8.4. AT+CPBW

**Description:**

This command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS. If only <index> is present, phonebook entry is deleted. If <index> is left out, but <number> is given, entry is written to the first free location in the phonebook (the implementation of this feature is manufacturer specific). If writing fails in an MT error, +CME ERROR: <err> is returned.

**Set Command:**

AT+CPBW=<index> [,<number> [, <type> [,< text >]]]
Return:
OK

**Test Command:**

AT+CPBW=?
Return:
+CPBW (list supported <index>s), <nlength>, <list supported types>, <tlength>
OK

**Parameter:**

<index> index id
<number> phone number, its max length couldn't be larger than<nlength>.
<type> Type of phone number
128：Unknown numbering plan, unknown number
129：ISDN/telephony number plan, unknown number
145：ISDN/telephony number plan, international number
161：ISDN/telephony number plan, national number
< text > : string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS
<nlength>: max length of phone number
<tlength>: max length of name

**Example:**

AT+CPBW=3
OK

AT+CPBW=3,"88086666", 129,"John"
OK

When inputting the UCS2 [<text>], users must enter ASCII strings begin with 80.For example: "804F60597D" (Hello),"
0X8000410042"(AB).

AT+CPBW=3, "88086666", 129, "806797519B"
OK

**Reference:**

3GPP 27007 (Section 8.14)

## 8.5. AT+CPBP

**Description:**

This command searches the phonebook for an item with the same phone number as that defined in the parameter.

**Set Command:**

AT+CPBP= <PhoneNumber>
Return:
+CPBP: <index>, <number>, <type>, <name>
OK

**Test Command:**

AT+CPBP=?
Return:

+CPBP: <MaxRecord>, <MaxNumLength>
OK

**Example:**

AT+CPBP="88086666"
+CPBP: 3, "88086666", 129, "John"
OK

## 8.6. AT+CPBN

**Description:**

This command makes a forward or backward move in the phonebook.

**Set Command:**

AT+CPBN=<mode>
Return:
+CPBN: <index2>, <number>, <type>, <text>, <CR>, <CF>
OK

**Test Command:**

AT+CPBN=?
Return:
+CPBN: (0-5)
OK

**Parameter:**

| <mode> | Description |
|---|---|
| 0 | Display the first item |
| 1 | Display the last item |
| 2 | Display the next item |
| 3 | Display the above item |
| 4 | Display the latest read item |
| 5 | Display the latest written item |

**Example:**

AT+CPBN=?
+CPBN: (0-5)
OK

AT+CPBN=0
+CPBN : 15,.+331290101.,145,.John.
OK

AT+CPBN=2
+CPBN : 5,+33147658987, 145,Steven.
OK

AT+CPBN=2
+CPBN: 6, +331290302., 145, Mary.
OK

AT+CPBN=3
+CPBN: 5, +33147658987, 145, Steven.
OK

AT+CPBN=1
+CPBN: 6, +331290302, 145, Mary.
OK

AT+CPBN=2
+CPBP: 15, +331290101, 145, John.
OK

AT+CPBF=John.
+CPBF: 15, +331290101, 145, John
OK

AT+CPBN=2
+CPBN: 5, +33147658987, 145, Frank.
OK

AT+CPBF=John
+CPBF: 15, +331290101, 145, John
OK

AT+CPBN=4
+CPBF: 15, +331290101, 145, John.
OK

AT+CPBW=1, 0146290800, 129, Windy
OK

AT+CPBN=4
+CPBF: 15, +331290101, 145, John.
OK

AT+CPBF="Frank"
+CPBF : 5, +33147658987, 145,.Frank.
OK

AT+CPBN=4
+CPBF: 15, +3312345, 145, 8000414339FFFF.
OK

AT+CPBN=5
+CPBF: 1, 0146290800, 129, Windy
OK

## 8.7. AT+CNUM

**Description:**

This command returns the subscriber MSISDN.

**Execution Command:**

AT+CNUM
Return:
+CNUM: Phone, <PhoneNumber>, 129
OK

**Test Command:**

AT+CNUM=?
Return:
OK

**Parameter:**

<number*x*>: string type phone number of format specified by <type*x*>
<type*x*>: type of address octet in integer format
<alpha*x*>: optional alphanumeric string associated with <number*x*>; used character set should be the one selected with command Select TE Character Set +CSCS

**Example:**

AT+CNUM
+CNUM: Phone, "13918928056", 129

**Reference:**

3GPP 27007 (Section 7.1)

## 8.8. AT+SDCP

**Description:**

This command is used to delete all the calls listed in "LD", "MC" and "RC" phonebooks.

**Read Command:**

AT+SDCP?
Return:

OK/ERROR

**Test Command:**

AT+SDCP=?
Return:
+SDCP: ("LD","MC","RC")
OK

**Set Command:**

AT+SDCP=<calls phonebook>
Return:
OK/ERROR

**Parameter:**

<calls phonebook>: “LD”,”MC”,”RC”

## 8.9. AT+CSVM

**Description:**

This command is used to set (or get ) and enable(or disable) the voice mail number. If setting fails, an MT error, +CME ERROR: <err> is returned.

Read command returns the currently selected voice mail number and the status (i.e. enabled/disabled).

Test command returns supported <mode>s and <type>s.

**Read Command:**

AT+CSVM?
Return:
+CSVM: <mode>,<number>,<type>
+CME ERROR: <err>

**Test Command:**

AT+CSVM=?
Return:
+CSVM: (0-1), <nlength>, (128,129,145)
OK

**Set Command:**

AT+CSVM=<mode>[,<number>[,<type>]]
Return:
OK/ERROR

**Parameter:**

<nlength>: max length for phone number
<mode>
0: Disable voice mail
1: Enabel voice mail
<number>:
The voice mail number with a range between 0 and the length of phone number ( <nlength> ).
<type>: The type of voice mail number

**Example:**

Read Command: AT+CSVM?
Return:
+CSVM: 0,””, 128
OK

**Reference:**

3GPP 27007 (Section 8.33)

## 8.10. AT+CPBCAPA

**Description：**

The command is used to get the status of 3G phonebook

**Set command：**

AT+CPBCAPA = <pbfieldtype>
Return：
OK/ERROR

**Parameter：**

<pbfieldtype>：the field of phonebook

| **<pbfieldtype>** | **Description** |
|---|---|
| 1 | NAME |
| 2 | NUMBER |
| 3 | ANR1 |
| 4 | EMAIL1 |
| 5 | SNE |
| 6 | GPR |
| 7 | PBC |
| 8 | ANR2 |
| 9 | ANR3 |
| 10 | ANR4 |
| 11 | EMAIL2 (not support |
| 12 | EMAIL3 not support |
| 13 | EMAIL4 not support |

# 9. USAT/STK Commands

Preface
USIM/SIM Application Toolkit is abbreviated to USAT/STK. It can be used by service providers to support a broad range of services, such as GO_TONE and MONTERNET supported by China Communication, etc. USAT/STK allows service providers to supply new services without exchanging mobile phones, because new ones can be realized by developing new applications and download them to the SIM.
STK refers to GSM 11.14, USAT refers to 31.11. It introduces about 25 new commands for the USIM/SIM,CLASS1 offers a subset of commands, while CLASS3 offers the full range of command.

USAT/STK supports:
Profile download,
Proactive USIM/SIM,
Data download into USIM/SIM.
Menu selection,
Call control by USIM/SIM.
SMS control by USIM/SIM

Profile Download command is used to indicate which USAT/STK features the customer application supports. The command used for this operation is AT+STSF.
A proactive USIM/SIM provides a mechanism whereby certain actions can be preformed.

These actions include:
- display menus
- display text
- get user input
- send a short message
- set up a call

The commands used for this operation are:

## 9.1 AT+ESATCAPREQ

**Description:**

This command is used to query STK capability.

**Read Command:**

AT+ESATCAPREQ?
Return:
+ ESATCAPREQ: <n>
OK/+CME ERROR: <err>

**Parameter:**

<n>:
0 The SIM card supports STK
1 The SIM card does not support STK

**Reference:**

OMS RIL AT Interface (Section 7.9)

## 9.2 AT+ESATENVECMD

**Description:**

This command is used to send envelope command to SIM/USIM.

**Set Command:**

AT+ESATENVECMD=<data>
Return:
+ESATENVECMD: <n>
OK/+CME ERROR: <err>

**Parameter:**

<data>:
the data structure of envelope command, please refer to 3GPP 11.14, section 8, 9, 10, 11
<n>:
0: the command is sent successfully

1: the command is not sent successfully

**Reference:**

OMS RIL AT Interface (Section 7.10)

## 9.3 AT+ESATPROFILE

**Description:**

This command is used to get SIM card profile.

