



Progress - NAVIA PN6280 AT Command User Guide V1.0

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1. Introduction

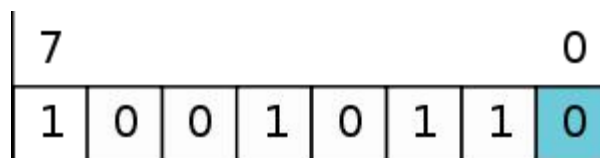
1.1 Overview

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

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

1.2 Bit numbering

To reduce confusing, we use "LSB 0" bit numbering for our Bit reference.



1.3 Template

For new added AT command please follow the format and template in Section 1.4. The Description/Format/Field/Note sub-sections are mandatory.

1.4 AT+[NAME] – [Brief description of the command]

1.4.1 Description

//descript the usage and functionality of this AT command

This command is used to ...

1.4.2 Format

//explain the command format for Test mode/Active mode/Execute mode if any

Command	Possible response(s)
+ [NAME] =<param1>[,param2]	OKor ERROR/+CME ERROR:<err> ERROR/+CME ERROR: <err>
+ [NAME] ?	+ [NAME] : <param1>[,<param2>]
+ [NAME] =?	+ [NAME] :(list of supported <param1>s)

1.4.3 Field

// explain the detail proto type (Integer or String) and the meaning of possible value for each fields

<param1>: Integer; Indicates the state of ...

0 detach state

1 attached state

<param2>: string; Indicates the state of ...

“CS” circuit switching

“PS” packet switching

2. V.25ter AT Commands

2.1 ATA

2.1.1 Description

Answers and initiates a connection to an incoming call.

2.1.2 Format

Execution command : ATA

2.1.3 Field

Type	Short name	Parameter/comment
String	text	28800 Connected with data bit rate of 28800 bits/s (HSCSD) 19200 Connected with data bit rate of 19200 bits/s (HSCSD) 14400 Connected with data bit rate of 14400 bits/s (HSCSD) 9600 Connected with data bit rate of 9600 bits/s 4800 Connected with data bit rate of 4800 bits/s 2400 Connected with data bit rate of 2400 bits/s

2.1.4 Response

Execution command:

- CONNECT
- CONNECT<text>
- NO CARRIER
- ERROR

2.2 ATD

2.2.1 Description

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

2.2.2 Format

Execution command: ATD<dial string>

Memory dial command: ATD<n>

2.2.3 Field

Type	Short name	Parameter/comment
String	dial string	.0 1 2 3 4 5 6 7 8 9 +. Valid characters for origination W The W modifier is ignored but is included for compatibility reasons only , The comma modifier is ignored but is included for compatibility reasons only ; Informs the Infrared Modem that the number is a voice number rather than a data number T The T modifier is ignored but is included only for compatibility purposes P The P modifier is handled (pulse DTMF dialing functionality)
String	text	28800 Connected with data bit rate of 28800 bits/s (HSCSD) 19200 Connected with data bit rate of 19200 bits/s (HSCSD) 14400 Connected with data bit rate of 14400 bits/s (HSCSD) 9600 Connected with data bit rate of 9600 bits/s 4800 Connected with data bit rate of 4800 bits/s 2400 Connected with data bit rate of 2400 bits/s

2.2.4 ResponseExecution command:

CONNECT

CONNECT <text>

NO CARRIER

ERROR

OK

2.3 ATE

2.3.1 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.

2.3.2 Format

Execution command: ATE[<value>]

2.3.3 Field

Type	Short name	Parameter/comment
Integer	value	0 DCE does not echo characters during command state and online command state. 1 DCE echoes characters during command state and online command state.

2.3.4 Response

Execution command: OK

2.4 ATH

2.4.1 Description

Terminates a connection.

2.4.2 Format

Execution command: ATH

2.4.3 Response

Execution command:

- NO CARRIER
- OK

2.4.4 Note

In non-UCM projects (excluding Neptune Gemini with BT supported) projects, ATH can only hang up the call from the same source. In UCM project , ATH command will sent to MMI for SYNC

2.5 ATI

2.5.1 Description

Request Identification Information.

2.5.2 Format

Execution command: ATI

2.5.3 Field.

Type	Short name	Parameter/comment
Integer	value	used to select from among multiple types of identifying information
String	text	Product information

2.5.4 Response

Execution command: <text>

2.6 ATP

2.6.1 Description

Select pulse dialing. (This setting is ignored.)

2.7 AT@F

2.7.1 Description

Set to factory-defined configuration

2.7.2 Format

Set command: AT@F

2.7.3 Field

Type	Short name	Parameter/comment
Integer	value	0 Set parameters to factory defaults.

2.7.4 Response

Setcommand: OK | ERROR | +CME ERROR:<err>

3. AT Commands – General Commands

3.1 AT+CGMI – Request manufacturer identification

3.1.1 Description

The command causes the phone to return one or more lines of information text

<manufacturer> which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to.

3.1.2 Format

Command	Possible response(s)
+CGMI	<manufacturer> +CME ERROR: <err>
+CGMI=?	OK

3.2 AT+CGMM – Request model identification

3.2.1 Description

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

3.2.2 Format

Command	Possible response(s)
+CGMM	<model> +CME ERROR: <err>
+CGMM=?	OK

3.3 AT+CGMR – Request revision identification

3.3.1 Description

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

3.3.2 Format

Command	Possible response(s)
+CGMR	<revision> +CME ERROR: <err>
+CGMR=?	OK

3.4 AT+CGSN – Request product serial number identification

3.4.1 Description

Returns the IMEI number of the phone.

3.4.2 Format

Command	Possible response(s)
+CGSN	<IMEI> +CME ERROR: <err>
+CGSN=?	OK

3.4.3 Informative example

AT+CGSN

490154203237518

OK

3.5 AT+CSCS – Select TE character set

3.5.1 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.

3.5.2 Format

Command	Possible response(s)
+CSCS=<chset>	OK
+CSCS?	+CSCS: <chset>
+CSCS=?	+CSCS: (list of supported<chset>s)

3.5.3 Field

"GSM" GSM 7 bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF) problems

"HEX" character strings consist only of hexadecimal numbers from 00 toFF;
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.

"IRA" international reference alphabet (ITU-T T.50 [13])

"PCCP437" PC character set Code Page43

"UCS2"	16-bit universal multiple-octet coded character set (ISO/IEC10646[32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16- bit characters with decimal values 65, 98 and 99"8859-1" ISO8859 Latin character set
"8859-1"	ISO 8859 Latin character set
"UCS2_0X81"	

The supported parameters are subject to change according to different compile directives(options).

3.6 AT+CIMI – Request international mobile subscriber identity

3.6.1 Description

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

3.6.2 Format

Command	Possible response(s)
+CIMI	<IMSI> +CME ERROR: <err>
+CIMI=?	OK

4. AT Commands – Call Control Commands

4.1 AT+CSTA – Select type of address

4.1.1 Description

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

4.1.2 Format

Command	Possible response(s)
+CSTA=[<type>]	OK or ERROR
+CSTA?	+CSTA: <type>
+CSTA=?	+CSTA: (list of supported<type>s)

4.1.3 Field

<type>: type of address octet in integer format (refer 3GPP TS 24.008 [8] subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129

4.1.4 Note

If '+' appears at the beginning of <dial string>, the TON to network is set to 145, otherwise we use the setting of +CSTA.

4.2 AT+CMOD – Call mode

4.2.1 Description

Selects the call mode for future dialing commands or for the next answering command.

4.2.2 Form

Command	Possible response(s)
+CMOD=[<mode>]	OK
+CMOD?	+CMOD:<mode>
+CMOD=?	+CMOD: (list of supported<type>s)

4.2.3 Field

<mode>:

- | | |
|---|---|
| 0 | single mode |
| 2 | alternating voice/data(bearer service 61) |
| 3 | voice followed by data(bearer service 81) |

4.3 AT+CHUP – Hang upcall

4.3.1 Description

Request to hang up the current GSM call.

4.3.2 Format

Command	Possible response(s)
+CHUP	OK
+CHUP=?	OK

4.3.3 Note

In non-UCM projects (excluding Neptune Gemini with BT supported) projects,

AT+CHUP can only hang up the call from the same source. In UCM project , this command will sent to MMI for SYNC

4.4 AT+CR – Service reporting control

4.4.1 Description

Service reporting control.

Set command controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted.

4.4.2 Format

Command	Possible response(s)
+CR=[<mode>]	
+CR?	+CR: <mode>
+CR=?	+CR: (list of supported<mode>s)

4.4.3 Field

<mode>:

0 disables reporting

1 enables reporting

<serv>:

ASYNC asynchronous transparent

SYNC synchronous transparent

REL ASYNC asynchronous non-transparent

REL SYNC synchronous non-transparent

4.5 AT+CEER – Extended error report

4.5.1 Description

Execution command causes the TA to return one or more lines of information text

<report>, which offer the user of the TA an extended report of the reason for

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

the last call release;

4.5.2 Format

Command	Possible response(s)
+CEER	+CEER: <cause>,<report>
+CEER=?	

4.5.3 Field

<cause>: cause value listed in GSM 04.08 annex H.

<report>: string type describes cause value.

Note: For error cause other than those listed in GSM 04.08 annex H.

+CEER: 128 ,”ERROR_CAUSE_UNKNOWN” will be given.

If there is no error happened , +CEER: 0 ,”NONE” will be given.

4.6 AT+CRIC – Cellular result code

4.6.1 Description

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

4.6.2 Format

Command	Possible response(s)
+CRC=[<mode>]	
+CRC?	+CRC: <mode>
+CRC=?	+CRC: (list of supported<mode>s)

4.6.3 Field

<mode>:

0 disables extended format

1 enables extended format

<type>:

ASYNC asynchronous transparent

SYNC synchronous transparent

REL ASYNC asynchronous non-transparent

REL SYNC synchronous non-transparent

VOICE normal voice (TS 11)

VOICE/XXX voice followed by data (BS 81) (XXX is ASYNC, SYNC, REL ASYNC or REL SYNC)

ALT VOICE/XXX alternating voice/data, voice first (BS 61)

ALT XXX/VOICE alternating voice/data, data first (BS 61)

GPRS GPRS network request for PDP context activation

4.7 AT+CSNS – Single numbering scheme

4.7.1 Description

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

4.7.2 Format

Command	Possible response(s)
+CSNS=[<mode>]	
+CSNS?	+CSNS: <mode>
+CSNS=?	+CSNS: (list of supported <mode>s)

4.7.3 Field

<mode>:

0	Voice
3	alternating voice/data, voice first (BS 61)
4	data
6	alternating voice/data, data first (BS 61)
7	voice followed by data (BS 81)

4.8 AT+CVHU – Voice hangup control

4.8.1 Description

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

4.8.2 Format

Command	Possible response(s)
+CVHU=[<mode>]	OK

+CVHU?	+CVHU:<mode>
+CVHU=?	+CVHU:(list of supported <mode>s)

4.8.3 Field

<mode>:

0 "Drop DTR" ignored but OK response given. ATH disconnects.

1 "Drop DTR" and ATH ignored but OK response has given.

4.9 AT+ECPI – Call progress information

4.9.1 Description

To enable/disable call progress information

4.9.2 Format

Command	Possible response(s)
+ECPI=<mode>	OK
+ECPI?	+ECPI: <mode>
+ECPI=?	+ECPI: (0-4294967295)

4.9.3 Field

<mode>: is a 32 bit unsigned integer value. Each bit represents the report mode of each event.

i.e. You can enable/disable specific +ECPI event

[NOTE]

+ECPI:<call_id>, <msg_type>, <is_ibt>, <is_tch>, <dir>, <call_mode>,

<number>,<type>, "<pau>"*,<disc_cause>+

Type	Short name	Parameter/comment	
integer	Call_id	Call id for this call	
integer	msg_type	0	CLCC_MT_CALL
		1	CSMCC_DISCONNECT_MSG
		2	CSMCC_ALERT_MSG
		3	CSMCC_CALL_PROCESS_MSG
		4	CSMCC_SYNC_MSG
		5	CSMCC_PROGRESS_MSG
		6	CSMCC_CALL_CONNECTED_MSG
		129	CSMCC_ALL_CALLS_DISC_MSG
		130	CSMCC_CALL_ID_ASSIGN_MSG
		131	CSMCC_STATE_CHANGE_HELD
		132	CSMCC_STATE_CHANGE_ACTIVE
		133	CSMCC_STATE_CHANGE_DISCONNECTED
		134	CSMCC_STATE_CHANGE_MO_DISCONNECTING
integer	is_ibt	0	No in band tone
		1	In band tone assigned
integer	is_tch	0	No TCH assigned
		1	TCH assigned
integer	dir	0	CLCC_MO_CALL

		1	CLCC_MT_CALL
integer	call_mode	0	CLCC_VOICE_CALL
		1	CLCC_DATA_CALL
		3	CLCC_VFD_VOICE
		4	CLCC_AVD_VOICE
		5	CLCC_AVF_VOICE
		6	CLCC_VFD_DATA
		7	CLCC_AVD_DATA
		20	IMS_VOICE_CALL
		21	IMS_VIDEO_CALL
		22	IMS_VOICE_CONFERENCE
String	Number	Calling/called number	
integer	Type	145	International call
		129	National call
String	Pau	P-Asserted-URI	
Integer	disc_cause	see Design Note	

Type	Short name	Parameter/comment	
Integer	mode	CSMCC_SETUP_MSG(MTII)	Any value that bit 1 is 1
		CSMCC_DISCONNECT_MSG	Any value that bit 2 is 1
		CSMCC_ALERT_MSG	Any value that bit 3 is 1
		CSMCC_CALL_PROCESS_MSG	Any value that bit 4 is 1
		CSMCC_SYNC_MSG	Any value that bit 5 is 1
		CSMCC_PROGRESS_MSG	Any value that bit 6 is 1
		CSMCC_CALL_CONNECTED_M SG	Any value that bit 7 is 1
		CSMCC_ALL_CALLS_DISC_M SG	Any value that bit 8 is 1
		CSMCC_CALL_ID_ASSIGN_M SG	Any value that bit 9 is 1
		CSMCC_STATE_CHANGE_HEL D	Any value that bit 10 is 1
		CSMCC_STATE_CHANGE_ACT IVE	Any value that bit 11 is 1 11 is 1
		CSMCC_STATE_CHANGE_DIS CONNECTED	Any value that bit 12 is 1 12 is 1
CSMCC_STATE_CHANGE_MO DISCONNECTING	Any value that bit 13 is 1 13 is 1		

ex: AT+ECPI=257.

257 = 0x101 = 0001 00000001

So only event 1 (CSMCC_SETUP_MSG) and event 9 (CSMCC_CALL_ID_ASSIGN_MSG) report is enabled.

4.9.4 Design Notes

4.9.4.1 Call Disconnection Cause

1. <disc_cause> is only provided for CSMCC_DISCONNECT_MSG event, which is sent when modem receive RELEASE or RELEASE COMPLETE CC message from the Network.

2. <disc_cause> is defined in SPEC 24.008 Annex H. ex: CM_USER_BUSY (17) for Call Control cause.

0 Please refer to l3_inc_enums.h (under mcu\ps\interfaces\enum)

3 before HAL revise.

4 Please refer to ps_public_enum.h (under mcu\interfaces\modem) after HAL revise

3. Call application shall monitor CSMCC_CALL_DISCONNECTED event for all call disconnection event. That's because not every call disconnection event has <disc_cause>, ex: the MO call setup fail in local, may be MM connection setup fail. In such case, there will be no Call Control cause from Network.

For call application want to get <disc_cause>, it shall also monitor CSMCC_DISCONNECT_MSG event to get <disc_cause>. And it's guaranteed that CSMCC_DISCONNECT_MSG (for call_id=x) must come before CSMCC_CALL_DISCONNECTED (for call_id = x). Thus, call application can keep the <cause> for call_id = x when receiving CSMCC_DISCONNECT_MSG (for call_id =x) first and use it as the <disc_cause> when receiving CSMCC_CALL_DISCONNECTED (for call_id = x)

4.9.4.2 Paur

It is P-Asserted-Identity and format is PAssertedID-value * (COMMAPAssertedID- value)

PAssertedID-value = name-addr /addr-spec

name-addr = [display-name] LAQUOT addr- spec RAOUOT

addr-spec= SIP-URI/SIPS-URI/absoluteURI

please refer to RFC3325 chapter 9.1 and RFC3261 Chapter 25.1 for detail information

Example: name-addr

“dan” <sip:dan.lee@mediatek.com>

Oraddr-spec sip:dan.lee@mediatek.com tel:123456

4.10 AT+EALS – Line switch

4.10.1 Designnote

Used to set or get line id in MS, originally, there is no such command.

4.10.2 Format

Command	Possible Response(s)
+EALS=<line_id>	OK or ERROR
+EALS?	+EALS: <line_id>
+EALS=?	+EALS: (0,1)

4.10.3 Field

Type	Short name	Parameter/comment	
Integer	Line_id	0	Line 1
		1	Line 2

4.11 AT+EVTS – Send DTMF

4.11.1 Design note

This command is intended to be send START_DTMF and STOP_DTMF message to NW separately. AP can send START_DTMF when keypad is pressed and send STOP_DTMF when keypad is released. The result code will be given immediately. if __VTS_LATE_RESPONSE__ is turned on, "OK" is printed when SEND DTMF is acknowledged by network.

4.11.2 Format

Command	Possible Response(s)
+EVTS=<mode>[,<DTMF_d]	OK or ERROR

+EVTS =?	+EVTS:0,1,2,3,4,5,6,7,8,9,#,*
----------	-------------------------------

4.11.3 Field

Type	Short name	Parameter/comment
Integer	mode	<mode>=0 for START DTMF <mode>=1 for STOP DTMF
String	DTMF digit	This field is only necessary when <mode>=0 It'sasingledigit ex: "3", "#"

4.11.4 Example

Send DTMF "123"

AT+EVTS=0,"1"

OK

AT+EVTS=1

OK

AT+EVTS=0,"2"

OK

AT+EVTS=1

OK

AT+EVTS=0,"3"

OK

AT+EVTS=1

OK

4.12 AT+FCLASS

4.12.1 Description

This command is used to puts the TA into a particular mode of operation (data, fax, voice etc.).

4.12.2 Format

Command	Possible response(s)
+FCLASS=<n>	OK
+FCLASS?	<n>
+FCLASS=?	<list of supported <n>s)

4.12.3 Field

<n>:

0	data
1	fax class 1(TIA-578-A)
2	fax (manufacturer specific)
2.0	fax class 2(ITU-T Recommendation T.32[12] and TIA-592)

5. AT Commands –Network Service

Related Commands

5.1 AT+CNUM – Subscriber number

5.1.1 Description

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

5.1.2 Format

Command	Possible response(s)
+CNUM	+CNUM:[<alpha1>],<number1>,<type1> [<CR><LF>+CNUM:[<alpha2>],<number2>,<type2>] [...] +CME ERROR: <err>
+CNUM=?	OK

5.2 AT+CREG – Network registration

5.2.1 Description

Set command controls the presentation of an unsolicited result code +CREG:

<stat> when <n>=1 and there is a change in the MT network registration status, or code +CREG:<stat>[,<lac>,<ci>[,<Act>]]when<n>=2andthereisachangeofthenetworkcell. The value <n>=3 further extends the unsolicited result code with[,<cause_type>,<reject_cause>], when available, when the value <stat>changes.

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. The parameters [, <cause_type>, <reject_cause>], if available, are returned when<n=3>.

5.2.2 Format

Command	Possible response(s)
+CREG=[<n>]	
+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>[,<Act>]] +CME ERROR: <err>
+CREG=?	+CREG: (list of supported <n>s)

5.2.3 Field

<n>:

- | | |
|---|--|
| 0 | disable network registration unsolicited result code |
| 1 | enable network registration unsolicited result code +CREG:<stat> |
| 2 | enable network registration and location information unsolicited result code

+CREG: <stat>[,<lac>,<ci>[,<Act>]] |
| 3 | enable network registration, location information and cause value information unsolicited result code |

+CREG: <state> [, <lac>, <ci>, [<Act>] [, <cause_type>, <reject_cause>]]

<stat>:

- | | |
|---|---|
| 0 | not registered, MT is not currently searching a new operator to register to |
| 1 | registered, home network |
| 2 | not registered, but MT is currently searching a new operator to register to |
| 3 | registration denied |
| 4 | unknown |

-
- | | |
|----|--|
| 5 | registered,roaming |
| 6 | registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN) |
| 7 | registered for "SMS only", roaming (applicable only when<AcT> indicates E-UTRAN) |
| 8 | attached for emergency bearer services only (see NOTE 2)(not applicable) |
| 9 | registered for "CSFB not preferred", home network (applicable only when <AcT> indicates E-UTRAN) |
| 10 | registered for "CSFB not preferred", roaming (applicable only when<AcT> indicates E-UTRAN) |

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; four byte cell ID in hexadecimal format

<Act>:

- | | |
|---|------------------------|
| 0 | GSM |
| 2 | UTRAN |
| 3 | GSMw/EGPRS |
| 4 | UTRANw/HSDPA |
| 5 | UTRANw/HSUPA |
| 6 | UTRAN w/HSDPA andHSUPA |
| 7 | E-UTRAN |

<cause_type>: integer type; indicates the type of <reject_cause>.

- | | |
|---|--|
| 0 | Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] |
|---|--|

1 Indicates that <reject_cause> contains a manufacturer specific cause.

<reject_cause>: integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.

5.3 AT+COPS – Operator selection

5.3.1 Description

Set command forces an attempt to select and register the GSM/UMTS network operator.

If the selected operator is not available, ERROR is returned.

Read command returns the current mode, the currently selected operator. Test command returns operator list present in the network.

5.3.2 Format

Command	Possible response(s)
+COPS=<mode>[,<format>,<oper>[,< Act>]]	+CME ERROR: <err>
+COPS?	+COPS:<mode>[,<format>,<oper>,<Act>] +CME ERROR: <err>

5.3.3 Field

<mode>:

- 0 automatic (<oper> field is ignored)
- 1 manual (<oper> field shall be present)
- 2 deregister from network
- 3 set only <format> (for read command +COPS?), do not attempt registration/deregistration

<format>:

- 0 long format alphanumeric<oper>

- 1 short format alphanumeric<oper>
- 2 numeric<oper>
- 3 repot PLMN list result with LAC in<lac>

<oper>: string type

<stat>:

- 0 unknown
- 1 available
- 2 current
- 3 forbidden

<Act>

- 0 GSM
- 2 UTRAN

5.4 AT+CLCK – Facility lock

5.4.1 Description

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

5.4.2 Format

Command	Possible response(s)
---------	----------------------

<p>+CLCK=<fac>,<mode>[,<passwd>[,<class>]]</p>	<p>+CME ERROR: <err></p> <p>when <mode>=2 and command successful:</p> <p>+CLCK: <status>[,<class1>]</p> <p>[<CR><LF>+CLCK: <status>,<class2>]</p> <p>[...]</p>
<p>+CLCK=?</p>	<p>+CLCK: (list of supported <fac>s)</p> <p>+CME ERROR: <err></p>

5.4.3 Field

<fac> : "PF", "SC", "AO", "OI", "OX", "AI", "IR", "AB", "AG", "AC", "FD", "PN", "PU", "PP", "PC"

<mode>:

- 0 unlock
- 1 lock
- 2 query status ("AB", "AC", "AG" not support query mode)

<status>:

- 0 not active
- 1 active

<passwd>: string type

<classx> is a sum of integers each representing a class of information (default 7):

- 1 voice (telephony)
- 2 data (refers to all bearer services)

- 8 short message service
- 16 data circuit sync
- 32 data circuit async
- 64 dedicated packet access
- 128 dedicated PAD access

5.5 AT+CPWD – Change password

5.5.1 Description

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

5.5.2 Format

Command	Possible response(s)
+CPWD=<fac>,<oldpwd>,<newpwd>	+CME ERROR: <err>
+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s

5.5.3 Field

<fac>:

"P2" SIM PIN2

Refer Facility Lock +CLCK for other values

<oldpwd>, <newpwd>: string type;

<pwdlength>: integer type maximum length of the password for the facility

5.6 AT+CLIP – Calling line identification presentation

5.6.1 Description

Requests calling line identification. Determines if the +CLIP unsolicited result code is activated. When the presentation of the CLI at the TE is enabled (and calling subscriber allows),

+CLIP:<number>,<type>[,<subaddr>,<satype>[,<alpha>][,<CLI_validity>]]response is returned after every RING.

5.6.2 Format

Command	Possible response(s)
+CLIP=[<n>]	OK
+CLIP?	+CLIP: <n>,<m>
+CLIP=?	+CLIP: (list of supported<n>s)

5.6.3 Field

<n> (parameter sets/shows the result code presentation status to the TE):

0 disable

1 enable

<m> (parameter shows the subscriber CLIP service status in the network):

0 CLIP not provisioned

1 CLIP provisioned

2 unknown (e.g. no network,etc)

<number>: string type phone number of format specified by<type>

<type>: type of address octet in integer format (refer TS 24.008 [8] subclause10.5.4.7)

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format (refer TS 24.008 [8] subclause 10.5.4.8)

<alpha>: optional string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE

Character Set +CSCS

<CLI_validity>: integer type. This parameter can provide details why

<number>: does not contain a calling party BCD number

- | | |
|---|---|
| 0 | CLI valid |
| 1 | CLI has been withheld by the originator |
| 2 | CLI is not available due to interworking problems or limitations of originating network |

5.7 AT+CLIR – Calling line identification restriction

5.7.1 Description

Requests calling line identification restriction.

5.7.2 Format

Command	Possible response(s)
+CLIR=[<n>]]	OK
+CLIR?	+CLIR: <n>,<m>
+CLIR=?	+CLIR: (list of supported<n>s)

5.7.3 Field

<n> (parameter sets the adjustment for outgoing calls):

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

<m> (parameter shows the subscriber CLIR service status in the network):

- | | |
|---|----------------------|
| 0 | CLIR not provisioned |
|---|----------------------|

- | | |
|---|---|
| 1 | CLIR provisioned in permanent mode |
| 2 | unknown (e.g. no network,etc) |
| 3 | CLIR temporary mode presentation restricted |
| 4 | CLIR temporary mode presentation allowed |

5.8 AT+COLP – Connected line identification presentation

5.8.1 Description

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

When enabled (and called subscriber allows), +COLP: <number>, <type> [, <subaddr>, <satype> [, <alpha>]] intermediate result code is returned from TA to TE before any +CR or V.250 [14] responses.

5.8.2 Format

Command	Possible response(s)
+COLP=[<n>]	
+COLP?	+COLP: <n>,<m>
+COLP=?	+COLP: (list of supported<n>s)

5.8.3 Field

<n> (parameter sets/shows the result code presentation status to the TE):

- | | |
|---|---------|
| 0 | disable |
| 1 | enable |

<m> (parameter shows the subscriber COLP service status in thenetwork):

- | | |
|---|----------------------|
| 0 | COLP not provisioned |
|---|----------------------|

1 COLP provisioned

2 unknown (e.g. no network,etc.)

<number>, <type>, <subaddr>, <satype>, <alpha>: refer +CLIP

5.9 AT+COLR – Connected line identification restriction status

5.9.1 Designnote

Used to query COLR status in network.

5.9.2 Format

Command	Possible Response(s)
+COLR?	+COLR:<status>
+COLR =?	OK

5.9.3 Field

Type	Short name	Parameter/comment	
Integer	Line_id	0	Not provision
		1	provision
		2	Unknown

5.10 AT+CNAP – Calling name identification presentation

5.10.1 Description

This command refers to the supplementary service CNAP (Calling Name Presentation) according to 3GPP TS 22.096 that enables a called subscriber to get a calling name indication (CNI) of the calling party when receiving a mobile terminated call. Set command enables or disables the presentation of the CNI at the TE. It has no effect on the execution of the supplementary service CNAP in the network. When <n>=1, the presentation of the calling name indication at the TE is enabled and CNI is provided the unsolicited result code. Read command gives the status of <n>, and also triggers an interrogation

of the provision status of the CNAP service according 3GPP TS 22.096 (given in <m>). Test command returns values supported as a compound value.

5.10.2 Format

Command	Possible Response(s)
+CNAP?	+CNAP:<n>,<m>
+CNAP=<n>?	OK

5.10.3 Field

<n>: integer type (parameter sets/shows the result code presentation status to the TE)

0 disable

1 enable

<m>: integer type (parameter shows the subscriber CNAP service status in the network)

0 CNAP not provisioned

1 CNAP provisioned

2 unknown (e.g. no network,etc.)