**Read Command:**

AT+ESATPROFILE?
Return:
+ESATPROFILE: <data>
OK/+CME ERROR: <err>

**Parameter:**

<data>:
the data structure of SIM card profile

**Reference:**

OMS RIL AT Interface (Section 7.11)

## 9.4 AT+ESATTERMINAL

**Description:**

This command is used to send terminal response to SIM/USIM

**Set Command:**

AT+ESATTERMINAL=<data>
Return:
+ESATTERMINAL: <n>
OK/+CME ERROR: <err>

**Parameter:**

<data>:
the data structure of terminal response, please refer to 3GPP 11.14, section 6.8
<n>:
0: the command is sent successfully
1: the command is not sent successfully

**Reference:**

OMS RIL AT Interface (Section 7.12)

## 9.5 AT+ESATCALLSETUP

**Description:**

This command is used to accept or reject STK call

**Set Command:**

AT+ESATCALLSETUP =<n>
Return:
OK/+CME ERROR: <err>

**Parameter:**

<n>:
0: reject
1: accept

**Reference:**

OMS RIL AT Interface (Section 7.13)

## 9.6 +ESATPROCMDIND

**Description:**

This command is used to indicate when SIM issue a STK proactive command to application

**Unsolicited result code format:**

+ESATPROCMDIND:<string>

**Parameter:**

<string>
It is the binary raw data of the proactive command. The detailed structure is defined in ETSI: 102.223
Notes:
Below STK commands are using this at:
DISPLAY TEXT
GET INKEY
GET INPUT
PLAY TONE
REFRESH
SET UP MENU
SELECT ITEM
SET UP IDLE MODE TEXT
LAUNCH BROWSER

**Reference:**

OMS RIL AT Interface (Section 7.15)

## 9.7 +ESATENDSESSIONIND

**Description:**

This command is used to indicate when STK session is terminated by SIM.

**Unsolicited result code format:**

+ESATENDSESSIONIND

**Reference:**

OMS RIL AT Interface (Section 7.16)

# 10. GPRS Commands

## 10.1. AT+GDCONT

**Description:**

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.
A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.
The settings will not be saved in MS after system reboot.

**Set Command:**

AT+CGDCONT=[<cid>[,<pdp_type>[,<APN>[,<pdp_addr>[,<d_comp>[,<h_comp>]]]]]]
Return:
OK/ ERROR

**Read Command:**

AT+CGDCONT?
Return:
+CGDCONT: <cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp><CR><LF>
[+CGDCONT: <cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp><CR><LF>[...]]
OK

**Test Command:**

AT+CGDCONT=?
Return:
+CGDCONT: (range of supported <cid>s),<pdp_type>,,,(list of supported <d_comp>s and <h_comp>s)
OK

**Parameter:**

<cid>: (PDP Context Identifier) integer (range 1-255), presents PDP context ID.

<pdp_type>: (Packet Data Protocol type), currently, only IP (Internet Protocol) is supported.

<APN>: (Access Point Name) character string, which is used to select GGSN or other data subnets. Please consult local network providers. China Telecom APN who serves Internet is “cmnet”, while the one who serves Wap is “cmwap”.

<pdp_address>: character string, specified PDP address. This string can be blank, because an address will be distributed by network dynamically.

<d_comp>: whether the PDP data should be compressed, 0: No compression, 1: Compression. This bit doesn’t need to be filled, for its default value is 0. Currently, DMT data compression is not supported by any network.

<h_comp>: whether the PDP header should be compressed. 0: No compression, 1: Compression. This bit doesn’t need to be filled, for its default value is 0.
Currently, data compression is not supported by any network.

**Example:**

AT+CGDCONT=1,”IP”,”cmnet”<cr>
OK

AT+CGDCONT=1,”IP”,”cmnet”, 1, 1
+CME ERROR: 4

AT+CGDCONT=4,"IP","cmnet","1.1.1.1", 0, 0
OK

**Reference:**

3GPP 27005 (Section 10.1.1)

## 10.2. AT+CGQREQ

**Description:**

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.
The set command specifies a profile for the context identified by the (local) context identification parameter,

<cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQREQ command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.
A special form of the set command, +CGQREQ= <cid> causes the requested profile for context number

<cid> to become undefined.

NOTE: if 3G (e.g. TD-SCDMA), AT+CGEQREQ is used to configure QOS Parameters, AT+CGEQREQ & AT+CGQREQ command is recommended to used at the same time.

**Set Command:**

AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]
Return:
OK/ ERROR

**Read Command:**

AT+CGQREQ?
Return:
+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>
[+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>[...]]

**Test Command:**

AT+CGQREQ=?
Return:
+CGQREQ: <pdp_type> (list of supported <precedence>s, <delay>s, <reliability>s,<peak>s, and <mean>s)

**Parameter:**

<cid>: (PDP Context Identifier)interger（range1-15）, presents the PDP context ID
<precedence>: presents the priority

| **<precedence>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | High priority |
| 2 | Normal priority |
| 3 | Low priority |

<delay>: presents the classes of delay; 4 - minimal delay, best preformance,1 - worst performance

| **<delay>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1-4 | Delay class |

<reliability>: presents dependability classes； 1 the best dependibility,3,6 the same class,5 the worst one

| **<reliability>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1-6 | Reliability class |

<peak>: presents the throughput classes in peak

| **<peak>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | Up to 1000 (8 kbit/s) |
| 2 | Up to 2000 (16 kbit/s) |
| 3 | Up to 4000 (32 kbit/s) |
| 4 | Up to 8000 (64 kbit/s) |
| 5 | Up to 16000 (128 kbit/s) |
| 6 | Up to 32000 (256 kbit/s) |
| 7 | Up to 64000 (512 kbit/s) |
| 8 | Up to 128000 (1024 kbit/s) |
| 9 | Up to 256000 (2048 kbit/s) |

<mean>: presents average throughout

| **<mean>** | **Description** |
|---|---|

| | |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | 100 (~0.22 bits/s) |
| 2 | 200 (~0.44 bits/s) |
| 3 | 500 (~1.1 bits/s) |
| 4 | 1 000 (~2.2 bits/s) |
| 5 | 2 000 (~4.4 bits/s) |
| 6 | 5 000 (~11.1 bits/s) |
| 7 | 10 000 (~22 bits/s) |
| 8 | 20 000 (~44 bits/s) |
| 9 | 50 000 (~111 bits/s) |
| 10 | 100 000 (~0.22 kbit/s) |
| 11 | 200 000 (~0.44 kbit/s) |
| 12 | 500 000 (~1.11 kbit/s) |
| 13 | 1 000 000 (~2.2 kbit/s) |
| 14 | 2 000 000 (~4.4 kbit/s) |
| 15 | 5 000 000 (~11.1 kbit/s) |
| 16 | 10 000 000 (~22 kbit/s) |
| 17 | 20 000 000 (~44 bits/s) |
| 18 | 50 000 000 (~111 bits/s) |

<pdp_type>: presents PDP type

| **<pdp_type>** | **Description** |
|---|---|
| “IP” | Internet Protocol |
| “PPP” | Point-to-Point Protocol |

**Example:**

AT+CGQREQ=1, 2, 4, 5, 5, 16 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.1.4)

## 10.3. AT+CGQMIN

**Description:**

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.
The set command specifies a profile for the context identified by the (local) context identification parameter,

<cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.
The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

NOTE: if 3G (e.g. TD-SCDMA), AT+CGEQREQ is used to configure QOS Parameters, AT+CGEQMIN & AT+CGQMIN command is recommended to used at the same time.

**Set Command:**

AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]
Return:
OK/ ERROR

**Read Command:**

AT+CGQMIN?
Return:
+CGQMIN:
<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>[+CGQMIN:<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean><CR><LF>[...]]

**Test Command:**

AT+CGQMIN=?

Return:

+CGQMIN: <pdp_type>, (list of supported <precedence>s, <delay>s, <reliability>s, <peak>s, and <mean>s)

**Parameters:**

<cid>: (PDP Context Identifier)interger（range1-15）, specifies the PDP context ID.

<precedence>: presents priority

| **<precedence>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | High priority |
| 2 | Normal priority |
| 3 | Low priority |

<delay>: presents classes of delay

| **<delay>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1-4 | Delay class |

<reliability>: presents classes of dependability, described in AT+CGQREQ.

| **<reliability>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1-6 | Reliability class |

<peak>: presents classes of throughput in peak

| **<peak>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | Up to 1000 (8 kbit/s) |
| 2 | Up to 2000 (16 kbit/s) |
| 3 | Up to 4000 (32 kbit/s) |
| 4 | Up to 8000 (64 kbit/s) |
| 5 | Up to 16000 (128 kbit/s) |
| 6 | Up to 32000 (256 kbit/s) |
| 7 | Up to 64000 (512 kbit/s) |
| 8 | Up to 128000 (1024 kbit/s) |
| 9 | Up to 256000 (2048 kbit/s) |

<mean>: defines average throughput

| **<mean>** | **Description** |
|---|---|
| 0 | Subscribed (from network) value used |
| 1 | 100 (~0.22 bits/s) |
| 2 | 200 (~0.44 bits/s) |
| 3 | 500 (~1.1 bits/s) |
| 4 | 1 000 (~2.2 bits/s) |
| 5 | 2 000 (~4.4 bits/s) |
| 6 | 5 000 (~11.1 bits/s) |
| 7 | 10 000 (~22 bits/s) |
| 8 | 20 000 (~44 bits/s) |
| 9 | 50 000 (~111 bits/s) |
| 10 | 100 000 (~0.22 kbit/s) |
| 11 | 200 000 (~0.44 kbit/s) |
| 12 | 500 000 (~1.11 kbit/s) |
| 13 | 1 000 000 (~2.2 kbit/s) |
| 14 | 2 000 000 (~4.4 kbit/s) |
| 15 | 5 000 000 (~11.1 kbit/s) |
| 16 | 10 000 000 (~22 kbit/s) |
| 17 | 20 000 000 (~44 bits/s) |
| 18 | 50 000 000 (~111 bits/s) |

<pdp_type>: PDP type, described in AT+CGQREQ

| **<pdp_type>** | **Description** |
|---|---|
| “IP” | Internet Protocol |

| | |
|---|---|
| “PPP” | Point-to-Point Protocol |

**Example:**

AT+CGQMIN=1, 2, 4, 5, 5, 16 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.1.5)

## 10.4. AT+CGPCO

**Description:**

This command is used to configure the PDP context Parameters of PCO, when DMT is sending the activation message of PDP context. The settings will not be saved in MS after system reboot.

**Setting Command:**

AT+CGPCO=<type>,<user>,<password>,<cid>, [<auth_type>]
Return:
OK/ERROR

**Read Command:**

AT+CGPCO?
Return:
+CGPCO: <type>, <user>, <password>, <cid> <CR><LF>
[+CGPCO: <type>, <user>, <password>, <cid> <CR><LF>[...]]
OK

**Test Command:**

AT+CGPCO=?
Return:
+CGPCO: 0-1），, , (1-15）
OK

**Parameter:**

<type>

| <type> | Description |
|---|---|
| 0 | User and password are code as ASCII character |
| 1 | User and password are code as PDU character |

<user>: The user name used by pco, which the max length is 64 bytes in ASCII character or max length is 128bytes in PDU character.

<password>: The user password used by pco, which the max length is 64 bytes in ASCII character or max length is 128 bytes in PDU character.

<auth_type>:
0:NONE
1:PAP (Default)
2:CHAP
3:PAP & CHAP
Default： PAP

**Example:**

AT+CGPCO=0,”wap@cmnet.com”,”wap1”,1
OK

AT+CGPCO?
+CGPCO: 0, 2
+CGPCO: 0’ “wap@cmnet.com”, “wap1”, 1
OK

## 10.5. AT+CGATT

**Description:**

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be

achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.
The read command returns the current Packet Domain service state.
The test command is used for requesting information on the supported Packet Domain service states.

**Setting Command:**

AT+CGATT= [<state>]
Return:
OK/ ERROR

**Read Command:**

AT+CGATT?
Return:
+CGATT: <state>

**Test Command:**

AT+CGATT=?
Return:
+CGATT: (list of supported <state>s)

**Parameter:**

<state>

| <state> | Description |
|---|---|
| 0 | Detach GPRS service |
| 1 | Attach GPRS service |

**Example:**

AT+CGATT=1 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.1.9)

## 10.6. AT+CGACT

**Description:**

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.250 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and them attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation form of the command activates all defined contexts.
If no <cid>s are specified the deactivation form of the command deactivates all active contexts.
The read command returns the current activation states for all the defined PDP contexts.
The test command is used for requesting information on the supported PDP context activation states.

**Set Command:**

AT+CGACT= [<state>[,<cid>[,<cid>[,...]]]]
Return:
OK/ ERROR

**Read Command:**

AT+CGACT?
Return:
+CGACT: <cid>, <state><CR><LF> [+CGACT: <cid>, <state><CR><LF> [...]]

**Test Command:**

AT+CGACT=?
Return:
+CGACT: (list of supported <state>s)

**Parameter:**

<state>:

| <state> | Description |
|---|---|
| 0 | Deactivate PDP context |
| 1 | Activate PDP context |

<cid>: (PDP Context Identifier) integer (1~15), specifies the PDP context ID. In default case, AT+CGACT=1 indicates to activate PDP context 1, AT+CGACT=0 indicates to deactivate all of the activated PDP context.

**Example:**

AT+CGACT=1, 1 <cr>
OK
AT+CGACT=0, 1 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.1.10)

## 10.7. AT+CGPADDR

**Description:**

The execution command returns a list of PDP addresses for the specified context identifiers.
The test command returns a list of defined <cid>s.

**Execution Command:**

AT+CGPADDR= [<cid>[,<cid>[,...]]]
Return:
+CGPADDR: <cid>, <pdp_addr> <CR><LF>[+CGPADDR: <cid>,<pdp_addr><CR><LF>[...]]

**Test Command:**

AT+CGPADDR=?
Return:
+CGPADDR: (list of supported <cid>s)

**Parameter:**

<cid>: (PDP Context Identifier)integer(1~15), specifies PDP context id, If no specification, return all PDP context.
<pdp_address>: character string; PDP context address

**Example:**

AT+CGPADDR=1 <cr>
+CGPADDR=1,”104.192.5.4”
OK
AT+CGPADDR=? <cr>
+CGPADDR: (1-15)
OK

**Reference:**

3GPP 27005 (Section 10.1.14)

## 10.8. AT+CGDATA

**Description:**

The execution command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations. If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.

**Execution Command:**

AT+CGDATA=[<L2P>, [<cid> [ ,<cid> [,…]]]]
Return:
CONNECT/ERROR

**Test Command:**

AT+CGDATA=?
Return:

+CGDATA: (list of supported <L2P>s)

**Parameter:**

<L2P>: specifies the Layer2 protocol between DTE and DMT. Currently, only PPP is supported.
<cid>: (PDP Context Identifier),range（1~15）, specifies PDP context id.

**Example:**

AT+CGDATA=“PPP”, 1 <cr>
CONNECT

**Reference:**

3GPP 27005 (Section 10.1.12)

## 10.9. AT+CGCMOD

**Description：**

The command modifies specified or all PDP context
Set command：
AT+CGCMOD = “cid1, cid2...”
Return：
OK/ERROR

**Test command：**

AT+CGCMOD=?
Return：
+CGCMOD：(list of supported <cid>s)

**Parameter：**

<cid>：(PDP contest Identifier), range：(1-15), specify ID of PDP context. And must specify <cid> currently

## 10.10. AT+CGAUTO

**Description:**

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.250 basic commands 'S0', 'A and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.
The test command returns the values of <n> supported by the MT as a compound value.

**Set Command:**

AT+CGAUTO=[<state>]
Return:
OK/ ERROR

**Read Command:**

AT+CGAUTO?
Return:
+CGAUTO: <state>

**Test Command:**

AT+CGAUTO=?
Return:
+CGAUTO: (list of supported <state>s)

**Parameter**

| <state> | Description |
|---|---|
| 0 | Disable GPRS auto response, use AT+CGANS command to response to PDP context activation request manually, which is initiated by network terminal. |
| 1 | Enable GPRS auto response, automatically response to the PDP context activation request automatically. |
| 2 | automatic acceptance of GPRS network requests is controlled by the 'S0' command |
| 3 | automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the 'S0' command |

**Example:**

AT+CGAUTO=0 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.1.15)

## 10.11. AT+CGANS

**Description:**

The execution command requests the MT to respond to a network request for Packet Domain PDP context activation which has been signalled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.
If <response> is 0, the request is rejected and the MT returns OK to the TE.
If <response> is 1, the following procedure is followed by the MT.
Commands following the +CGANS command in the AT command line shall not be processed by the MT.
If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.

The detailed behaviour after the online data state has been entered is dependent on the PDP type. It is described briefly in 3GPP TS 27.060[34] and in more detail in 3GPP TS 29.061[39] and the specifications for the relevant PDPs. PDP context activation procedures shall take place prior to or during the PDP startup.
One or more <cid>s may be specified in order to provide the values needed for the context activation request.
During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message. The MT may also have some or all of the following information -

The MT may have a priori knowledge, for example, it may implement only one PDP type.
The command may have provided an <L2P> parameter value.
The TE may provide one or both of PDP type and PDP address to the MT in the PDP startup.

If any of this information is in conflict, the command will fail.
If one or more <cid> is given then an attempt shall be made to identify an appropriate context definition by matching the PDP type and PDP address in the network request with the PDP type and PDP address in each of the specified context definitions (in the order in which their <cid>s appear in the command) as follows -
The PDP type must match exactly.
The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

The context shall be activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not re required, depending on the application.

If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.
If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.250 command state is re-entered and the MT returns the final result code OK

In the event of an erroneous termination or a failure to startup, the V.250 command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

NOTE: This is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. A +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be ignored.

The test command returns the values of <response> and <L2P> supported by the MT as compound values. This command may be used in both normal and modem compatibility modes.

**Set Command:**

AT+CGANS=[<response>, [<L2P> ,[<cid>]]]
Return:
OK/ ERROR

**Test Command:**

AT+CGANS=?
Return:
+CGANS: (list of supported <response>s), (list of supported <L2P>s)

**Parameter:**

<response>: data, presents how to respond, accept it or reject it.
0: refuse the PDP context requests initiated by network terminals.;
1: accept it and initiate PDP CONTEXT activation
<L2P>: presents layer 2 protocol (refer to +CGDATA command).
<cid>: (PDP Context Identifier),range（1~15）, specifies the PDP context id (refers to +CGDCONT ).

**Example:**

+CRING: GPRS “IP”,”104.156.74.8”
AT+CGANS=1 <cr>
CONNECT

**Reference:**

3GPP 27005 (Section 10.1.16)

## 10.12. AT+CGCLASS

**Description:**

The set command is used to set the MT to operate according to the specified mode of operation, see TS 23.060 [47]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology. If no value has been set by the TE previously, the return value shall be the highest mode of operation that can be supported by the MT.