<name>: string type, up to 80 characters long string containing the calling name

<CNI_validity>: integer type

0 CNI valid

1 CNI has been with held by the originator.

2 CNI is not available due to interworking problems or limitations of originating network.

When CNI is not available (<CNI_validity>=2), <name> shall be an empty string (""). When CNI has been with held by the originator, (<CNI_validity>=1) and the CNAP is provisioned with the "override category" option (refer 3GPP TS 22.096 and 3GPP TS 23.096), <name> is provided. Otherwise, TA shall return the same setting for <name> as if the CNI was not available.

5.11 AT+CCUG – Closed user group

5.11.1 Description

This command allows control of the Closed User Group supplementary service. Set command enables the served subscriber to select a CUG index, to suppress the Outgoing Access (OA), and to suppress the preferential CUG.

5.11.2 Format

Command	Possible response(s)
+CCUG=[<n>[,<index>[,<info>]]]	OK
+CCUG?	+CCUG: <n>,<index>,<info> OK
+CCUG=?	OK

5.11.3 Field

<n>:

- 0 disable CUG temporary mode
- 1 enable CUG temporary mode

<index>:

- 0...9 CUG index
- 10 no index (preferred CUG taken from subscriber data)

<info>:

- 0 no information
- 1 suppress OA
- 2 suppress preferential CUG
- 3 suppress OA and preferential CUG

5.12 AT+CCFC – Call forwarding number and conditions

5.12.1 Description

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

5.12.2 Format

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

5.12.3 Field

<reason>:

0	unconditional
1	mobile busy
2	no reply
3	not reachable
4	all call forwarding
5	all conditional call forwarding

<mode>:

- | | |
|---|--------------|
| 0 | disable |
| 1 | enable |
| 2 | query status |
| 3 | registration |
| 4 | erasure |

<number>: string type phone number of forwarding address in format specified by

<type>

<type>: type of address

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format; default 128

<classx> is a sum of integers each representing a class of information (default 7):

- | | |
|-----|--------------------------------------|
| 1 | voice(telephony) |
| 2 | data (refers to all bearer services) |
| 8 | short message service |
| 16 | data circuitsync |
| 32 | data circuitasync |
| 64 | dedicated packet access |
| 128 | dedicated PADaccess |

<time>:

1...30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded

<status>:

- 0 not active
- 1 active

5.13 AT+CCWA – Call waiting

5.13.1 Description

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

5.13.2 Format

Command	Possible response(s)
+CCWA=[<n>[,<mode>[,<class>]]]	+CME ERROR: <err> when <mode>=2 and command successful +CCWA: <status>,<class1> [<CR><LF>+CCWA: <status>,<class2> [...]]
+CCWA?	+CCWA: <n>
+CCWA=?	+CCWA: (list of supported <n>s)

5.13.3 Field

<n> (sets/shows the result code presentation status to the TE):

- 0 disable
- 1 enable

<mode> (when <mode> parameter is not given, network is not interrogated):

-
- | | |
|---|--------------|
| 0 | disable |
| 1 | enable |
| 2 | query status |

<classx> is a sum of integers each representing a class of information (default 7):

- | | |
|-----|--------------------------------------|
| 1 | voice(telephony) |
| 2 | data (refers to all bearer services) |
| 8 | short message service |
| 16 | data circuitsync |
| 32 | data circuitasync |
| 64 | dedicated packet access |
| 128 | dedicated PAD access |

<status>:

- | | |
|---|------------|
| 0 | not active |
| 1 | active |

<number>: string type phone number of calling address in format specified by <type>

<type>: type of address octet in integer format

5.14 AT+CHLD – Call related supplementary services

5.14.1 Description

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

5.14.2 Format

Command	Possible response(s)
+CHLD=[<n>]	+CME ERROR: <err>
+CHLD=?	[+CHLD: (list of supported<n>s)]

5.14.3 Field

<n> (sets/shows the result code presentation status to the TE):

- 0 Releases all held calls, or sets User-Determined User Busy for a waiting call
- 1 Releases all active calls and accepts the other (waiting or held) call
- 1x Releases the specific active call X
- 2 Places all active calls on hold and accepts the other (held or waiting) call'
- 2x Places all active calls, except call X, on hold
- 3 Adds a held call to the conversation
- 4 Connects two calls and disconnects the subscriber from both calls
- 5 Activate the Completion of Calls to Busy Subscriber Request.(CCBS)

5.15 AT+CUSD – Unstructured supplementary service data

5.15.1 Description

Allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile-initiated operations are supported. This command is used to enable the unsolicited result code +CUSD. For an USSD response from the network, or a network initiated operation, the format is: +CUSD: <m>[,<str>,<dc>].

5.15.2 Format

Command	Possible response(s)
+CUSD=[<n>[,<str>[,<dc>]]]	+CME ERROR: <err>

+CUSD?	+CUSD: <n>
+CUSD=?	+CUSD: (list of supported <n>s)

5.15.3 Field

<n>:

- 0 disable the result code presentation to the TE
- 1 enable the result code presentation to the TE
- 2 cancel session (not applicable to read command response)

<str>: string type USSD string

<dc>: Cell Broadcast Data Coding Scheme in integer format (default 15)

<m>:

- 0 no further user action required
- 1 further user action required
- 2 USSD terminated by network
- 3 other local client has responded
- 4 operation not supported
- 5 network time out

Note: we only support m = [0,1,2,4] now, and we use m=4 to represent the USSDERROR case.

5.16 AT+ECUSD – Execute SS/USSD operation

5.16.1 Description

Used to give whole SS/USSD to modem, so that SS control by SIM can be done by CSMSS, and the BS code in the string will not be translate into classx. Originally, RIL will translate the BS code in SS string to classx and then give to modem, but there are some BS code can not be one-by-one mapping to classx, and it will cause some problem, ex: FTA case is fail, and can not do SS control by SIM.

Therefore, modem provides this command to do related SS/USSD operation.

If argument `<cf_num_len>` is carried, it implies `<string>` is a standard SS string to register Call Forwarding Supplementary Service. Modem could recognize the forwarding number in the `<string>` via this information to resolve the problem when forwarding number contains character '*'. Please note that this command will return OK immediately for USSD operation, and report USSD result by +CUSD URC. As for SS operation, OK will followed by final result (+CCWA/CCFC/CLCK/CLIR/CLIP), and the classx will be replaced by BS code form CSMCC directly, L4C will not translate it to classx again.

5.16.2 Format

Command	Possible Response(s)
+ECUSD=<m>,<n>[,<string>[,<dcs>]][,<cf_num_len>]]	OK
+ECUSD=?	OK
+ECUSD?	+ECUSD: <version> OK or ERROR

5.16.3 Field

Type	Short name	Parameter/comment	
Integer	m	1	For SS operation
		2	For USSD operation
integer	n	1	For excuting SS/USSD (when <m>=1, default value of <n> should be 1)
		2	For cancel USSD session(only support when <m>=2)
string	string	SS or USSD string in ASCII format	

integer	dcs	Cell Broadcast Data Coding Scheme in integer format (default 0). This parameter is supposed to be 0x0f. To support other coding scheme needs to turn on specific compile option.	
integer	cf_num_len	The length of forwarding number	
integer	version	1	The modem includes M0LY00032002
		Other value	reserved

5.16.4 Note

- This command is responded before actually receiving the execution result from the network. It is responded after FDN checked by PHB to prevent user waiting for a long duration of network response time.
- This command is only supported in modem load and when the command compile option is turned on.

5.17 AT+CSSN – Supplementary service notifications

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

When $\langle m \rangle = 1$ and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU: $\langle \text{code2} \rangle [\langle \text{index} \rangle [\langle \text{number} \rangle [\langle \text{type} \rangle [\langle \text{subaddr} \rangle [\langle \text{satype} \rangle]]]]]]$ is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP") and when several different $\langle \text{code2} \rangle$ s are received from the network, each of them shall have its own +CSSU result code.

5.17.2 Format

Command	Possible response(s)
+CSSN=[<n>[,<m>]]	
+CSSN?	+CSSN: <n>,<m>
+CSSN=?	+CSSN: (list of supported <n>s),(list of supported <m>s)

5.17.3 Field

<n> (parameter sets/shows the +CSSI result code presentation status to the TE):

0 disable

1 enable

<m> (parameter sets/shows the +CSSU result code presentation status to the TE):

0 disable

1 enable

<code1> (it is manufacturer specific, which of these codes are supported):

0 unconditional call forwarding is active

1 some of the conditional call forwardings are active

2 call has been forwarded

3 call is waiting

4 this is a CUG call (also <index>present)

5 outgoing calls are barred

6 incoming calls are barred

7 CLIR suppression rejected

8 call has been deflected

<index>: refer "Closed user group +CCUG"

<code2> (it is manufacturer specific, which of these codes are supported):

0 this is a forwarded call (MT call setup)

1 this is a CUG call (also <index> present) (MT call setup)

2 call has been put on hold (during a voice call)

3 call has been retrieved (during a voice call)

4 multiparty call entered (during a voice call)

5 call on hold has been released (this is not a SS notification) (during a voice call)

6 forward check SS message received (can be received when ever)

7 call is being connected (alerting) with the remote party in alerting state in explicit call transfer operation (during a voice call)

8 call has been connected with the other remote party in explicit call transfer operation (also number and subaddress parameters may be present) (during a voice call or Mt call setup)

9 this is a deflected call (MT call setup)

10 additional incoming call forwarded

<number>: string type phone number of format specified by <type>

<type>: type of address octet in integer format

<subaddr>: string type subaddress of format specified by <satype>

<satype>: type of subaddress octet in integer format

5.18 AT+CLCC – List current calls

5.18.1 Description

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

5.18.2 Format

Command	Possible response(s)
+CLCC	[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>] [<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>] [...]] OK/+CME ERROR: <err>
+CLCC=?	OK

5.18.3 Field

<idx>: integer type; call identification number

this number can be used in +CHLD command operations

<dir>:

0 mobile originated (MO) call

1 mobile terminated (MT) call

<stat> (state of the call):

0 active

1 held

2 dialing (MO call)

3 alerting (MO call)

4 incoming (MT call)

5 waiting (MT call)

<mode> (bearer/teleservice):

- 0 voice
- 1 data
- 3 voice followed by data, voice mode
- 4 alternating voice/data, voice mode
- 6 voice followed by data, data mode
- 7 alternating voice/data, data mode

Command	Possible response(s)
+CPOL=[<index>][,<format>[,<oper>[<GSM_AcT>,<GSM_compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]]	+CME ERROR: <err>
+CPOL?	+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<EUTRAN_AcT1>] [<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<EUTRAN_AcT2>] [...]] +CME ERROR: <err>
+CPOL=?	+CPOL: (list of supported <index>s), (list of supported <format>s) +CME ERROR: <err>

- 9 unknown

<mpty>:

- 0 call is not one of multiparty (conference) call parties

1 Call is one of multiparty(conference) call parties

<number>: string type phone number in format specified by<type>

<type>: type of address octet in integer format

5.19 AT+CPOB – Preferred operator list

5.19.1 Description

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

5.19.2 Format

5.19.3 Field

<indexn>: integer type; the order number of operator in the SIM/USIM preferred operator list

<format>:

0 long format alphanumeric<oper>

1 short format alphanumeric<oper>

2 numeric<oper>

<opern>: string type; <format> indicates if the format is alphanumeric or numeric (see

+COPS)

<GSM_AcTn>: GSM access technology:

0 access technology not selected

1 access technology selected

<GSM_Compact_AcTn>: GSM access technology:

0 access technology not selected

1 access technology selected

<UTRAN_AcTn>: GSM access technology:

0 access technology not selected

1 access technology selected

<E-UTRAN_AcTn>: integer type; E-UTRAN access technology

0 access technology not selected

1 access technology selected

5.20 AT+CPLS – Selection of preferred PLMN list

5.20.1 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. Execute command selects a list in the SIM/USIM. Read command returns the selected PLMN selector list from the SIM/USIM. Test command returns the whole index range supported lists by the SIM/USIM

5.20.2 Format

Command	Possible Response(s)
+CPLS=<list>	+CME ERROR: <err>
+CPLS?	+CPLS: <list>
+CPLS=?	+CPLS: <list of supported<lis>s>+CME ERROR: <err>

5.20.3 Field

<list>: integer type

0 User controlled PLMN selector with Access Technology EF_{PLMNwAcT}, 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}

5.21 AT+WS46 – Select wireless network

5.21.1 Description

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

5.21.2 Format

Command	Possible response(s)
+WS46=[<n>]	
+WS46?	<n>
+WS46=?	(list of supported <n>s)

5.21.3 Field

<n>:25 3GPP Systems (both GERAN and UTRAN)

5.22 AT+EPBSE – Band selection

5.22.1 Description

To set MS band.

5.22.2 Format

Command	Possible response(s)
+EPBSE=<gsm_band> ,<umts_band>	
+EPBSE?	+EPBSE: <gsm_band>,<umts_band>

+EPBSE =?	List of supported bit masks of each band mode +EPBSE: <gsm_band>,<umts_band>
-----------	--

5.22.3 Field

<GSM_band>: integer

bit 1 EGSM900

bit 3 DCS1800

bit 4 PCS1900

bit 7 GSM850

0xff Auto selection → select All supported bands

<UMTS_band>: integer

bit 0 UMTS BAND I : WCDMA-IMT-2000

bit 1 UMTS BAND II : WCDMA-PCS-1900

bit 2 UMTS BAND III : WCDMA-DCS-1800

bit 3 UMTS BAND IV : WCDMA-AWS-1700

bit 4 UMTS BAND V : WCDMA-CLR-850

bit 5 UMTS BAND VI : WCDMA-800

bit 6 UMTS BAND VII : WCDMA-IMT-E-2600

bit 7 UMTS BAND VIII : WCDMA-GSM-900

bit 8 UMTS BAND IX : WCDMA-1800

bit 9 UMTS BAND X : WCDMA-1700

bit 10 ~ bit 31 also supported for extended UMTS band setting according to device capability.