The test command is used for requesting information on the supported MT mode of operation.

**Set Command:**

AT+CGCLASS=[<class>]
Return:
OK/ ERROR

**Read Command:**

AT+CGCLASS?
Return:
+CGCLASS: <class>

**Test Command:**

AT+CGCLASS=?
Return:
+CGCLASS: (list of supported <class>s)

**Parameter:**

<class>: presents GPRS type
A: class A (ONLY support class A, so test command only list “A”, and set command is not allowed)
B: class B (NOT SUPPORTED)
C: class C in circuit switched only mode (lowest)(NOT SUPPORTED)
If DMT is in GPRS attach status , and set the GPRS type of DMT to CC, DMT will initiate GPRS detach process.

**Example:**

AT+CGCLASS=“A” <cr>
OK

AT+CGCLASS=?
+CGCLASS: (“A”)
OK

**Reference:**

3GPP 27005 (Section 10.1.17)

## 10.13. AT+CGREG

**Description:**

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.
NOTE. If the GPRS MT also supports circuit mode services, the +CREG command and +CREG: result codes apply to the registration status and location information for those services.
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.

**Set Command:**

AT+CGREG=[<n>]
Return:
n=1 +CGREG: <stat>
n=2 +CGREG: <stat> [, <lac>, <ci> [, <AcT>]]

**Read Command:**

AT+CGREG?
Return:
+CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] /+CME ERROR: <err>

**Test Command:**

AT+CGREG=?
Return:
+CGREG: (list of supported <n>s)

**Parameter:**

<n>:
0 Disable the auto echo of network register status.
1 Enable the auto echo of network register status. +CGREG: <stat>
2 Enable the auto echo of network register status and the location message: <stat> [, <lac>, <ci> [, <AcT>]]

<stat>:
0 Not registration and no attempt of ME
1 Registered local network
2 No registration and ME is attempting to do
3 Registration rejected.
4 Network registration unknown
5 registered and roam

<lac>: two bytes, for example "00C3" is equal to 195)
<ci>: two bytes, Cell ID, Hex Format
<AcT>: access technology of the registered network
0: GSM
1: GSM Compact
2: UTRAN
3: GSM w/EGPRS (see NOTE 1)
4: UTRAN w/HSDPA (see NOTE 2)
5: UTRAN w/HSUPA (see NOTE 2)
6: UTRAN w/HSDPA and HSUPA (see NOTE 2)

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

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

**Example:**

AT+CGREG=1 <cr>
+CGREG: <stat>
AT+CGREG=2 <cr>
+CGREG: <stat> [, <lac>, <ci> [, <AcT>]]

**Reference:**

3GPP 27005 (Section 10.1.19)

## 10.14. AT+CGSMS

**Description:**

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.

**Set Command:**

AT+CGSMS=[<service>]
Return:
OK/ ERROR

**Read Command:**

AT+CGSMS?
Return:
+CGSMS: <service>

**Test Command:**

AT+CGSMS=?
Return:
+CGSMS: (list of currently available <service>s)

**Parameter:**

<service>: Parameters, present service type.
0 GPRS
1 circuit switched
2 GPRS preferred (use circuit switched if GPRS not available)
3 circuit switched preferred (use GPRS if circuit switched not available)
Notes: Currently, GPRS SMS is not supported by network.

**Reference:**

3GPP 27005 (Section 10.1.20)

## 10.15. Extension of ATD

**Description:**

This command builds the connections between terminal devices and networks, in order to send data.
While performing this command, if DMT hasn't preformed GPRS attach and PDP CONTEXT ACTIVATION operation, these operations should be performed first; If not, build the connections between terminal device and network directly.

**Execution Command:**

ATD*<GPRS_SC_IP>[***<cid>]#
Return:
CONNECT/ ERROR

**Parameter:**

<GPRS_SC_IP>: data string; GPRS service numbers are required (Its value is 99）.
<cid>: (PDP Context Identifier), integer(range: 1－15, presents PDP context ID. This value can be blank, with a default value of 1.

**Example:**

ATD*99#<cr>
or ATD*99***1#<cr>
CONNECT

## 10.16. AT+CGEQREQ

**Description:**

This command allows the TE to specify a UMTS Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.
The set command specifies a profile for the context identified by the (local) context identification parameter,

<cid>. The specified profile will be stored in the MT and sent to the network only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGEQREQ command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.
A special form of the set command, +CGEQREQ= <cid> causes the requested profile for context number <cid> to become undefined.

**Set Command：**

AT+CGEQREQ=[<cid> [,<Traffic class> [,<Maximum bit rate UL> [,<Maximum bit rate DL> [,<Guaranteed bit rate UL> [,<Guaranteed bit rate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority> ]]]]]]]]]]]]
Return ：
OK/ ERROR

**Read Command：**

AT+CGEQREQ?
Return：
+CGEQREQ: <cid>, <Traffic class> ,<Maximum bit rate UL> ,<Maximum bit rate DL> ,<Guaranteed bit rate UL> ,<Guaranteed bit rate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority><CR><LF>
[+CGEQREQ: <cid>, <Traffic class> ,<Maximum bit rate UL> ,<Maximum bit rate DL> ,<Guaranteed bit rate UL> ,<Guaranteed bit rate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay>, <Traffic handling priority><CR><LF>[...]]

**Test Command：**

AT+CGEQREQ=?
Return：
+CGEQREQ: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bit rate UL>s), (list of supported <Maximum bit rate DL>s), (list of supported <Guaranteed bit rate UL>s), (list of supported <Guaranteed bit rate DL>s), (list of supported <Delivery order>s), (list of supported <Maximum SDU size>s), (list of supported <SDU error ratio>s), (list of supported <Residual bit error ratio>s), (list of supported <Delivery of erroneous SDUs>s), (list of supported <Transfer delay>s), (list of supported <Traffic handling priority>s)

**Parameter：**

<cid>: a numeric parameter which specifies a particular PDP context definition

| < Traffic class > | Description |
|---|---|
| 0 | conversational |
| 1 | streaming |
| 2 | interactive |
| 3 | background |
| 4 | subscribed value |

<Maximum bit rate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP

<Maximum bit rate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP

<Guaranteed bit rate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP

<Guaranteed bit rate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP

| < Delivery order > | Description |
|---|---|
| 0 | no |
| 1 | yes |
| 2 | subscribed value |

<Maximum SDU size>: a numeric parameter (1, 2, 3, […]) that indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested.

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs.

| Delivery of erroneous SDUs | Description |
|---|---|
| 0 | no |
| 1 | yes |
| 2 | no detect |
| 3 | subscribed value |

<Transfer delay>: a numeric parameter (0, 1, 2, […]) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds

<Traffic handling priority>: a numeric parameter (1, 2, 3, […]) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers

**Example：**

AT+CGEQREQ=1,1,64,64,64,64,0,100,"6E7","0E0",0,200,1,1,1 <cr>
OK
Notes: Currently, the last two Parameters is not realized.

**Reference:**

3GPP 27005 (Section 10.16)

## 10.17. AT+CGEQENG

**Description：**

The command is used to configure 3G QoS parameters while MT sends PDP context activation messages; if the PDP context has been activated and QoS parameters is greater than minimal acceptable QoS parameters, set by user, it will execute the procedure of modifying PDP context

**Set command：**

+ CGEQNEG: <cid>, <Traffic class> ,<Maximum bitrate UL> ,<Maximum bitrate DL> ,<Guaranteed bitrate UL> ,<Guaranteed bitrate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority><CR><LF>
[+CGEQREQ: <cid>, <Traffic class> ,<Maximum bitrate UL> ,<Maximum bitrate DL> ,<Guaranteed bitrate UL> ,<Guaranteed bitrate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority><CR><LF>[...]]
Return：
OK/ ERROR

**Test command：**

AT+CGEQNEG = ?
Return：
+CGEQNEG：(pdp_id_list)

**Parameter：**

<cid>：(PDP context identifier) integer(range:1-15),specify ID of PDP context

| < Traffic class > | Description |
|---|---|
| 0 | conversational |
| 1 | streaming |
| 2 | interactive |
| 3 | background |
| 4 | subscribed value |

<Maximum bitrate UL>: Maximum upstream rate(kbit/s)
<Maximum bitrate DL>: Maximum downstream rate (kbit/s)
<Guaranteed bitrate UL>: Guaranteed upstream rate (kbit/s)
<Guaranteed bitrate DL>: Guaranteed downstream rate (kbit/s)

| < Delivery order > | Description |
|---|---|
| 0 | no |
| 1 | yes |

| | |
|---|---|
| 2 | subscribed value |

<Maximum SDU size>:(Bytes)
<SDU error ratio>:utilize mEe mode to express, 5E3 means $5 \cdot 10^{-3}$
<Residual bit error ratio>: utilize mEe mode to express, 5E3 means $5 \cdot 10^{-3}$

| Delivery of erroneous SDUs | Description |
|---|---|
| 0 | no |
| 1 | yes |
| 2 | no detect |
| 3 | subscribed value |

<Transfer delay>: (ms)
<Traffic handling priority>

## 10.18. AT+CGEQMIN

**Description:**

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. The specified profile will be stored in the MT and checked against the negotiated profile only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGEQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGEQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

**Set Command：**

AT+CGEQMIN=[<cid> [,<Traffic class> [,<Maximum bit rate UL> [,<Maximum bit rate DL> [,<Guaranteed bit rate UL> [,<Guaranteed bit rate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority> ]]]]]]]]]]]]

Return：

OK/ ERROR

**Read Command：**

AT+CGEQMIN?