0xffff Auto selection → select All supported bands

<lte_band_1_32>: integer

bitmap for LTE band1 to band 32

0xffffffff Auto selection → select All supported bands

<lte_band_33_64>: integer bitmap for LTE band 33 to band 64

0xffffffff Auto selection → select All supported bands

5.22.4 Example

Set Auto band (select all supported bands)

```
AT+EPBSE=255, 65535
```

OK

Set “EURO band” (GSM-900 / DCS-1800 / WCDMA-IMT-2000)

```
AT+EPBSE=10, 1
```

OK

5.23 AT+ECSQ – Received signal level indication

5.23.1 Description

Set command to enable +ECSQ unsolicited result code

+ECSQ:

<sig1>, <sig2>, <rssi_in_qdbm>, <rscp_in_qdbm>, <ecn0_in_qdbm>, <rsrq_in_qdb>,
<rsrp_in_qdbm>, <Act> [, <rs_snr_qdb> [, <slband>]] which is to indicate the received signal level.

Active command is to query the current received signal level.

Read command returns the current setting of +ECSQ unsolicited result code.

5.23.2 Format

Command	Possible Response(s)
+ECSQ= <flag>	OK or ERROR
+ECSQ?	+ECSQ: <flag>
+ECSQ=?	+ECSQ: (0,1)

5.23.3 Field

Type	Short name	Parameter/comment	
Integer	flag	0	Received signal level indication disable
		1	Received signal level indication enable
Integer	Sig1	0-63	This field is the same as <rscp> in +CESQ when camp on GSM service. (255 means invalid value)
		0-96	This field is the same as <rscp> in +CESQ when camp on UMTS service. (255 means invalid value)
		0-97	This field is the same as <rsrp> in +CESQ when camp on LTE service. (255 means invalid value)
Integer	Sig2	0-7	This field is the same as <ber> in +CESQ when camp on GSM service. (99 means invalid value)

		0-49	This field is the same as <ecn0> in +CESQ when camp on UMTS service. (255 means invalid value)
		0-34	This field is the same as <rsrq> in +CESQ when camp on LTE service. (255 means invalid value)
Integer	rssi_in_qdbm		Negative integer. Received signal strength raw data in quarter dbm when camp on GSM network. (1 means invalid value)
Integer	rscp_in_qdbm		Negative integer RSCP in quarterdbm. Only available when camp on UMTS network. (1 means invalid value)
Integer	ecn0_in_qdbm		Negative integer EcN0 in quarterdbm. Only available when camp on UMTS network. (1 means invalid value)
Integer	rsrq_in_qdb		Negative integer RSRQ in quarter dB. Only available when camp on LTE network. (1 means invalid value)
Integer	rsrp_in_qdbm		Negative integer RSRP in quarterdbm. Only available when camp on LTE network. (1 means invalid value)
		0	GSM

Integer	Act	2	UMTS
		7	LTE
Integer	rs_snr_qdb		RSSNR in quarter dB. RSSNR is signal-to-noise ratio for reference signal. It is available only when camping on a LTE network.
Integer	slband		Serving LTE band.

5.24 AT+ERAT – RAT mode and GPRS/EDGE status

5.24.1 Description

To get RAT mode status and GRRS/EDGE status or set RAT mode of MS

5.24.2 Format

Command	Possible Response(s)
+ERAT?	+ERAT : <Act>, <GPRS status>,<RATmode>,<prefer_rat>
+ERAT=<RATmode>[,<prefer_rat>]	OK /ERROR

5.24.3 Field

<Act>: Access technology of current PLMN

0	GSM
2	UTRAN
3	GSMw/EGPRS
4	UTRANw/HSDPA
5	UTRANw/HSUPA
6	UTRAN w/HSDPA and HSUPA

7 E-UTRAN

255 unknown

<GPRS status>: 0: GPRS

1: EDGE

<RAT mode>: RAT mode setting of MS

0: GSM only

1: UMTS only

2: GSM +UMTS

<prefer_rat>: prefer rat setting

0: No prefer

1: GSM prefer

2: UMTS prefer

5.25 AT+EGTYPE – GPRS connection type

5.25.1 Description

The set command is used to change the GPRS connection type.

The read command is used to read the current GPRS connection type.

5.25.2 Format

Command	Possible Response (s)
+EGTYPE=<type>[,<detach>]	OK or ERROR
+EGTYPE?	+EGTYPE: <type> OK
+EGTYPE=?	+EGTYPE: (0-3) OK

5.25.3 Field

Type	Short Name	Parameter/comment	
Integer	type	0	Set GPRS type to WHEN_NEEDED mode.
		1	Set GPRS type to ALWAYS attach and trigger ATTACH procedure if mode is changed. The GPRS connection type saved in NVRAM will also be changed to always attach.
		2	Set GPRS type to always attach, but don't trigger ATTACH procedure. The GPRS connection type in

Type	Short Name	Parameter/comment	
			NVRAM will not be changed.
		3	The same as type 2. In addition, set FOP flag in the later ATTACH procedure.
Integer	detach	0	Only support when Type = 0. It's the same as AT+EGTYPE=0.
		1	Only support when Type = 0, modem will do PS detach after change to WHEN_NEEDED mode.

5.26 AT+EHSM – HSPA mode

5.26.1 Description

This command is to set or to get HSPA (High Speed Packet Access) mode.

5.26.2 Format

Command	Possible Response(s)
+EHSM=<hspa_access_mode> , <apply_mode>	OK or ERROR
+EHSM?	+EHSM: <hspa_access_mode> OK
+EHSM=?	+EHSM: (supported range of<hspa_access_mode>), (supported range of <apply_mode>)

5.26.3 Field

<hspa_access_mode>: indicates the mode of HSPA

access mode

- 0 –HSPA_OFF
- 1 –HSDPA_ON
- 2 –HSDPA_HSUPA_ON
- 3 –HSPA+ On

<apply_mode>: indicates when will the new setting takes effect:

- 0 –APPLY_AT_RUNTIME

After specifying this, UE saves the setting and resets radio automatically to apply it immediately. During the process time, all connections would be lost and they will NOT be recovered by modem.

- 1 –APPLY_AFTER_REBOOT

After specifying this command, UE saves the setting only. The new setting takes effect at the next bootup

Other values are reserved and will result in an ERROR response to the execution command.

5.27 AT+ESSP

5.27.1 Description

This command is to set the ESSP value stored in NVRAM which configures if to query CFU status by modem itself after first camp-on network.

5.27.2 Format

Command	Possible Response(s)
+ESSP=<mode>	OK ERROR
+ESSP?	+ESSP: <mode> OK

5.27.3 Field

<mode>: integer type.

0 – default mode, query when sim replaced

1 – always not query

2 – always query

5.27.4 Note

In Smart Phone platform, modem does not query CFU status on it's own, it is the upper layer (AP)'s responsibility to control the CFU query procedure. In this case, AP will send AT+ESSP=1.

5.28 AT+CCBS – Completion of calls to busy subscriber

5.28.1 Description

The read mode of this command is used to interrogate the CCBS status of current subscriber; the execute mode of this command is used to erase the CCBS entry of specific<ccbs_id>.

5.28.2 Format

Command	Possible Response(s)
+CCBS=<ccbs_id>	OK+CME ERROR: <err>
+CCBS?	OK+CME ERROR: <err>

5.28.3 Field

<ccbs_id>: integer type. Indicate the ccbs id to be erased.

5.29 AT+ENBR – Show cell system information

5.29.1 Description

This command is used to inquiring serving cell and neighbor cell information in 2G/3G

5.29.2 Format

Command	Possible Response(s)
+ENBR	+2g_server_info:1,cid<id>,lac<lac>,mcc<>,mnc<> Cell1:cid<id>,lac<lac>,mnc<>,mcc<>,arfcn<>,bsic<>,ta<>,rxlev<>,csq_level<>,ber<> +3g_server_info:2,mcc<>,mnc<>,mccid<>,freq_info_used<>,psc<>,lac<> cell:rssi<>,psc<>,mccid<id>,mlac<lac> OK+CME ERROR: <err>
+ENBR?	+2g_server_info:1,cid<id>,lac<lac>,mcc<>,mnc<> Cell1:cid<id>,lac<lac>,mnc<>,mcc<>,arfcn<>,bsic<>,ta<>,rxlev<>,csq_level<>,ber<>.
	+3g_server_info:2,mcc<>,mnc<>,uc<>,freq_info_used<>,psc<>,lac<> cell:rssi<>,psc<>,mccid<id>,mlac<lac>

5.29.3 Field

<baic>: base station identification code

<dBm>: received signal strength in dBm

<rssi>: Receive signal strength

<cid>: Cell id

<lac>: Location area code

<psc>: Primary synchronization code

5.29.3 Design Note

2G: The maxnum of cell info is 6

3G: The maxnum of cell info is 3

6. AT Commands –MT Control and Status Command

6.1 AT+CPAS – Phone activity status

6.1.1 Description

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

6.1.2 Format

Command	Possible response(s)
+CPAS	+CPAS: <pas>
+CPAS=?	+CPAS: (list of supported<pas>s)+CME ERROR: <err>

6.1.3 Field

<pas>:

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

6.2 AT+CFUN – Set phone functionality

6.2.1 Description

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

AT+CFUN = 1, 1 or AT+CFUN=4,1 can reset the target.

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

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

6.2.2 Format

Command	Possible response(s)
+CFUN=<fun>[,<rst>]	OK/+CME ERROR: <err>
+CFUN=?	+CFUN: (list of supported <fun>s),(list of supported<rst>s) OK/+CME ERROR: <err>

6.2.3 Field

<fun>:

- 0 minimal functionality, turn off radio and SIM power.
- 1 full functionality
- 4 disable phone both transmit and receive RF circuits (supported only for module solution)

<rst>:

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

6.2.4 Note

AT+CFUN=1, 1 and AT+CFUN=4,1 have the same functionality as AT+EPON.

6.3 AT+CPIN – EnterPIN

6.3.1 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. Refer [1] 9.2 for possible <err> values. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM.

6.3.2 Format

Command	Possible response(s)
+CPIN=<pin>[,<newpin>]	+CME ERROR: <err>
+CPIN?	+CPIN: <code>
+CPIN=?	

6.3.3 Field

<pin>, <newpin>: string type values

<code> values reserved by the present document:

READY	MT is not pending for any password
SIM PIN	MT is waiting SIM PIN to be given
SIM PUK	MT is waiting SIM PUK to be given
PH-SIM PIN	MT is waiting phone to SIM card password to be given
PH-FSIM PIN	MT is waiting phone-to-very first SIM card password to be given
PH-FSIM PUK	MT is waiting phone-to-very first SIM card unblocking password to be given
SIM PIN2	MT is waiting SIM PIN2 to be given

SIM PUK2	MT is waiting SIM PUK2 to be given
PH-NET PIN	MT is waiting network personalization password to be given
PH-NET PUK	MT is waiting network personalization unblocking password to be given
PH-NETSUB PIN	MT is waiting network subset personalization password to be given
PH-NETSUBPUK	MT is waiting network subset personalization unblocking password to be given
PH-SPPIN	MT is waiting service provider personalization password to be given
PH-SPPUK	MT is waiting service provider personalization unblocking password to be given
PH-CORP PIN	MT is waiting corporate personalization password to be given
PH-CORP PUK	MT is waiting corporate personalization unblocking password to be given

6.4 AT+EPIN1 – Enter PIN1

6.4.1 Description

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

6.4.2 Format

Command	Possible response(s)
+EPIN1=<puk>,<new_pin>	+CME ERROR: <err>
+EPIN1?	+EPIN1: <code> +CME ERROR: <err>
+EPIN1=?	

6.4.3 Field

<puk>, <new_pin>: string type values

<code> values reserved by the present document:

READY MT is not pending for any password

SIM PIN MT is waiting SIM PIN to be given

SIM PUK MT is waiting SIM PUK to be given

SIM BLOCKED PIN and PUK are blocked

6.4.4 Usage Note

- Do not use this command during power on process. During power on process, use AT+CPIN to validate PUK.
- Since this proprietary command is intended for modem project or dual- SIM/mode project. We won't handle such MMI synchronization problem or perform extra error handling
- Only used AT+EPIN1 when SIM card inserted

6.5 AT+EPIN2 – EnterPIN2

6.5.1 Description

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

6.5.2 Format

Command	Possible response(s)
+EPIN2=<pin2>or+EPIN2= <puk2>,<newpin2>	+CME ERROR: <err>
+EPIN2 ?	+EPIN2: <code>+CME ERROR: <err>
+EPIN2=?	

6.5.3 Field

<pin2>, <newpin2>, <puk2>: string type values

<code> values reserved by the present document:

READY PIN2 is allowed to verified

SIM PUK2 PIN2 is blocked

6.5.4 Usage Note

- For feature phone project, MMI will not sync with AT+EPIN2 operation. Ex: AT+EPIN2 to input PUK code fail, the remaining count in MMI might not decrease. Since this proprietary command is intended for modem project or dual-SIM/mode project. We won't handle such MMI synchronization problem.
- To verify PIN2, suggest to use `AT+CPWD="P2","PIN2","PIN2"`.
- To unblock PIN2, use `AT+EPIN2="PUK2","new_PIN2"`
- Only used AT+EPIN2 when SIM card inserted and MT has completely bootup

6.6 AT+EPINC – PIN remaining attempt number

6.6.1 Description

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

6.6.2 Format

Command	Possible response(s)
+EPINC	+EPINC: <pin1>,<pin2>,<puk1>,<puk2> +CME ERROR: <err>
+EPINC ?	+EPINC: <pin1>,<pin2>,<puk1>,<puk2> +CME ERROR: <err>
+EPINC=?	

6.6.3 Field

<pin1>, <pin2>,<puk1>,<puk2> are the remaining tries of each type.

6.7 AT+CICCID or AT+CCID – Read ICCID of SIM card

6.7.1 Description

This command is used to read SIM card ICCID if SIM inserted. If SIM not inserted, return

+CME ERROR: 10

6.7.2 Format

Command	Possible response(s)
+CICCID	<iccid>OK ERROR/ +CME ERROR:10

6.7.3 Field

<iccid>: string type

6.8 AT+ESIMS – Check SIM status

6.8.1 Description

The read command is only response the SIM inserted status.

The active command is used to trigger SIM reset procedure and response the SIM inserted status.

The execute command is used to enable/disable +ESIMS URC report.

6.8.2 Format

Command	Possible response(s)
AT+ESIMS?	+ESIMS: <SIM_INSERTED> OK
AT+ESIMS	+ESIMS: <SIM_INSERTED> OK
AT+ESIMS=<mode>	OK

6.8.3 Field

Type	Short Name	Parameter/comment	
Integer	SIM_INSERTED	0	No SIM
		1	Detected
Integer	mode	0	Disable +ESIMS URC
		1	Enable +ESIMS URC

6.9 AT+CSQ – Signal quality

6.9.1 Description

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

6.9.2 Format

Command	Possible response(s)
+CSQ	+CSQ: <rss>,<ber> +CME ERROR: <err>
+CSQ=?	+CSQ: (list of supported <rss>s),(list of supported<ber>s)

6.9.3 Field

<rss>:

0	113 dBm or less
1	111 dBm
2...30	109...53 dBm
31	51 dBm or greater

<ber> (in percent):

0..7 as RXQUAL values in the table in TS45.008 [20] subclause 8.2.4 not known or not detectable

6.10 AT+CMEC – Mobile termination control mode

6.10.1 Description

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

6.10.2 Format

Command	Possible response(s)
+CMEC=<keyp>[,<disp>[,<ind>]]	+CME ERROR: <err>
+CMEC?	+CMEC: <keyp>,<disp>,<ind>
+CMEC=?	+CMEC: (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s)

6.10.3 Field

<keyp>:

0 MT can be operated only through its keypad (execute command of +CKPD cannot be used)

1 MT can be operated only from TE (with command+CKPD)(not support)

2 MT can be operated from both MT keypad and TE

<disp>:

0 only MT can write to its display (command +CDIS can only be used to read the display)

1 only TE can write to MT display (with command+CDIS) (not support)

2 MT display can be written by both MT andTE(not support)

<ind>:

0 only MT can set the status of its indicators (command +CIND can only be used to read the indicators)

3 only TE can set the status of MT indicators (with command+CIND) (not support)

4 MT indicators can be set by both MT andTE(not support)

6.11 AT+CIND – Indicator control

6.11.1 Description

Display the value of ME indicators.

6.11.2 Format

Command	Possible response(s)
+CIND?	+CIND: <ind> [,<ind>[,...]] +CME ERROR: <err>
+CIND=?	+CIND: (<descr>, (list of supported<ind>s)) [,(<descr>, (list of supported <ind>s))][,...]] +CME ERROR: <err>

6.11.3 Field

<ind>: integer type value, which shall be in range of corresponding <descr>

<descr> values reserved by the present document and their <ind> ranges:

descr	description	<ind> value
battchg	battery charge level (0-5)	1

signal	signal quality (0-5)	2
service	service availability (0-1)	3
message	message received (0-1)	4
call	call in progress (0-1)	5
roam	roaming indicator (0-1)	6
smsfull	short message memory storage status (refer to +CIEV)	7

6.12 AT+CMER – Mobile termination event reporting

6.12.1 Description

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes. Test command returns the modes supported as compound values.

6.12.2 Format

Command	Possible response(s)
+CMER=<mode> [,<key>[,<disp>[,<in d>[,<bfr>]]]]	+CME ERROR: <err>
+CMER?	+CMER: <mode>,<key>,<disp>,<ind>,
+CMER=?	+CMER: (list of supported<mode>s),(list of supported<key>s) ,(list of supported <disp>s),(list of supported <ind>s) ,(list of supported <bfr>s)

6.12.3 Field

<mode>: integer type

- 0 buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded
- 1 discard unsolicited result codes when TA-TE link is reserved (e.g.in on-line data mode); otherwise forward them directly to theTE
- 2 buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. inon- line data mode) and flush them to the TE after reservation;otherwise forward the mdirectly to theTE
- 3 forward unsolicited result codes directly to the TE; TA-TE link specific in band technique used to embe result coses and data when TA is in on-line data mode

<keyp>: integer type

- 0 no keypad event reporting
- 1 keypad event reporting using result code +CKEV: <key>,<press>,<key> indicates the key (refer IRA values defined in table in subclause “Keypad control +CKPD”) and <press> if the keys pressed or released (1for pressing and 0 for releasing).Only those key pressing,which are not caused by +CKPD shall be indicated by theTA to theTE.

NOTE 1: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

- 2 Keypad event reporting using result code +CKEV: <key>, <press>.All key pressings shall be directed from TA toTE.
- 3 NOTE 2: When this mode is enabled, corresponding result codes of all keys currently pressed should be flushed to the TA regardless of <bfr> setting.

<disp>: integer type

- 2. no display event reporting

<ind>: integer type

- 0 no indicator event reporting

1 indicator event reporting using result code +CIEV: <ind>,<value>.<ind> indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to TE

2 indicator event reporting using result code +CIEV:<ind>, <value>. All indicator events shall be directed from TA to TE

<bfr>:

0 TA buffer of unsolicited result codes defined within this command is cleared when <mode>1...3 is entered

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

<action>, <x>, <y>. The <x>,<y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), and <action> indicates the action performed on the screen (0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE.

NOTE3: When this mode is enabled, corresponding result codes of all touch screen actions should be flushed to the TA regardless of <bfr> setting.

2 touch screen event reporting using result code +CTEV:<action>,<x>, <y>. All touch screen events shall be directed from the TA to the TE.

NOTE4: When this mode is enabled, corresponding result code so fall touch screen actions should be flushed to the TA regardless of <bfr> setting.

3 Verbose mode. Touch screen event reporting using +CTEV:<action>, <x>,<y>. This is a special mode where intermediate depressed result codes (+CTEV:<x>, <y>,depressed) are generated for each new <x>,<y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE.

NOTE5: When this mode is enabled, corresponding result code so fall touch screen actions should be flushed to the TA regardless of <bfr> setting.

6.12.4 Note

We don't support set command of +CIND to set the values of MT indicators. So behaviors of <ind> 1 and 2 are currently the same.

The +CKEV URC which set by <keyp> parameter only reports when UART setting is SIM1.

6.13 AT+CPBS – Select phonebook memory storage

6.13.1 Description

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

6.13.2 Format

Command	Possible response(s)
+CPBS=<storage>	+CME ERROR: <err>
+CPBS?	+CPBS:<storage>[,<used>,<total>] +CME ERROR: <err>
+CPBS=?	+CPBS: (list of supported<storage>s)

6.13.3 Field

"ME"	MT phonebook
"SM"	SIM/UICC phonebook
"LD"	last-dialling phonebook
"MC"	MT missed calls list
"RC"	MT received calls list.
"FD"	SIM/USIM fix dialling-phonebook
"DC"	MT dialled calls list
"ON"	SIM own numbers (MSISDNs) list

6.14 AT+CPBR or AT+ECPBR – Read phonebook sentries

6.14.1 Description

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

6.14.2 Format

Command	Possible response(s)
+CPBR=<index1> [,<index2>]	[+CPBR:<index1>,<number>,<type>,<text> [[...] <CR><LF>+CPBR:<index2>,<number>,<type>,<text>]] +CME ERROR: <err>
+ECPBR=<index1> [,<index2>]	[+ECPBR:<index1>,<number>,<type>,<secondnumber>,<type>,<thirdnumber>,<type>,<fourthnumber>,<type>,<text>,<codingscheme>,<SNE>,<codingscheme>,<Email> [[...] <CR><LF>+ECPBR: <index2>,<number>,<type>,<secondnumber>,<type>,<thirdnumber>,<type>,<fourthnumber>,<type>,<text>,<codingscheme>,<SNE>,<codingscheme>,<Email>]] +CME ERROR: <err>
+CPBR=?	+CPBR: (list of supported <index>s),[<nlength>],[<tlength>]

+ECPBR=?	+ECPBR: (list of supported <index>s),[<nlength>],[<tlength>],[<second tlength>],[<email length>] +CME ERROR: <err>
----------	--

6.14.3 Field

<index1>, <index2>, <index>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address octet in integer format (refer TS 24.008 [8] subclause 10.5.4.7)

<text>: string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS

<nlength>: integer type value indicating the maximum length of field <number>

<tlength>: integer type value indicating the maximum length of field <text>

<SNE>: second name entry (refer to TS 31.102)

<Email>: e-mail address (refer to TS 31.102)

6.15 AT+CPBF – Find phonebook entries

6.15.1 Description

Execution command returns phonebook entries (from SM and ME) which alphanumeric field start with string <findtext> (Prefix match). Entry fields returned are location number <index*n*>, phone number stored there <number> (of format <type>) and text <text> associated with the number.

6.15.2 Format

Command	Possible response(s)
---------	----------------------

+CPBF=<findtext>	[+CPBF:<index1>,<number>,<type>,<text> [...] <CR><LF>+CBPF: <index2>,<number>,<type>,<text>]] +CME ERROR: <err>
+CPBF=?	+CPBF:[<nlength>],[<tlength>] +CME ERROR: <err>

6.15.3 Field

<index1>, <index2>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address octet in integer format

<findtext>, <text>: string type field of maximum length <tlength>. Only support "IRA"

<nlength>: integer type value indicating the maximum length of field<number>

<tlength>: integer type value indicating the maximum length of field <text>

6.16 AT+CPBW – Write phonebook entries

6.16.1 Description

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

6.16.2 Format

Command	Possible response(s)
---------	----------------------

+CPBW=<index>[[,<number>[,<type>[,<text>][,<time>]]] +ECPBW=<index>,<number>,<type>,<text>,<coding scheme>,<second text>,<coding scheme>,<email>	+CME ERROR: <err>
+CPBW=?	+CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s),[<tlength>] +CME ERROR:

6.16.3 Field

<index>: integer type values in the range of location numbers of phonebook memory

<number>: string type phone number of format <type>

<type>: type of address

<text>: string type field of maximum length <tlength>; character set as specified by command Select TE Character Set+CSCS. "UCS2" , and "IRA" are supported.

<nlength>: integer type value indicating the maximum length of field<number>

<tlength>: integer type value indicating the maximum bytes of field <text> after encoding

6.16.4 Note

1. The returned value <tlength> of AT+CPBW=? indicates the maximum bytes of field<text> after encoding. So when AT+CPBW use UCS2 coding scheme to store the field <text> of the entry, users should notice that the maximum length of <text> is <tlength>/2 because of UCS2 encoding (1 character use 2 byte).

2. +EPBW is similar to +CPBW but not used currently.

6.17 AT+ESLN – Sync last number

6.17.1 Description

This command is used to sync call log from NVRAM back to SIM card.

6.17.2 Format

Command	Possible response(s)
+ESLN=?	
+ESLN	+CME ERROR: <err>

6.17.3 Field

None

6.17.4 Note

1. We only support this command in the modem load project.
2. Currently, it is used to sync the call log when closing the data card tool in the data card project.

6.18 AT+EPBUM – USIM Phonebook manager

6.18.1 Description

This command is used to query/read/write/delete USIM Phonebook related files: EF_ANR, EF_SNE, EF_EMAIL, EF_AAS, EF_GAS, EF_GRP

6.18.2 Format

Command	Possible response(s)
---------	----------------------

+EPBUM=<op> ,<type> ,<INDEX1> [<INDEX2> [<number/email/text/ grp_list>]]	<op> = 0 (QUERY) <type>=0 (EF_ANR) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_ANR> <type>=1 (EF_EMAIL) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_EMAIL> <type>=2 (EF_SNE) +EPBUM: <type>, <INDEX1>, <M_NUM>, <A_NUM>, <L_SNE> <op> = 1 (READ) +EPBUM:<type>,<INDEX1>,<INDEX2>,<number/email/text/grp_list> +CME ERROR: <err>
+EPBUM=?	+EPBUM: <N_ANR>,<N_EMAIL>,<N_SNE>,<N_AAS>,<L_AAS>,<N_GAS>,<L_GAS>,< N_GRP> +CME ERROR: <err>

6.18.3 Field

<op>:

0: query EF files information. In this <op>, the valid types are EF_ANR, EF_SNE, and EF_EMAIL

1: read EF files

2: write EF files

3: delete EF files

<type>: the type of USIM phonebook related EF files

0: EF_ANR

1: EF_EMAIL

2: EF_SNE

3: EF_AAS

4: EF_GAS

5:EF_GRP

<M_NUM>: max number of entries in the queried EF files

<A_NUM>: max number of available entries in the queried EF files

<L_ANR>: max supported number length of an entry in the queried EF_ANR file

<L_EMAIL>: max supported email length of an entry in the queried EF_EMAIL file

<L_SNE>: max supported second name length of an entry in the queried EF_SNE file

<INDEX1>, <INDEX2>: has different meaning according to the <op> and <type>

<op>=0 (Query) : only <INDEX1> is needed

<INDEX1> : Assume <index1> is N, N-th EF file associated with an EF_ADN

<op>=1 or 2 or 3: (Read/Write/Delete)

<type>=0 or 1 or 2 (EF_ANR/EF_EMAIL/EF_SNE)

<INDEX1>: the index of ADN entry to be accessed

<INDEX2>: Assume <INDEX2> is N, N-th EF entry associated with the ADN entry

<type>=3 or 4 (EF_AAS or EF_GAS)

<INDEX1>: the index of EF entry to be accessed

<INDEX2>: ignore

<type>=5 (EF_GRP)

<INDEX1>: the index of EF GRP associated with the ADN entry to be accessed

<INDEX2>: ignore

<number/email/text/grp_list>: the format is different according to the<type>

<type>=0 (EF_ANR)

<number>, <ton>, <ass_id>

<number>: the telephony number

<ton>: the type of <number>, valid value: 129(normal) or 145(international)

<aas_id>: the associated EF_AAS entry index

<type>=1 (EF_EMAIL)

<email> : the email, must be IRA encode

<type>=2 or 3 or 4(EF_SNE/EF_AAS/EF_GAS)

<text>, <encode>

<text>: the alpha string, the encoding is according to the<encode>

<encode>:

0: IRA

1: UCS2 0x80

2: UCS2 0x81

<type>=5 (EF_GRP)

<GRP1>, <GRP2>, ..., <GRP_n>

The valid value of each <GRPx> is 0 ~ 255, n is <N_GRP>

<N_ANR>: maximum number of entries associated with an EF_ADN

<N_EMAIL>: maximum number of entries associated with an EF_EMAIL

<N_SNE>: maximum number of entries associated with an EF_SNE

<N_AAS>: maximum number of entries in the EF_AAS

<L_AAS>: maximum alpha string length of an EF_AAS entry

<N_GAS>: maximum number of entries in the EF_GAS

<L_GAS>: maximum alpha string length of an EF_GAS entry

<N_GRP>: maximum number of groups in an entry of EF_GRP

6.19 AT+CRSM – Restricted SIM access

6.19.1 Description

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

6.19.2 Format

Command	Possible response(s)
+CRSM=<command>[,<fileid> [,<P1>,<P2>,<P3> [,<data>[,<pathid>]]]]	+CRSM: <sw1>,<sw2>[,<response>] +CME ERROR: <err>
+CRSM=?	