Return：

+CGEQMIN: <cid>, <Traffic class> ,<Maximum bit rate UL> ,<Maximum bit rate DL> ,<Guaranteed bit rate UL> ,<Guaranteed bit rate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority><CR><LF>
[+CGEQMIN: <cid>, <Traffic class> ,<Maximum bit rate UL> ,<Maximum bit rate DL> ,<Guaranteed bit rate UL> ,<Guaranteed bit rate DL> ,<Delivery order> ,<Maximum SDU size> ,<SDU error ratio> ,<Residual bit error ratio> ,<Delivery of erroneous SDUs> ,<Transfer delay> ,<Traffic handling priority><CR><LF>[...]]

**Test Command：**

AT+CGEQMIN=?

Return：

+CGEQMIN: <PDP_type>, (list of supported <Traffic class>s) ,(list of supported <Maximum bit rate UL>s), (list of supported <Maximum bit rate DL>s), (list of supported <Guaranteed bit rate UL>s), (list of supported <Guaranteed bit rate DL>s),(list of supported <Delivery order>s) ,(list of supported <Maximum SDU size>s) ,(list of supported <SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Transfer delay>s) ,(list of supported <Traffic handling priority>s)

**Parameter:**

<cid>: a numeric parameter which specifies a particular PDP context definition

| < Traffic class > | Description |
|---|---|
| 0 | conversational |
| 1 | streaming |

| | |
|---|---|
| 2 | interactive |
| 3 | background |
| 4 | subscribed value |

<Maximum bit rate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP

<Maximum bit rate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP

<Guaranteed bit rate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP

<Guaranteed bit rate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP

| **< Delivery order >** | **Description** |
|---|---|
| 0 | no |
| 1 | yes |
| 2 | subscribed value |

<Maximum SDU size>: a numeric parameter (1, 2, 3,…) that indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested.

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs

| **Delivery of erroneous SDUs** | **Description** |
|---|---|
| 0 | no |
| 1 | yes |
| 2 | no detect |
| 3 | subscribed value |

<Transfer delay>: a numeric parameter (0, 1, 2, […] ) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds

<Traffic handling priority>: a numeric parameter (1, 2, 3, […]) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers

**Example：**

AT+CGEQMIN=1,1,64,64,64,64,0,100,"6E7","0E0",0,200,1,1,1 <cr>
OK

**Reference:**

3GPP 27005 (Section 10.16)

## 10.19. AT+CGEREP

**Description：**

The command could enable or disable that MT sends non-request result code +CGEV：xxx to TE.

**Set command：**

AT+CGEREP = [<MODE> [, <BFR>]]
Return：
OK / ERROR：<err>

**Get command：**

AT+CGEREP?
Return：
+CGEREP：<mode>, <bfr>
OK

**Test command：**

AT+CGEREP=?
Return：
+CGEREP：(<mode> value list), (<bfr>value list)
OK

**Parameter：**

| Parameter | Value | Description |
|---|---|---|
| <mode> | [0] | Buff non-request result code in MT； if the buffer of MT result code is full,it will discard the oldest result code and not to forward to TE |
| | 1 | While saving MT-TE link(exp: online data mode),it will discard non-request result code; otherwise, directly forward to TE |
| | 2 | While saving MT-TE link(onine data mode), it will buff non-request result code in MT； while MT-TE link is available, it will write all result codes to TE； otherwise,directly forward to TE |
| <bfr> | [0] | While parameter of <mode> is 1 or 2, it will delete the MT buffer of non-request result code defined by the command |
| | 1 | While parameter of <mode> is 1 or 2, the MT buffer of non-request result code defined by the command will write to TE.(it must return OK, before writing result code) |

## 10.20. AT+CGTFT

**Description：**

The command is used to set a packet filter specified by TFT

**Set command：**

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

Return：

OK / ERROR：<err>

**Test command：**

AT+ CGTFT =?
Return ：
+ CGTFT："IP",(1-8),(0-255),,(0-255),,,(0-4294967295),,(0-16777215)

**Parameter:**

| Parameter | Value | Description |
|---|---|---|
| <cid> | 1～11 | PDP ID |
| <packet filter identifier> | 1～16 | packet filtering label |
| <evaluation precedence index> | 0～255 | evaluation priority |
| <source address and subnet mask> | | "." is used to split serial code,and the format is different between IPV4 and IPV6.<br>IPv4 ： "a1.a2.a3.a4.m1.m2.m3.m4"<br>IPv6 ： "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" |
| <protocol number (ipv4) / next header (ipv6)> | 0～255 | "."is used to split serial code<br>IPV4：protocol number<br>IPV6：next header |
| <destination port range> | | "."is used to split serial code |

| | | |
|---|---|---|
| <source port range> | | “.”is used to split serial code |
| <ipsec security parameter index (spi)> | 0～4294967295 | |
| <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> | | “.”is used to split serial code,<br>IPV4：type of service &mask<br>IPV6：traffic class & mask |
| <flow label (IPV6)> | 0～1677715 | flow label,IPV6 only |

## 10.21. AT+CGDSCONT

**Desription：**

set secondary pdp context

**Set command：**

AT+ CGDSCONT =[<cid>[,<pid> [,<d_comp>[,<h_comp>]]]]

Return ：

OK/ ERROR

**Test command:**

AT+ CGDSCONT=?

Return ：

+ CGDSCONT: 1-15),(1-15),\"IP\",,,(0,1),(0,1)

**Parameter：**

<cid>: PDP Context Identifier (integer) （range:1－15）

< p_cid >: PDP Context Identifier defined by CGDCONT

<d_comp>: decide PDP data whether need to compress.

0：don’t need to compress；(default)

1：need to compress.

Network don’t support data compression currently .(default value (0))

<h_comp>: decide PDP header data whether need to compress.

0：don’t need to compress (default)

1：need to compress.

Network don’t support data compression currently .(default value (0))

# 11. A-GPS Related Commands

## 11.1. AT+CAGPS

**Description：**

Enable or disable A-GPS command

**Set command：**

AT+CAGPS=<enable>
Return：
OK/ERROR

**Read command：**

AT+CAGPS?
Return :
+CAGPS：<enable>

**Parameter:**

| Parameter | Description | Value |
|---|---|---|
| enable | Whether open the function of A-GPS or not.if open, MT will send +AGPSM result code while PLMN need measuring report | 0：disable A-GPS function<br>1：enable A-GPS function. after opening A-GPS function,MODEM will send +AGPSM: result code while receiving measuring command of network. |
| ep_type | ellipsoid point | 0 ellipsoid point<br>1 ellipsoid point with uncertainty circle<br>2 ellipsoid point with uncertainty ellipse<br>3 ellipsoid point with altitude<br>4 ellipsoid point with altitude and uncertainty ellipse |

+AGPSM：the format of result code as follows:
+AGPSM：<enable>[, <ep_type>]
<enable> indicates whether network requests to begin or modify A-GPS measuring report or not
1 begin or modify 0 disable
<ep_type> indicates whether need to report the type of ellipsoid point or not ,while beginning or modifying A-GPS measuring report.

## 11.2. AT+AGPSMR

**Description：**

TE sends A-GPS measuring report to MT, and MT sends measuring report to network.

**Set command：**

AT+AGPSMR=<result>,<ep_type>,<calc_3d_position >,<lat_sign>,<gps_tow_msec>,<latitude >,<longtitude >,…
While <ep_type> is 0：
AT+AGPSMR=<result>,0,<calc_3d_position>,<lat_sign>,<gps_tow_msec>,<latitude>,<longitude><CR>
> MParamList<ctrl-z/ESC>

While <ep_type> is 1：
AT+AGPSMR=<result>,1,<calc_3d_position>,<lat_sign>,<gps_tow_msec>,<latitude>,<longitude>,<uncert_code><CR>
> MParamList <ctrl-z/ESC>

While <ep_type> is 2：
AT+AGPSMR=<result>,2,<calc_3d_position>,<lat_sign>,<gps_tow_msec>,<latitude>,<longitude>,<confidence>,<uncert_smi>,<uncert_sma>,<orientatio>**<CR>**
> MParamList <ctrl-z/ESC>

While <ep_type> is 3:
AT+AGPSMR=<result>,3,<calc_3d_position>,<lat_sign>,<gps_tow_msec>,<latitude>,<longitude>,<alt_dir>,<alt><CR>
> MParamList <ctrl-z/ESC>

While <ep_type> is 4:
AT+AGPSMR=<result>,4,<calc_3d_position>,<lat_sign>,<gps_tow_msec>,<latitude>,<longitude>,<uncert_smi>,<uncert_sma>,<orientatio>,<alt_dir>,<alt>,<uncert_alt><CR>
> MParamList <ctrl-z/ESC>
Return: OK/ERROR