6.19.3 Field

<command> (command passed on by the MT to the SIM; refer 3GPPTS11.11):

176 READ BINARY

178 READ RECORD

192 GET RESPONSE

214 UPDATE BINARY

220 UPDATE RECORD

242 STATUS

<fileid>: integer type; this is the identifier of a elementary data file on SIM.

<P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the SIM.(For detailed

information, please refer 3GPPTS11.11 Section 9.2)

<data>: information which shall be written to the SIM (hexadecimal character format; refer +CSCS)

<pathid>: string type; contains the path of an elementary file on the SIM/UICC in hexadecimal format as

defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102221 [60].

NOTE: Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the <pathid> indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if <pathid> is omitted, it could be implementation specific which one will be selected.

<sw1>, <sw2>: integer type; information from the SIM about the execution of the actual command.

<response>: response of a successful completion of the command previously issued (hexadecimal character format)

[Note1]: READ BINARY command is used for transparent EF. READ RECORD is used for linear fixed or cyclic EF

[Note2]: Before using READ BINARY, READ RECORD, UPDATE BINARY, UPDATE RECORD, please use command GET RESPONSE to get the exact length information first.

6.19.4 Note

- <pathid> + <fileid> can be a unique identifier on the SIM/UICC.
- In USIM, the response of STATUS and GET RESPONSE is TLV format, and length is not fixed. So the P3 should be assigned as "00" as 256 bytes, which is the maximum value of response data.

6.19.5 Example

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

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

at+crsm=192,28472

+CRSM: 144, 0, "0000000A6F38040015005501010000" OK at+crsm=176,28472,0,0,10

+CRSM: 144, 0, "FF3FFFFFF00003C03000C"

OK

Read a EFADN (file_idx= 0x6F3A , structure: Linearfixed)

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

at+crsm=192,28474

+CRSM: 144, 0, "00001D4C6F3A04001100220502011E" OK

(2) READ RECORD at+crsm=178,2 8474,1,4,30

+CRSM: 144, 0, "6F776E6572FFFFFFFFFFFFFFFFFFFFFFFF06819078303326FFFFFFFFFFFFFFFF"

OK

2. READ EFImage InstanceDataFiles (with <pathid>) (file_idx = 0x4F20(File id would be different if you use other SIM cards), structure:Transparent)

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

(2) READ BINARY

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

+CRSM: 144, 0,"00"

OK

6.20 AT+CACM – Accumulated call meter

6.20.1 Description

Resets the Advice-of-Charge related accumulated call meter value in the SIM file EFACM.

6.20.2 Format

Command	Possible response(s)
+CACM=[<passwd>]	+CME ERROR: <err>

+CACM?	+CACM: <acm> +CME ERROR: <err>
+CACM=?	

6.20.3 Field

<passwd>: string type; SIM PIN2

<acm>: string type; accumulated call meter value similarly coded as <ccm> under+CAOC

6.21 AT+CAMM – Accumulated call meter maximum

6.21.1 Description

Sets the maximum Advice-of-Charge related accumulated call meter value in the SIMfile EFACMmax.

6.21.2 Format

Command	Possible response(s)
+CAMM=[<acmmax>[,<passwd>]]	+CME ERROR: <err>
+CAMM?	+CAMM: <acmmax> +CME ERROR: <err>
+CAMM=?	

6.21.3 Field

<acmmax>: string type;

accumulated call meter maximum value similarly coded as <ccm> under+CAOC; value zero disables ACMmax feature

<passwd>: string type; SIM PIN2

6.22 AT+CCWE – Call meter maximum event

6.22.1 Description

Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30s call time remains.

6.22.2 Format

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

6.22.3 Field

<mode>:

- 0 Disable the call meter warning event
- 1 Enable the call meter warning event

6.23 AT+CTZR – Time Zone reporting

6.23.1 Description

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

6.23.2 Format

Command	Possible response(s)
---------	----------------------

+CTZR=<onoff>	+CME ERROR: <err>
+CTZR?	+CTZR: <onoff>
+CTZR=?	+CTZR: (list of supported <onoff>s)

6.23.3 Field

<onoff>: integer type value indicating:

- 0 – Disable automatic time zone update via NITZ (default).
- 1 – Enable automatic time zone update via NITZ.

7. AT Commands – GPRS

Commands

7.1 AT+CGDCONT – Define PDPcontext

7.1.1 Description

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

7.1.2 Format

Command	Possible response(s)
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>]]]]]][,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]	OK ERROR
+CGDCONT?	[+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]] [...]

+CGDCONT=?	<pre> +CGDCONT:(range of supported <cid>s),<PDP_type>,...(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P- CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,...(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P- CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s) [...]] </pre>
------------	---

7.1.3 Field

<cid>:

(PDP Context Identifier) a numeric parameter which specifies a particular PDPcontext definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) astring parameter.

IP Internet Protocol (IETF STD5)

IPV6 Internet Protocol, version 6 (see RFC 2460)

IPV4V6 virtual <PDP_type> introduced to handle dual IP stack UE capability

(see the 3GPP TS 24.301)

<APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.

If the value is null or omitted, then the subscription value will be requested.

<PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP.

If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested.

The read form of the command will continue to return the null string even

if an address has been allocated during the PDP start up procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>: a numeric parameter that controls PDP data compression (applicable for SNDCP only)

0 - off (default if value is omitted)

<h_comp>: a numeric parameter that controls PDP header compression 0 - off (default if value is omitted)

<IPv4AddrAlloc>: a numeric parameter that controls how the MT/TA requests to get the IPv4 address information

0 IPv4 Address Allocation through NASS signalling

1 IPv4 Address Allocated through DHCP

<request_type>: integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for hand over is implementation specific)

0 PDP context is for emergency bearer services

- 1 PDP context is for new PDP context establishment
- 2 PDP context is for handover from a non-3GPP access network

<P-CSCF_discovery>: a numeric parameter influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.

- 0 Preference of P-CSCF address discovery not influenced by +CGDCONT
- 1 Preference of P-CSCF address discovery through NAS Signalling
- 2 Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind>: a numeric parameter used to indicate to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

- 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only
- 1 UE indicates that the PDP context is for IM CN subsystem- related signaling only

Note: In our design, except cid 0, user must use AT+CGDCONT=<cid>,... to specify PDP context parameter values before using AT+CGACT=1,<cid> to activate the PDP context.

7.2 AT+CGDSCONT – Define secondary PDP context

7.2.1 Description

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

7.2.2 Format

Command	Possible response(s)
+CGDSCONT=[<cid>,<p_cid>[,<d_comp>[,<h_comp>[,<IM_CN_Signalling_Flag_Ind>]]]]	OK or ERROR

+CGDSCONT?	+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind> [<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind>[...]]
+CGDSCONT=?	+CGDSCONT: (range of supported <cid>s) ,(list of <p_cid>s for active primary contexts) ,(list of supported <d_comp>s) ,(list of supported <h_comp>s) ,(list of supported <IM_CN_Signalling_Flag_Ind>s)

7.2.3 Field

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<p_cid>: (Primary PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP Internet Protocol (IETF STD5)

<d_comp>: a numeric parameter that controls PDP data compression

0 – off (default if value is omitted)

<h_comp>: a numeric parameter that controls PDP header compression

0 - off (default if value is omitted)

<IM_CN_Signalling_Flag_Ind>: a numeric parameter used to indicate to the network whether the

PDP context is for IM CN subsystem-related signalling only or not.

0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only 1 UE

indicates that the PDP context is for IM CN subsystem-related signaling only

7.3 AT+CGQREQ – Quality of service profile (Requested)

7.3.1 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.

7.3.2 Format

Command	Possible Response(s)
+CGQREQ=[<cid>[,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK or ERROR
+CGQREQ?	+CGQREQ:<cid>,<precedence>,<delay>,<reliability> ,<peak>,<mean> [<CR><LF>+CGQREQ:<cid>,<precedence > ,<delay>,<reliability.>, <peak>,<mean> [...]]

+CGQREQ=?	<pre> +CGQREQ: <PDP_type> ,(listof supported <precedence>s) ,(list of supported <delay>s) ,(listof supported <reliability>s) ,(list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ:<PDP_type> ,(list of supported<precedence>s) ,(list of supported <delay>s) ,(list of supported <reliability>s) ,(list of supported <peak>s) ,(list of supported <mean>s) [...]] </pre>
-----------	--

7.3.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition

<precedence>: a numeric parameter which specifies the precedence class

<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class

<peak>: a numeric parameter which specifies the peak through put class

<mean>: a numeric parameter which specifies the mean through put class

7.4 AT+CGQMIN – Quality of service profile

7.4.1 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.

7.4.2 Format

Command	Possible Response(s)
+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK or ERROR
+CGQMIN?	+CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]]
+CGQMIN=?	+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN:<PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [...]]

7.4.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition

<precedence>: a numeric parameter which specifies the precedence class

<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class

<peak>: a numeric parameter which specifies the peak through put class

<mean>: a numeric parameter which specifies the mean through put class

7.5 AT+CGATT – PS Attach or detach

7.5.1 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.

7.5.2 Format

Command	Possible Response(s)
+CGATT= [<state>]	OK ERROR
+CGATT?	+CGATT: <state>
+CGATT=?	+CGATT: (list of supported<state>s)

7.5.3 Field

<state>: indicates the state of PS attachment

0 - detached

1 - attached

7.6 AT+CGACT – PDP Context activate or deactivate

7.6.1 Description

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

7.6.2 Format

Command	Possible Response(s)
+CGACT=[<state> [,<cid>]]	+CGEV: ME PDN ACT<cid> OK or ERROR +CME: ERROR <cause>

+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
+CGACT=?	+CGACT: (list of supported<state>s)

7.6.3 Field

<state>: indicates the state of PDP context activation

0 - deactivated

1 - activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition. If no

<cid> is specified, then UE assumes it as 1. The usage of omitted <cid> to activate/deactivate all is not supported.

<cause>: indicate the PDP context activation failure cause, including:

SM reject cause = 3072 + <sm cause>

Which <sm cause> is specified at 3GPP 24.008 clause 10.5.6.6(Annex I)

TCM reject cause = 3372 + <tcm cause>

Which <tcm cause> is a enum specified as:

TCM_L4C_INVALID_PARAMETER = 0x00 +TCM_CAUSE_START,

TCM_L4C_NSAPI_NOT_IN_USE,

TCM_L4C_CID_ALREADY_IN_USE,

TCM_L4C_CID_UNEXPECTED,

TCM_L4C_CID_PRIMARY_IS_NOT_ACTIVATED,

TCM_ACL_ACTION_NOT_ALLOWED,

TCM_ACL_SIM_FILE_FULL,

TCM_ACL_ADD_ENTRY_FAILED,

TCM_ACL_DEL_ENTRY_FAILED,

TCM_ACL_SET_ENTRY_FAILED,
 TCM_ACL_SIM_READ_FAILED,
 TCM_ACL_SIM_WRITE_FAILED,
 L4C_CMD_CONFLICT = 3472

Note: In our design, except cid 0, user must use AT+CGDCONT=<cid>,... to specify PDP context parameter values before using AT+CGACT=1, <cid> to activate the PDP context.

7.7 AT+CGPADDR – Show PDP address

7.7.1 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.

7.7.2 Format

Command	Possible response(s)
+CGPADDR=<cid>	+CGPADDR: <cid>,<PDP_addr>
+CGPADDR=?	+CGPADDR: (list of defined<cid>s)

7.7.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition (see the+CGDCONT and+CGDSCONT commands). If no <cid> is specified, an ERROR result code will be returned. Multiple <cid> field is not supported.

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>.

<PDP_address> is omitted if none is available.

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

7.8.1 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.

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

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

7.8.2 Format

Command	Possible response(s)
+CGAUTO=<n>	OK ERROR
+CGAUTO?	+CGAUTO: <n>

7.8.3 Field

<n>:

0 turn off automatic response for Packet Domain only

1 turn on automatic response for Packet Domain only

For <n> = 0 Packet Domain network requests are manually accepted or rejected by the +CGANS command.

For <n> = 1 Packet Domain network requests are automatically accepted according to the

description above.

7.9 AT+CGEREP – Packet domain event reporting

7.9.1 Description

Set command enables or disables sending of unsolicited result codes(URC),

+CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network.

7.9.2 Format

Command	Possible response(s)
+CGEREP=<mode>	OK
+CGEREP?	+CGEREP: <mode>
+CGEREP=?	+CGEREP:(list of supported <mode>s)

7.9.3 Field

<mode>: a numeric parameter

- 0 Disables sending of URC, +CGEV.No codes are forwarded to the TE.
- 1 Eables sending of URC, +CGEV.forward the mdirectly to theTE.

For network attachment, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

- +CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all activecontexts have been deactivated. These are not reported separately.

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

- `+CGEV: NW PDN ACT<cid>`

The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The `<cid>` for this context is provided to the TE. The format of the parameter `<cid>` is found in command `+CGDCONT`.

NOTE1: This event is not applicable for EPS.

- `+CGEV: ME PDN ACT<cid>[,<reason>]`

The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The `<cid>` for this context is provided to the TE. This event is sent either in result of explicit context activation request (`+CGACT`), or in result of implicit context activation request associated to attach request (`+CGATT=1`). The format of the parameters `<cid>` and `<cid_other>` are found in command

`+CGDCONT`.

`<reason>`: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with `<cid>` is IPv4v6, and the PDP type assigned by the network for `<cid>` is either IPv4 or IPv6.

0 IPv4 only allowed

1 IPv6 only allowed

2 Single address bearers only allowed. single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.

- `+CGEV: NW ACT <p_cid>, <cid>, <event_type>`

The network has activated a context. The `<cid>` for this context is provided to the TE in addition to the associated primary `<p_cid>`. The format of the parameters `<p_cid>` and `<cid>` are found in command `+CGDSCONT`.