**Parameter:**

| Parameter | Description | Value |
|---|---|---|
| result | Whether measurment value is valid or not | 0 invalid<br>1 valid |
| ep_type | ellipsoid point type | 0 ellipsoid point<br>1 ellipsoid point with uncertainty circle<br>2 ellipsoid point with uncertainty ellipse<br>3 ellipsoid point with altitude<br>4 ellipsoid point with altitude and uncertainty ellipse |
| calc_3d_position | Calculate 3D position | 0 not calculate 3D position<br>1 calculate 3D position |
| lat_sign | Longitude and latitude type | 0 north latitude<br>1 south latitude |
| gps_tow_msec | GPS time, indicate millisecond of moment in a week | $0 \sim 6.048 \times 10^8 - 1$ |
| latitude | Latitude measure(marked as N), relation with latitude is(marked as X, unit:degree):<br>$N \le 2^{23} X / 90 < N + 1$ | $0 \sim 2^{23} - 1$ |
| longitude | Longitude measure(marked as N), relation with longitude(marked as X, unit:degree) is:<br>$N \le 2^{24} X / 360 + 2^{23} < N$ | $0 \sim 2^{24} - 1$ |
| uncert_code | Uncertain code | 0~127 |
| confidence | Confidence percent | 0~100 |
| uncert_smi | uncertainty semi-minor | 0~127 |
| uncert_sma | uncertainty semi-major | 0~127 |
| orientation | main axle orientation | 0~89 |

| | | |
|---|---|---|
| alt_dir | altitude | 0 positive altitude<br>1 negative altitude |
| alt | Altitude measure,marked as N,(unit: meter),relation with Altitude is : $N \le a < N+1$ | $0 \sim 2^{15}-1$ |
| uncert_alt | uncertainly altitude | |
| MParamList | GPS measurement parameter list | (APP_MN_AGPS_MeasurementParamList_t) |

```
typedef struct
{
 uint8 satelliteID;
 uint8 c_N0;
 uint32 doppler;
 uint16 wholeGPS_Chips;
 uint16 fractionalGPS_Chips;
 uint32 multipathIndicator;
 uint8 pseudorangeRMS_Error;
} APP_MN_AGPS_MeasurementParam_t;
typedef struct
{
 uint8 NumGpsMeasurementParam;
 APP_MN_AGPS_MeasurementParam_t GpsMeasurementParam[16];//maxSat = 16
} APP_MN_AGPS_MeasurementParamList_t;
```

## 11.3. AT+ AGPSMER

**Description:**

TE sends measurement error report of A-GPS to MT, MT sends measurement report to network

**Set command：**

AT+AGPSMER=<error_cause>,<almanacRequest>,<utcModelRequest>,<ionosphericModelRequest>,<navigationModelRequest>,<dgpsCorrectionsRequest>,<referenceLocationRequest>,<referenceTimeRequest>,<aquisitionAssistanceRequest>,<realTimeIntegrityRequest>,<addition_data_flag>,<gps_week>,<gps_toe>,<tToeLimit>,<sat_data_info_num> [,<satID>,<iode>[,<satID>,<iode>[,…]]]

Return：

OK/ERROR

**Parameter：**

| Parameter | Description | Value |
|---|---|---|
| error_cause | Error cause | 0 not enough OTDOA cells<br>1 not enough GPS satellites<br>2 assistance data missing<br>3 not accomplished GPS timing of cell frames<br>4 undefined error<br>5 request denied by user<br>6 not processed and timeout<br>7 reference cell not serving cell |

| | | |
|---|---|---|
| almanacRequest | Almanac | 0 not request<br>1 request |
| utcModelRequest | UTC model | 0 not request<br>1 request |
| ionosphericModelRequest | Ionospheric model | 0 not request<br>1 request |
| navigationModelRequest | Navigation model | 0 not request<br>1 request |
| dgpsCorrectionsRequest | DGPS corrections | 0 not request<br>1 request |
| referenceLocationRequest | Reference Location | 0 not request<br>1 request |
| referenceTimeRequest | Reference Time | 0 not request<br>1 request |
| aquisitionAssistanceRequest | Acquisition Assistance | 0 not request<br>1 request |
| realTimeIntegrityRequest | Real-Time Integrity | 0 not request<br>1 request |
| addition_data_flag | GPS addition data flag | |
| gps_week | GPS Week | 0~102 |
| gps_toe | GPS_Toe | 0~167 |
| tToeLimit | T-Toe limit | 0~10 |
| sat_data_info_num | Satellites data info number | 0~63 |
| satID | 卫星 ID | 0~63 |
| iode | IODE | 0~255 |

## 11.4. AT+Q3GNCELL

**Description：**

This command is usedby AGPS to enquire 3G NCELL.

**Set command：**

AT+ Q3GNCELL
+ Q3GNCELL: “scellIdentifier[0], scellIdentifier[1] scellIdentifier[2] scellIdentifier[3], scell_rxlev, cell_num,” ncell_ lac,ncell_cell_id”,ncell_rxlev,

Note: report six ncells informations at most
return：
OK

**Test command:**

AT+ Q3GNCELL=?
Return：
OK

## 11.5. AT+Q2GNCELL

**Description：**

This command is usedby AGPS to enquire 3G NCELL.

**Set command:**

AT+ Q2GNCELL
+ Q2GNCELL: “scell_lac,scell_cell_id”,scell_rxlev,cell_num,”ncell_lac,ncell_cell_id”,ncell_rxlev,

Note: report six ncell informations at most
Return：
OK

**Test command：**

AT+ Q2GNCELL=?
Return：
OK

# 12. Special Commands

## 12.1 AT+SIND

**Description:**

This command sets some status of a system which sends indication automatically.

- Indication status of the SIM card
- Indication status of the call
- Indication status of the AT command

**Set Command:**

AT+SIND=<IndLevel >
Return:
OK/ERROR

**Test Command:**

AT+SIND=?
Return:
+SIND: (0-1023)
OK

**Read Command:**

AT+SIND?
Return:
+SIND: < IndLevel > (default value: 1023)

<IndLevel>
1 (bit-0): SIM card Insert/Remove indications
2 (bit-1): Calling party alert indication
4 (bit-2): Indication that product is ready (except for phonebooks, AOC, SMS), but still in emergency mode
8 (bit-3): Indication that the product is ready to process all AT commands.
16 (bit-4): Indication that a new call identifier has been created.
32 (bit-5): Indication that a call has been released
64 (bit-6): Network service available indication
128 (bit-7): Network lost indication
256 (bit-8): Audio On indication
512 (bit-9): SIM phonebook status indication

If <IndLevel>=0, no indication +SIND: <IndNb> will be sent. Above value is available. The value range is 0 ≤ IndLevel ≤ 1023. Value set by AT+SIND command will be stored in Flash automatically.
Indication Format: +SIND : <event> [, <idx> ]

<idx>: Call Id
If the indication is about SIM card phonebook:
+SIND: <event>, <phonebook>,<status>,.,<phonebook>,<status>

<phonebook> : (.SM., .FD, .LC., .MC.)

<status> :
0: No reload from SIM
1: Reloaded from SIM
The supported events are:

<event>
0: SIM card removed
1: SIM card inserted
2: Ring Melody
3: AT module is partially ready
4: AT module is totally ready
5: ID of released calls
6: Released call whose ID=<idx>
7: The network service is available for an emergency call
8: The network is lost
9: Audio ON
10: Show the status of each phonebook after initialization

11: Registered to network

## 12.2 AT+SSAM

**Description:**

This command sets audio device mode.

**Set Command:**

AT+SSAM=< mode >
Return:
OK/ERROR

**Test Command:**

AT+SSAM=?
Return:
+SSAM: (0-2)
OK

**Read Command:**

AT+SSAM?
Return:
+SSAM: < mode >
< mode >
1: Handhold Mode
2: Ear-Free Mode
3: Headset Mode

# 13. CMCC Define Command

## 13.1 ^MODE

**Description:**

when system mode is changed, MS response this indication to TE.

**Unsolicited report :**

^MODE : <sys_mode>,<sys_submode>

**Parameter:**

<sys_mode>: system mode, value as follows:

0: No service

1: Reserved

2: Reserved

3: GSM/GPRS mode

4: Reserved

5: WCDMA mode

15: TD-SCDMA mode

<sys_submode>: sub-system mode, value as follows:

0: No service

1: GSM mode

2: GPRS mode

3: EDGE mode

4: WCDMA mode

5: HSDPA mode

6: HSUPA mode

7: HSDPA mode and HSUPA mode

8: TD_SCDMA mode

## 13.2 AT^SYSINFO

**Description：**

Query current system information, e.g. system service status, domain, and roam status.

**Execution Command:**

AT^SYSINFO

^SYSINFO: < srv_status >,< srv_domain >,< roam_status >,< sys_mode >,< sim_state > ,<reserve>, <sys_submode>

OK

**Parameter:**

| srv_status | Description |
|---|---|
| 0 | No service |
| 1 | Limited service |
| 2 | Normal service |
| 3 | Limited area service |
| 4 | Sleep mode |

| srv_domain | Description |
|---|---|
| 0 | No service |
| 1 | Only cs service |
| 2 | Only ps service |
| 3 | PS+CS service |

| roam_status | Description |
|---|---|
| 0 | Not roaming status |
| 1 | Roaming status |

| sys_mode | Description |
|---|---|
| 0 | No Service |
| 1 | Reserved |
| 2 | Reserved |
| 3 | GSM/GPRS mode |
| 4 | Reserved |
| 5 | WCDMA mode |
| 15 | TD-SCDMA mode |

| sim_state | Description |
|---|---|
| 0 | USIM state invalid |
| 1 | USIM state valid |
| 255 | No USIM Card or need pin verification |

| sys_submode | Description |
|---|---|
| 0 | No service |
| 1 | GSM |
| 2 | GPRS |
| 3 | Edeg |
| 4 | WCDMA |
| 5 | HSDPA |
| 6 | HSUPA |
| 7 | HSDAP and HSUPA |
| 8 | TD |

**Example：**

AT^SYSINFO<cr>
^SYSINFO: 2, 3, 1, 15, 1, 0, 7
OK

## 13.3 AT^HVER

**Description：**

Get ME hardware version

**Example:**

AT^HVER
^HVER: < hardware version >
OK

## 13.4 AT^SYSCONFIG

**Description：**

Set system mode, GW access order, roaming support, and domain.

**Set Command:**

AT^SYSCONFIG=<mode>, <acqorder>,<roam>,<srvdomain>
OK

**Read Command:**

AT^SYSCONFIG?
^SYSCONFIG: <mode>, <acqorder>, <roam>, <srvdomain>

**Parameter:**

| mode | Description |
|---|---|
| 2 | Auto Selection |
| 13 | GSM ONLY |
| 14 | WCDMA ONLY |
| 15 | TDSCDMA ONLY |
| 16 | No Change |

| acqorder | Description |
|---|---|
| 0 | Auto |
| 1 | GSM perferred to UTRAN |
| 2 | UTRAN perferred to GSM |
| 3 | No change |

| roam | Description |
|---|---|
| 0 | Not support |
| 1 | Support |
| 2 | No change |

| srvdomain | Description |
|---|---|
| 0 | CS_ONLY |
| 1 | PS_ONLY |
| 2 | CS_PS |
| 3 | ANY |
| 4 | No change |

## 13.5 AT^CARDMODE

**Description:**

Query current sim card type.
Execution: AT^CARDMODE
^CARDMODE: <sim_type>
OK
+CME ERROR: <err>

| sim_type | Description |
|---|---|
| 0 | Unknown |
| 1 | SIM card |
| 2 | USIM card |

## 13.6 AT^SCPBR

**Description:**

This command returns entries for a range of locations specified by inputted Parameters. If the second parameter is default, only return the entries specified by the first parameter.

**Set Command：**

AT^SCPBR=<index1>[,<index2>]
Return：
^SCPBR=<index1>, <num1>, <type>, <num2>, <type>, <num3>, <type>, <num4>, <type>, <text>, <coding>[,<email>],<CR>,<CF>
…
<index2>,<num1>,<type>,<num2>,<type>,<num3>,<type>,<num4>,<type>,<text>,<coding>[,<email>],<CR>,<CF>

**Test Command：**

AT^SCPBR=?
Return：
^SCPBR: (list of supported <index>s), [<nlength>], [<tlength>], [<mlenth>]
OK

**Parameter**:

<nlength>: max length for phone number
<tlength>: max length of name
<mlength>: max length of email
Note: now not support vcard. According to realization of the command (CPBR), Parameters <num2>, <type>, <num3>, <type>, <num4>, <type><coding>,<email>  not NULL

**Example：**

AT^SCPBR=1

^SCPBR: 1, “13918928056”, 129,,,,,,, “Steven”,,,
OK
AT^SCPBR=1,2
^SCPBR: 1, “13918928056”, 129,,,,,,, “Steven”,,,
^SCPBR: 2, “13980563798”, 129,,,,,,, “Mary”,,,
OK

## 13.7 AT^SCPBW

**Description:**

This command writes the current phonebook in specified location<index>. If parameter <number> and <text> are default, erase item of <index> location.

**Set Command：**

AT^SCPBW=<index>[,<num1>[,<type>[,<num2>[,<type>[,<num3>[,<type>[,<num4>[,<type>[,<text>,<codin g>[,email]
return：
OK

**Test Command：**

AT^SCPBW=?
Rreturn：^SCPBW: (list of supported <index>s), [<nlength>],
(list of supported <type>s), [<tlength>], [<mlength>]
<index>  index id
<number>  phone number, its max length couldn’t be larger than<nlength>.
<type>  Type of phone number
<name>  name, its max length couldn’t be larger than<tlength>
<nlength>: max length of phone number
<tlength>: max length of name
<mlength>：max length of email
Note ： now not support vcard, according to the realization of the command (CPBW), Parameters <num2>,<type>,<num3>,<type>,<num4>,<type><coding>,<email>  not used

**Example：**

AT^SCPBW=3
OK
AT^SCPBW=3,”88086666”, 129, ,,,,,,”John”
OK

When inputting the UCS2[<text>], users must enter ASCII stings begin with 80.For example: “804F60597D” (Hello),”
0X8000410042”(AB).

AT+CPBW=3,”88086666”, 129,”806797519B”
OK

## 13.8 AT^SPN

**Description:**

This command read brand information in SIM/USIM (operator brand or user brand)

**Set Command:**

AT^SPN=<spn_type>
Return:
^SPN: <disp_rplmn>, <coding>, <spn_name>
OK

<spn_type>:
0: GSM_SPN
1: USIM_SPN

<disp_rplmn>:
0: not display RPLMN
1: display RPLMN
99: the field is invalidated, and <spn_name> field is not necessarily read

<coding>: indicate encoding code format and language for field <spn_name>

0: GSM 7 bit Default Alphabet
1: USC2 (default value in SIM)
<spn_name>: character string, if encoded with GSM7bit, the max length of string is 16 bytes. If encoded with USC2, the string is hexadecimal text type and the max size is 32 bytes.

## 13.9 AT AT^MBAU

**Description:**

This command is used to authenticate USIM/SIM.

**Set Command:**

AT^MBAU=<RAND>,<AUTN/Ks_input>
Return:
^MBAU: <status>[,<RES/AUTS>]
OK

**Test Command:**

AT^MBAU=?
Return：
^MBAU :(),()
OK

**Parameter:**

<RAND>：RAND value.
<AUTN/Ks_input>： AUTN for USIM, Ks_input for SIM.
<status>：
0：authentication success.
1：Synchronization failure
2：Invalid MAC.
3：unsupported security context.
255：other failure value.

<RES/AUTS>：
RES：return RES when status's value is 0
AUTS：return AUTS when status's value is 1

## 13.10 AT+CRSM

**Description:**

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM <command> and its required parameters. MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters. Refer to subclause 9.2 for <err> values.

Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

**Set Command:**

AT+CRSM=<command>[,<field>[,<P1>,<P2>,<P3>[,<data>]]]
Return:
+CRSM: <sw1>,<sw2>[,<response>]

**Test Command:**

AT+CRSM=?
Return:
+CRSM: (176,178, 192,214,220,242),(0-65535),(0-255),(0-255),(0-255),
OK

**Parameter:**

<command>:
176: READ BINARY

178: READ RECORD
192: GET RESPONSE
214: UPDATE BINARY
220: UPDATE RECORD
242: STATUS

<field >: integer type; this is the identifier of a elementary data file on USIM/SIM. Mandatory for every command except STATUS

<P1>, <P2>, <P3>: integer type; Parameters passed on by the DMT to the USIM/SIM. P1、P2 Parameters are mandatory for every command, except GET RESPONSE and STATUS. Notes: see detail ts102221

<data >: information which shall be written to the USIM/SIM (hexadecimal character format;)
<sw1>, <sw2>: integer type; information from the USIM/SIM about the execution of the actual command. These Parameters are delivered to the TE in both cases, on successful or failed execution of the command

<response>:response of a successful completion of the command previously issued (hexadecimal character format;) <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command

**Reference:**

3GPP 27005 (Section 8.18)

# 14. OMS RIL Commands

## 14.1 +ECEER

**Description:**

Extended error result code notification.