`<event_type>`: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.

0 Informational event

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

- +CGEV: ME ACT <p_cid>, <cid>, <event_type>

The network has responded to an ME initiated context activation. The

<cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

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

- +CGEV: NW PDN DEACT<cid>

The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated

<cid> for this context is provided to the TE. The format of the parameter

<cid> is found in command +CGDCONT.

- +CGEV: ME PDN DEACT<cid>

The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

- +CGEV: NW DEACT <p_cid>, <cid>, <event_type>

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

- +CGEV: ME DEACT <p_cid>, <cid>, <event_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

For PDP context modification, the following unsolicited result codes and the corresponding events

are defined:

- +CGEV: NW MODIFY <cid>, <change_reason>, <event_type>

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters

<change_reason> and <event_type> are defined above.

<change_reason>: integer type; indicates what kind of change occurred.

- 1 TFT only changed
- 2 Qos only changed
- 3 Both TFT and QoS changed

- +CGEV: ME MODIFY <cid>, <change_reason>, <event_type>

The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason> and <event_type> are defined above.

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

- +CGEV: REJECT <PDP_type>, <PDP_addr>

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

NOTE6: This event is not applicable for EPS.

- +CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

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

NOTE7: This event is not applicable for EPS.

7.10 AT+CGREG – GPRS Network registration status

7.10.1 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. The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat> changes.

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. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3.

7.10.2 Format

Command	Possible response(s)
+CGREG=[<n>]	
+CGREG?	+CGREG: <n>, <stat>[, [<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]]

7.10.3 Field

<n>:

- | | |
|---|---|
| 0 | Disable network registration unsolicited result code |
| 1 | enable network registration unsolicited result code +CGREG:<stat> |
| 2 | enable network registration and location information unsolicited result code
+CGREG: <stat>[, <[lac>,<[ci>],[<AcT>],[<rac>]] |
| 3 | enable network registration, location information and GMM cause value information unsolicited result code |

+CGREG:<stat>[,<lac>],[<ci>],[<AcT>],[<rac>][,<cause_type>,<reject_cause>]]

<stat>:

- 0 not registered, MT is not currently searching an operator to register to
- 1 registered, home network
- 2 not registered, but MT is currently trying to attach or searching an operator to register to
- 3 registration denied
- 4 unknown
- 5 registered,roaming
- 6 registered for "SMS only", home network (not applicable)
- 7 registered for "SMS only", roaming (not applicable)
- 8 attached for emergency bearer services only (see NOTE 2) (applicable only when <AcT> indicates 2,4,5,6)
- 9 registered for "CSFB not preferred", home network (not applicable)
- 10 registered for "CSFB not preferred", roaming (not applicable)

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; four byte cell ID in hexadecimal format

<AcT>:

- 0 GSM
- 2 UTRAN
- 3 GSMw/EGPRS
- 4 UTRANw/HSDPA
- 5 UTRANw/HSUPA

6 UTRAN w/HSDPA andHSUPA

7 E-UTRAN (notapplicable)

<rac>: string type; one byte routing area code in hexadecimal format

<cause_type>: integer type; indicates the type of <reject_cause>.

0 Indicates that <reject_cause> contains a GMM cause value, see 3GPP TS 24.008 [8] AnnexG.

1 Indicates that <reject_cause> contains amanufacturer-specific cause.

<reject_cause>: integer type; contains the cause of the failed registration.The value is of type as defined by <cause_type>.

7.11 AT+CGSMS – Select service for MO SMS messages

7.11.1 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.

7.11.2 Format

Command	Possible Response(s)
+CGSMS= <service>	OK ERROR
+CGSMS?	+CGSMS: <service>

7.11.3 Field

<service>: a numeric parameter which indicates the service or service preference to be used

0 Packet Domain

- 1 Circuit switched
- 2 Packet Domain preferred (use circuit switched if GPRS not available)
- 3 Circuit switched preferred (use Packet Domain if circuit switched not available)

7.12 AT+EGTP – GPRS Transfer preference

7.12.1 Description

This command is to set or to get GPRS transfer preference.

7.12.2 Format

Command	Possible Response(s)
+EGTP=<state>	OK or ERROR
+EGTP?	+EGTP: <state>
+EGTP=?	+EGTP: (list of supported)

7.12.3 Field

<state>: indicates the state of GPRS transfer preference

- 0 – DATA PREFER
- 1 – CALL PREFER

Other values are reserved and will result in an ERROR response to the execution command.

7.13 AT+CGEQREQ – 3G Quality of service profile

7.13.1 Description

This command allows the TE to specify a UMTS QoS Profile that is used when the MT sends and Activate PDP Context Request message to the network.

7.13.2 Format

+CGEQREQ=?

+CGEQREQ: <PDP_type>, (list of supported <Trafficclass>s)
,(list of supported <Maximum bitrate UL>s), (listof supported
<Maximum bitrate DL>s),

7.13.3 Field

<cid>: (see +CGDCONT and _CGDSCONT commands) A special form of the set command, +CGEQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

<Traffic class>: a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

- 0 - conversational
- 1 - streaming
- 2 - interactive
- 3 - background
- 4 - subscribed value

Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.AT+CGEQREQ=...,32, ...).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an

example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=...,32, ...). If the parameter is set to '0' the subscribed value will be requested.

<Delivery order>: a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

- 0 -no
- 1 -yes
- 2 -subscribed value.

Other values are reserved.

<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. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$

would be specified as '5E3' (e.g. AT+CGEQREQ=..., '5E3', ...). '0E0' means subscribed value.

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQREQ=..., '5E3', ...). '0E0' means subscribed value.

<Delivery of erroneous SDUs>: a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.-no

- 0 -yes
- 1 – no detect
- 2 – subscribed value

Other values are reserved.

<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. If the parameter is set to '0' the subscribed value will be requested.

<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. If the parameter is set to '0' the subscribed value will be requested.

<PDP_type>: (see +CGDCONT and +CGDSCONT commands).

7.14 AT+CGEQMIN – 3G Quality of service profile (Minimum Acceptable)

7.14.1 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.

7.14.2 Format

Command	Possible Response(s)
+CGEQMIN=[<cid>[,<Traffic class> [,<Maximum bitrateUL> [,<Maximumbitrate DL> [,<Guaranteed bitrateUL> [,<Guaranteedbitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [[,<Residual bit errorratio> [,<Delivery oferroneous SDUs> [,<Transfer delay> [,<Traffic handlingpriority>]]]]]]]]]]]	OK or ERROR

+CGEQMIN?

```
+CGEQMIN: <cid>, <Trafficclass>,<Maximum bitrate UL>
,<Maximumbitrate DL>,<Guatanteed bitrate UL>
,<guaranteed bitrate DL>,<Delivery order>
,<Maximum SDU size>,<SDUerrorratio>
,<residual bit error radio>,<Deliver of erroneous SDUs>
,<Transfer delay>,<Traffic handling priority>
[<CR><LF>+CGEQMIN: <cid>,<TrafficClass>
,<Maximum bitrate DL>,<Guaranteedbitrate UL>
,<Guaranteed bitrate DL>,< Deliver order>
,<Maximum SDU size> ,<SDU errorratio>
,<Residual bit error ratio>,<Delivery of erroneous SDUs>
,<Transfer delay> ,<Traffic handling priority> [...]]
```

	<pre>+CGEQMIN:<PDP type> , (list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s) ,(list of supported <Maximum bitrate DL>s) ,(list of supported <Guaranteed bitrate UL>s) ,(list of supported <Delivery order>s), (list of supported<Maximum SDU size>s) ,(list of supported<Residual bit error ratio>s) ,(list of supported <Delivery of erroneous SDUs>s) ,(list of supported <Traffic handling priority>s) +CGEQMIN=? [<CR><LF>+CGEQMIN: <PDP_type> ,(list of supported <Traffic class>s) ,(list of supported <Maximum bitrate UL>s) , (list of supported <Maximum bitrate DL>s) ,(list of supported <Guaranteed bitrate UL>s) , (list of supported <Guaranteed bitrate DL>s) , (list of supported <Delivery order>s), (list of supported <Maximum SDU error ratio>s) ,(list of supported <Residual bit error ratio>s) , (list of supported <Delivery of erroneousSDUs>s) ,(list of supported <Traffic handling priority>s)[...]]</pre>
--	---

7.14.3 Field

<cid>: (see +CGDCONT and _CGDSCONT commands) A special form of the set command, +CGEQMIN=<cid> causes the requested profile for context number <cid> to become undefined.

<Traffic class>: a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

- 0 -conversational
- 1 -streaming
- 2 -interactive
- 3 -background

Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.

AT+CGEQMIN=...,32, ...).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g.AT+CGEQMIN=...,32, ...).

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32, ...).

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=...,32,...).

<Delivery order>: a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

- 0 -no
- 1 -yes

Other values are reserved.

<Maximum SDU size>: a numeric parameter (1,2,3,...) that indicates the maximum allowed SDU size in octets.

<SDU error ratio>: a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value

is specified as 'mEe'. As an example a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQMIN=..., '5E3',).

<Residual bit error ratio>: a string parameter that indicates the target value for the undetected bit

error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as '5E3' (e.g. AT+CGEQMIN=..., '5E3',).

<Delivery of erroneous SDUs>: a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

- 0 -no
- 1 -yes
- 2 -no detect

Other values are reserved.

<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.

<PDP_type>: (see +CGDCONT and +CGDSCONT commands).

7.15 AT+CGPRCO – GPRS Protocol configuration

7.15.1 Description

This command is used to for NDIS dialup set/get protocol related config options (PDP username, passwd, DNS, Authentication Type, request IPv6 DNS, ...). And these protocol configuration will be used in SM PDP context activation to negotiate with GGSN.

7.15.2 Format

Command	Possible response(s)
---------	----------------------

+CGPRCO=<cid>,<user_name>,<passwd>,<DNS1>,<DNS2>,<auth_type>,<req_v6_dns>,<req_v4_dns>	OK +CME ERROR: <err>
+CGPRCO=?	+CGPRCO: <list of cids>,<max user_name length>,<max passwd length>
+CGPRCO?	+CGPRCO:<cid>,<DNS1>,<DNS2>[,<V6_DNS1>,<V6_DNS2>][...]

7.15.3 Field

<cid>: a numeric parameter which specifies a particular PDP context definition.

<user_name>: string to specify "User Name"

<passwd>: string to specify "Password"

<DNS1>: string to specify "primary DNS"

<DNS2>: string to specify "secondary DNS"

<auth_type>: a numeric parameter used to indicate authentication type. Default is PAP.

0: PAP

1: CHAP

2: None

3: PAP+CHAP

<req_v6_dns>: a numeric parameter to indicate if request IPv6 DNS or not. Default is Yes.

0: No

1: Yes

<req_v4_dns>: a numeric parameter to indicate if request IPv6 DNS or not. Default is Yes.

0: No

1: Yes

7.16 AT+ACTTEST – PDP Context activate or deactivate from EM mode

7.16.1 Description

To activate or deactivate the specified PDP context (s) and get flow control buffer for +CGSDATA.

7.16.2 Format

Command	Possible Response(s)
+ACTTEST=<state> ,<ci d>	+CGEV:ME PDNACT 1 OK/ERROR
+ACTTEST=?	OK

7.16.3 Field

<state>: indicates the state of PDP context activation

0 -deactivated

1 -activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition

7.17 AT+PSBEARER – Packet switching data service capability

7.17.1 Designnote

Read command use to query packet switching data service capability. Set command use to enable or disable +PSBEARER URC.

7.17.2 Format

Command	Possible Response(s)
+PSBEARER=<mode>	OK

+PSBEARER?	+PSBEARER:<cell_data_speed_support>,<max_data_bearer_capability> OK
------------	--

7.17.3 Field

Type	Short name	Parameter/comment	
Integer	mode	0	Disable +PSBEARER URC
		1	Enable +PSBEARER URC

Integer	cell_data_speed_support	<p>Corresponding enumeration defined as bellow</p> <pre> Typedef enum{ L4C_NONE_SPECIFIED = 0x0000, L4C_GPRS_SUPPORT = 0x0001, L4C_EDGE_SUPPORT = 0x0002, L4C_UMTS_SUPPORT = 0x0004, L4C_HSDPA_SUPPORT = 0x0008, L4C_HSUPA_SUPPORT = 0x0010, L4C_HSDPA_UPA_SUPPORT = 0x0018, L4C_HSUPAP_SUPPORT = 0x0020, L4C_HSDPAP_SUPPORT = 0x0030, L4C_HSUPAP_SUPPORT = 0x0040, L4C_HSUPAP_DPA_SUPPORT = 0x0048, L4C_HSPAP_SUPPORT = 0x0060, L4C_DC_DPA_SUPPORT = 0x0088, L4C_DC_DPA_UPA_SUPPORT = 0x0098, L4C_DC_HSDPAP_SUPPORT = 0x00a0, L4C_DC_HSDPAP_UPA_SUPPORT = 0x00b0, L4C_DC_HSUPAP_DPA_SUPPORT = 0x00c8, L4C_LTE_SUPPORT = 0x1000, L4C_NOT_CHANGE = 0xffff } </pre>
---------	-------------------------	---

Integer	Max_data_bearer_capability	<p>Corresponding enumeration defined as bellow</p> <pre> Typedef enum{ L4C_NONE_ACTIVATE = 0, L4C_GPRS_CAPABILITY, L4C_EDGE_CAPABILITY, L4C_UMTS_CAPABILITY, L4C_HSDPA_CAPABILITY, //mac-hs L4C_HSUPA_CAPABILITY, //mac-e/es L4C_HSDPA_HSUPA_CAPABILITY, //mac-hs +mac-e/es L4C_HSDPAP_CAPABILITY, //mac-ehs L4C_HSDPAP_UPA_CAPABILITY, //mac-hs +mac-e/es L4C_HSUPAP_CAPABILITY, //mac-i/is L4C_HSUPAP_DPA_CAPABILITY, //mac-sh+mac-i/is L4C_HSPAP_CAPABILITY, //mac-ehs+mac-i/is L4C_DC_DPA_CAPABILITY, // (DC) mac-hs L4C_DC_DPA_UPA_CAPABILITY, // (DC) mac-hs+mac-e/es L4C_DC_HSDPAP_CAPABILITY, // (DC) mac-ehs L4C_DC_HSDPAP_UPA_CAPABILITY, // (DC) mac-ehs+mac-e/es L4C_DC_HSUPAP_DPA_CAPABILITY, // (DC) mac-hs+mac-i/is L4C_DC_HSPAP_CAPABILITY, // (DC) mac-ehs+mac-i/is L4C_LTE_CAPABILITY } </pre>
---------	----------------------------	--

7.18 AT+EGFB – Config IPv4v6 fallback

7.18.1 Designnote

This command use to enable or disable IPv4v6 fallback and set fallback activation sequence (IPv4 then IPv6 or IPv6 then IPv4)

7.18.2 Format

Command	Possible Response(s)
+EGFB=<fallback_enable>,<ipv4_firs>	OK
+EGFB?	+EGFB: <fallback_enable>,<ipv4_first> OK

7.18.3 Field

Type	Short name	Parameter/comment	
Integer	fallback_enable	0	Disable IPv4v6 fallback
		1	Enable IPv4v6 fallback
Integer	ipv4_first	0	IPv6 then IPv4
		1	IPv4 then IPv6

7.19 AT+EGPCAP – Query the Max PDP supported

7.19.1 Description

To query Max context supported by 2G/3G/LTE.