**Unsolicited report:**

+ECEER: <result code>

**Parameter:**

<result code>

Refer to the below table.

| | | |
|---|---|---|
| | 0 | Unknown cause |
| | 1. | Unassigned (unallocated) number |
| | 3. | No route to destination |
| | 6. | Channel unacceptable |
| | 8. | Operator determined barring |
| | 16. | Normal call clearing |
| | 17. | User busy |
| | 18. | No user responding |
| | 19. | User alerting, no answer |
| | 21. | Call rejected |
| | 22. | Number changed |
| | 25. | Pre-emption |
| | 26. | Non selected user clearing |
| | 27. | Destination out of order |
| | 28. | Invalid number format (incomplete number) |
| | 29. | Facility rejected |
| | 30. | Response to STATUS ENQUIRY |
| | 31. | Normal, unspecified |
| | 34. | No circuit/channel available |
| | 38. | Network out of order |
| | 41. | Temporary failure |
| | 42. | Switching equipment congestion |
| | 43. | Access information discarded |
| | 44. | requested circuit/channel not available |
| | 47. | Resources unavailable, unspecified |
| | 49. | Quality of service unavailable |
| | 50. | Requested facility not subscribed |
| | 55. | Incoming calls barred within the CUG |
| | 57. | Bearer capability not authorized |
| | 58. | Bearer capability not presently available |
| | 63. | Service or option not available, unspecified |
| | 65. | Bearer service not implemented |
| | 68. | ACM equal to or greater than ACM max |
| | 69. | Requested facility not implemented |
| | 70. | Only restricted digital information bearer capability is available |
| | 79. | Service or option not implemented, unspecified |
| | 81. | Invalid transaction identifier value |
| | 87. | User not member of CUG |
| | 88. | Incompatible destination |
| | 91. | Invalid transit network selection |
| | 95. | Semantically incorrect message |
| | 96. | Invalid mandatory information |
| | 97. | Message type non-existent or not implemented |
| | 98. | Message type not compatible with protocol state |
| | 99. | Information element non-existent or not implemented |
| | 100. | Conditional IE error |
| | 101. | Message not compatible with protocol state |
| | 102. | Recovery on timer expiry |
| | 111. | Protocol error, unspecified |
| | 127. | Interworking, unspecified |

## 14.2 +ECIND

**Description:**

When ME status update, the +EIND response will be returned from MT to TE, The status type mainly includes:
Call status update (0~5)
SMS service related:
SIM service related:

**Unsolicited report:**

+ECIND: <type>,[<value1>,[value2,[value3,[value4]]]]

**Parameter:**

<type>
0: Call
<value1>
0: active
1: held
2: dialing (MO call)
3: alerting (MO call)
4: incoming (MT call)
5: waiting (MT call)

2: SMS service related
<value1>
0: Indicate that the SMS storage in SIM is not full
1: Indicate that the SMS storage in SIM is full

3: SIM service related
<value1>:
0: SIM_SATUS_READY SIM is initialized or validated and it can be accessed

1: NOT_READY SIM is not inserted or has not been successfully initialized/validated; <p2> could be the reason of init Error, removed.

2: INSERTED SIM is inserted and is being initialized or validated; <p2> could be the reason of wait init, pin1 Required, unblock Pin1 Required or others.

3: SIM STATUS
<value2>
0: sim is ready
1: no sim card detected
2:sim is not ready, and pin or puk is required

<value3> pin status
0: PIN1 is ready
1: PIN1 is required
2: PIN2 is required
3: PUK1 is required
4: PUK2 is required
22:PUK1 is blocked
23:PUK2 is blocked
25:Unknown(because of unknown sim card type or invalid SIM cards)

<value4> card type
0: SIM
1: USIM
255: unknown, when sim not present

4 :sim lock status indication
<value2>
0: sim lock data integrity error
1: network lock
2: network subset lock error
3: sim sp lock error
4: sim corporate lock error
5: sim user lock error

5: indicate the sms ready

6 :sim type indication
<value2>
0: SIM
1: USIM
255: unknown, when sim not present

100: sim plug in indication(if SIM hot swap supported)

## 14.3 AT^DSCI

**Description:**

This command is used to indicate whether or not to report the following information When ME status update, the +EIND response will be returned. The information is about ^DSCI:
<id>,<idr>,<stat>,<type>,<mpty>,<number>,<num_type>,[<bs_type>][,cause]

**Set Command:**

^DSCI=<n>
Return :
OK

**Read Command:**

^DSCI?
Return:
^DSCI: <n>
OK

**Parameter:**

<id>:
Integer:1－7, caller identifier(be used in the command +CHILD )

<dir>: call direction
0: user initiated
1: user hung up

<stat>: call status
0: Active
1: Hang up
2: Dialing（MO）
3: Alerting（MO）
4: incoming call（MT）
5: Waiting
6: Stop

<type>: call type
0: voice
1: data

<mpty>: indicate the call is in multiparty conversation
0: not in multiparty conversation
1: in multiparty conversation

<number>: calling address , the format is specified by <type>
<num_type>: address type (refer to TS 24.008)
<bs_type>: when <type > is not voice service, the field is validate and indicates detail data service.

## 14.4 AT+EVTS

**Description:**

START/STOP DTMF tone

**Set Command:**

AT+EVTS=<mode>[,<dtmf>]
Return:
+CME ERROR: <err>/OK

**Parameter：**

<mode>:
0: stop
1: start

<dtmf>:
A single ASCII character in the set 0 9, #,*,A - D.

**Examples:**

AT+EVTS=1,2
OK

AT+EVTS=0,2
OK

## 14.5 AT+CMER

**Description:**

This 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.

**Set Command:**

AT+CMER=<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>]]]]
Return
OK / +CME ERROR: <err>

**Parameter:**

<mode>
1 – enable
Note: currently only 1 supported.

## 14.6 AT* PSNTRG

**Description:**

This command is used to indicate the operator code and the status of network.

**Set Command:**

AT *PSNTRG=<mode>
Return:
*PSNTRG: <Registration state>, <GPRSstate>, <MCC>, <MNC>, <LAC>, <CI>,<PLMN Name>, [<Band indication>], [<Rat>],[<EGPRS state>]
OK

**Parameter:**

<Registration state>
0: Not registered
1: Registered, home PLMN
2: Not registered but searching (registration ongoing)
3: Registration denied
4: Unknown
5: Registered, roaming
6: Limited service (emergency)

<GPRS state>
0: No GPRS available on cell
1: GPRS available on cell and MS attached
2: GPRS available on cell but MS not attached
3: GPRS suspended

<mcc>
String type Mobile country code in numeric format (e.g."208")
<mnc>
String type Mobile network code in numeric format (e.g. "10")
<lac>
String type Two byte location area code in hexadecimal format (e.g"3FA2")
<ci>
String type Two byte cell ID in hexadecimal format (e.g. "6CA5")
<PLMN name>
String type Current PLMN Name in long alphanumeric format
<Band indication>
0: GSM 900
1: E-GSM 900
2: DCS 1800
3: DCS 1900
4: UMTS band
<Rat> Description
0: GSM
1: UMTS
<EGPRS state> Description

0: EGPRS service not available on cell
1: EGPRS service available on cell but MS not GPRS attached
2 EGPRS service available on cell

<mode> : currently , only support query, not support report .
1: start
0: no reaction,only return OK

Note: GPRS state, band, EGPRS state are not supported currently

## 14.7 AT*USBCT

**Description:**

This command is used to set the status of USB.

**Set Command:**

AT*USBCT = <status>
Return:
+CME ERROR: <err>
OK

**Parameter:**

<status>: USB connection status
0: connect with PC
1: connect with AP

**Example:**

AT*USBCT = 1
OK

# Appendix

## Multiplexing Protocol

**Introduction**

The Spreadtrum multiplexing protocol operates between a DCE (Data Communication Equipment: the product) and a DTE (Data Terminal Equipment). It allows a double session over a serial interface: one for AT commands and one for DATA communications.
When AT+SMUX=1, activate the Multiplexing mode. AT commands and DATA communications are encapsulated into packets conforming to the protocol. The header of these packets allows to recognize whether it is a DATA packet or an AT command packet. AT+SMUX=0 deactivates multiplexing protocol. This appendix presents how the multiplexing mode deals with AT commands and data flow. It also describes the format of DATA and AT command packets.

**AT commands packets**

An AT Command is encapsulated into a packet with a header which allows to separate it from DATA packets. This command is formed by a header（3 BYTES）, the AT command itself and a CHECKSUM（1BYTE）:

| B7 B6 B5 B4 B3 B2 B1 B0 |
|---|
| Start pattern 0xAA |
| AT command length LSB |
| AT command pattern 0x1D \|AT command length MSB |
| AT command |
| Checksum |

The first byte（0xAA）is used to identify the packet.
The second byte represents the 8 LSB ( Low Significant Bits)bits of the length of the AT commands.
The third byte consists of two parts: the 3 LSB bits are the 3 MSB ( Most Significant Bit of the length of AT command; the 5 MSB （0xE8）are used to identify an AT command (the maximum possible length of AT command is 2047 bytes. Currently, the system supports the max length of AT command is 1100 bytes).
CHECKSUM is the addition of all the bytes.

**DATA packets**

Header and data together can identify AT commands. The packet is composed of header（3 BYTES）, data and CHECKSUM（1BYTE）:

| B7 B6 B5 B4 B3 B2 B1 B0 |
|---|
| Start pattern 0Xdd |
| Data packet length LSB |
| Data packet type \| Data packet length MSB |
| Data Bytes |
| Checksum |

The first byte（0xDD）is used to identify the packet
The second byte represents the 8 LSB bits of the length of the data field.
The third byte consists of two parts: the 3 LSB represents the 3 MSB bits of the length of data field; the 5 MSB represents the packet type (the maximum possible length of data package is 2047 bytes. Currently, the system supports the max length of data package is 1600 bytes).
The value of data is according to the type of packet:
0 –data packet contains the data to be transmitted.
1-status packet: includes SA,SB,X bits（1）and breaks condition code as follows:

| SA | SB | X | BRK | RI | Spare | Spare | Spare |
|---|---|---|---|---|---|---|---|

2- READY packet: the packet indicates that the target is ready to receive data
3- BUSY packet: the packet indicates that the target is busy and can not receive data.
Currently, other values are not used.
CHECKSUM is the addition of all the transmitted bytes.