7.19.2 Format

Command	Possible Response(s)
+EGPCAP=?	+EGPCAP: <Max PDP supported> OK

7.20 AT+MSQON – Enable/Disable MTK Smart QoS function

7.20.1 Description

The execution command is to enable/disable MTK Smart Qos (MSQ) function.

7.20.2 Format

Command	Possible Response(s)
+MSQON=<on>	OK or ERROR
+MSQON?	+MSQON: <on>

7.20.3 Field

Type	Short name	Parameter/comment
Integer	on	<on>: a numeric parameter which specifies disable/enable MSQ function. 0: off 1: on

8. Mobile Termination Errors

8.1 AT+CME

8.1.1 Description

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

Test command returns values supported as a compound value.

8.1.2 Format

Command	Possible response(s)
+CME=<n>	
+CME?	+CME: <n>
+CME=?	+CME: (list of supported<n>s)

8.1.3 Field

<n>:

- 0 Disable +CME ERROR:<err> result code and use ERROR instead
- 1 Enable +CME ERROR:<err> result code and use numeric<err> values (refer next sub clause)
- 2 enable +CME ERROR: <err> result code and use verbose<err> values (refer next sub clause)

<err> values (numeric format followed by verbose format):

8.1.4 General errors

0	Phone failure
1	no connection to phone
2	phone adaptor link reserved
3	operation not allowed
4	operation not supported
5	PH SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	text string too long

25	invalid characters in text string
26	dial string toolong
27	invalid characters in dial string
30	no network service
31	network timeout
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)
100	unknown

8.1.5 GPRS-related errors

8.1.5.1 Errors related to a failure to perform an Attach

103	Illegal MS(#3)
106	Illegal ME(#6)
107	GPRS service not allowed(#7)

-
- 111 PLMN not allowed(#11)
 - 112 Location area not allowed(#12)
 - 113 Roaming not allowed in this location area (#13) (Values in parentheses are TS 24.008 causecodes.)

8.1.5.2 Errors related to a failure to Activate a Context

- 132 service option not supported(#32)
- 133 requested service option not subscribed(#33)
- 134 service option temporarily out of order(#34)
- 149 PDP authentication failure

(Values in parentheses are TS 24.008 cause codes.)

8.1.5.3 Other GPRS errors

- 150 invalid mobile class
- 148 unspecified GPRS error

Other values in the range 101-150 are reserved for use by GPRS

9. Annex C

9.1 AT+VTS

9.1.1 Description

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

Note: The command is used only during voice calls.

9.1.2 Format

Command	Possible response(s)
+VTS=<dtmf>	
+VTS=?	(list of supported <tone1>s),(list of supported <tone2>s) ,(list of supported <duration>s)

9.1.3 Field

<DTMF>. A single ASCII character in the set .0-9,#, *, A-D.

For example: AT+VTS = 9 or AT+VTS = A

You can use multiple commands to achieve continuous DTMF tones.

For example: AT+VTS=6; +VTS=2;+VTS=8;+VTS=2

9.1.4 Note

When modem work with application (ex: WM smart phone RIL or ECMT tool) , the application expect the result of AT+VTS is returned immediately . Since user might press keypad to send DTMF very fast, so application would like to send DTMF before the previous DTMF is actually processed in NW

(modem shall help to queue the DTMF request if previous is not finished yet). So we will response the result code immediately to prevent blocking the application's DTMF keypad handling.

Currently, we only check if the digit is valid and if there is any call ongoing (ex: dialing, active exist). If yes, then we will return "OK". But please notice the "OK" doesn't imply that the DTMF is really processed successfully in NW. Ex: it might fail due to MS doesn't have user connection yet. Or it might be fail due to there is no response from NW. Or it might be fail due to there is no speech channel (ex: datacall)

9.2 AT+PCMCTRL – Init Codec

9.2.1 Description

This command is used to open PCM and let PCM into sleep mode

9.2.2 Format

Command	Possible response(s)
AT+PCMCTRL=?	+PCMCTRL: (0-1) OK
AT+PCMCTRL=<n>	OK or ERROR

9.2.3 Filed

The value of n is 0 and 1

0: close codec

1: init codec

9.3 AT+MICVOL – Adjust mic volume

9.3.1 Description

This command is used to adjust Mic volume

9.3.2 Format

Command	Possible response(s)
---------	----------------------

AT+MICVOL=?	+MICVOL: (0-10) OK
AT+MICVOL=n	+MICVOL:n OK

9.3.3 Note

The range value of n is 0 to 10

9.4 AT+SPKVOL – Adjust speaker volume

9.4.1 Description

This command is used to adjust Spk Volume

9.4.2 Format

Command	Possible response(s)
AT+SPKVOL=?	+SPKVOL: (0-10) OK
AT+SPKVOL=n	+SPKVOL:n OK

9.4.2 Note

The range value of n is 0 to 10

9.5 AT+LOOPTEST – Factory loopback test

9.5.1 Description

This command is used to loopback test

9.5.2 Format

Command	Possible response(s)
AT+LOOPTEST=?	+LOOPTEST: (0-1) OK

AT+LOOPTEST= <i>n</i>	OK
-----------------------	----

9.5.3 Note

0: close loopback test

1: open loopback test

9.6 AT+GTPOS – Get LBS

9.6.1 Description

This command Get the base station location information

9.6.2 Format

Command	Possible response(s)
+GTPOS=<mode>	OK
+GTPOS=?	+GTPOS: (0-2) OK

9.6.3 Note

The value of mode: 0-2

0: disconnect link

1: connect link

2: Longitude, Latitude, value\$

10. SMS AT Commands

10.1 AT+CSMS – Select message service

10.1.1 Description

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

10.1.2 Format

Command	Possible response(s)
+CSMS=<service>	+CSMS: <mt>,<mo>,<bm>
+CSMS?	+CSMS:
+CSMS=?	+CSMS: (list of supported<service>s)

10.1.3 Field

<service>:

0 3GPP TS 23.040 [3] and 3GPP TS 23.041[4]

1 3GPP TS 23.040 [3] and 3GPP TS 23.041[4]

The requirement of <service> setting 1 is mentioned under corresponding command descriptions)

<mt>, <mo>, <bm>:

0 Type not supported

1 Type supported

10.2 AT+CPMS – Preferred message storage

10.2.1 Description

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

10.2.2 Format

Command	Possible response(s)
+CPMS=<mem1> [,<mem2>[,<mem3>]]	+CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,<total3> +CMS ERROR: <err>
+CPMS?	+CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,< total2>, <mem3>,<used3>,<total3>CMS ERROR: <err>
+CPMS=?	+CPMS:(list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)

10.2.3 Field

Parameter	Description
<mem1>	SM :SIM card ME: modem SM_P: Sim priority ME_P: Modem NV priority MT: Modem terminal
<mem2>	SM:SIM card ME: modem SM_P: Sim priority ME_P: Modem NV priority MT: Modem terminal
<mem3>	SM:SIM card ME: modem SM_P: Sim priority ME_P: Modem NV priority MT: Modem terminal
<usedX>	Number of memX used

10.3 AT+CMGF – Message format

10.3.1 Description

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

10.3.2 Format

Command	Possible response(s)
+CMGF=[<mode>]	OK
+CMGF?	+CMGF: <mode>
+CMGF=?	+CMGF: (list of supported<mode>s)

10.3.3 Field

<mode>:

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

10.4 AT+CSCA – Service center address

10.4.1 Description

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

10.4.2 Format

Command	Possible response(s)
+CSCA=<sca>[,<tosca>]	sca:RP SC address tosca: address type OK

+CSCA?	+CSCA: <sca>,<tosca>OK
+CSCA=?	OK

10.5 AT+CSMP – Set text mode parameters

10.5.1 Description

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

10.5.2 Format

Command	Possible response(s)
+CSMP=[<fo>[,<vp>[,<pid>[,<d cs>]]]]	OK
+CSMP?	+CSMP:<fo>,<vp>,<pid>,<dcs> OK
+CSMP=?	+CSMP: (17,49),(0-255),(0-255),(0-255) OK

10.6 AT+CSDH – Show text mode parameters

10.6.1 Description

Set command controls whether detailed header information is shown in text mode result codes.

Test command returns supported values as a compound value.

10.6.2 Format

Command	Possible response(s)
+CSDH=[<show>]	OK or ERROR
+CSDH?	+CSDH: <show>
+CSDH=?	+CSDH: (list of supported<show>s)

10.7 AT+CSCB – Select cell broadcast message types

10.7.1 Description

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

10.7.2 Format

Command	Possible response(s)
+CSCB=[<mode>[,<mids>][,<dcss>]]]	OK or ERROR
+CSCB?	+CSCB: <mode>,<mids>,<dcss>
+CSCB=?	+CSCB: (list of supported<mode>s)

10.7.3 Field

<mode>:

- 0 Message types specified in<mids> and<dcss>are accepted
- 1 Message types specified in<mids> and<dcss>are not accepted

<mids>: We support 10 message identifiers at most.

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

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

10.7.4 Note1

For <mids> of <mode>=0, our design is to open the <mids> from user input and close other <mids>.

In the following case, user input <mode>=0 and <mids>=2. So open channel 2 and close other channel (channel 1).

AT+CSCB?

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

OK

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

OK

AT+CSCB?

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

OK

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

AT+CSCB?

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

OK

AT+CSCB=0

OK

AT+CSCB?

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

For <dcss> of <mode>=0, our design is to increase the <dcss> from userinput. In the following case, user input <mode>=0 and <dcss>=2. So increase language 2.

AT+CSCB?

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

OK

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

OK

AT+CSCB?

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

OK

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

AT+CSCB?

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

OK

AT+CSCB=0

OK

AT+CSCB?

+CSCB: 0,"", "1"

OK

10.7.5 Note2

For <mids> of <mode>=1, our design is to close all <mids> no matter with

<mids> or not. In the following case, user input <mode>=1. So close all channel.

AT+CSCB?

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

OK

AT+CSCB=1,"2", "2"

OK

AT+CSCB?

+CSCB: 1,"", "1"

OK

In the following case, user input <mode>=1 without <mids>. Also close all channel.

AT+CSCB?

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

OK

AT+CSCB=1

OK

AT+CSCB?

+CSCB: 1,"", "1"

OK

For <dcss> of <mode>=1, our design is to decrease the <dcss> from user input.

In the following case, user input <mode>=1 and <dcss>=2. So decrease language 2.

AT+CSCB?

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

AT+CSCB=1, "2", "2"

OK

AT+CSCB?

+CSCB: 1,"", "1"

OK

In the following case, user input <mode>=1 without <dcss>. So don't decrease any language.

AT+CSCB?

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

OK

AT+CSCB=1

OK

AT+CSCB?

+CSCB: 1,"", "1"

OK

10.8 AT+CSAS – Save settings

10.8.1 Description

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

10.8.2 Format

Command	Possible response(s)
+CSAS[=<profile>]	+CMS ERROR: <err>
+CSAS=?	+CSAS: (list of supported<profile>s)

10.8.3 Field

<profile>:

0-3 manufacturer specific profile number where settings are to be stored

10.9 AT+CREG – Restore settings

10.9.1 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 can not be restored.

10.9.2 Format

Command	Possible response(s)
+CRES[=<profile>]	+CMS ERROR: <err>
+CRES=?	+CRES: (list of supported<profile>s)

10.9.3 Field

<profile>:

0-3 manufacturer specific profile number where settings are to be stored

10.10 AT+CNMI – New message indications to TE

10.10.1 Description

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

10.10.2 Format

Command	Possible response(s)
+CNMI=[<mode>[,<mt>[,<bm>[,<ds> [,<bfr>]]]]]	OK
+CNMI?	+CNMI:

+CNMI=?	+CNMI: (list of supported<mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported<bfr>s)
---------	---

10.10.3 Field

<mode>

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

<mt>

- 0 No SMS-DELIVER indications are routed to the TE.
- 1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code:+CMTI:<mem>,<index>
- 2 SMS-DELIVERs (except class 2 messages and messages inthe message waiting Indication group(store message)) are routed directly to the TE using unsolicited result code:+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>,[<alpha>],<scts>[,<toa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled;about parameters in italics, refer command Show Text Mode Parameters+CSDH)
- 3 Class 3 SMS-DELIVERs are routed directly to TE usingunsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in<mt>=1.

<bm>

- 0 No CBM indications are routed to the TE.
- 2 New CBMs are routed directly to the TE using unsolicited result code: +CBM:
<length><CR><LF><pdu> (PDU mode enabled); or +CBM:
<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> (text mode enabled)
- If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).
- 3 Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.

<ds>:

- 0 No SMS-STATUS-REPORTs are routed to the TE.
- 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:

<bfr>:

+CDS: <length><CR><LF><pdu> (PDU mode enabled); or +CDS: <fo>,<mr>,
[<ra>],[<tora>],[<scts>],[<dt>],[<st>] (text mode enabled)

- 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.

10.11 AT+EMGL– List SMS

10.11.1 Description

This command is used to simplify the response of +CMGL, In EMGL only response <index> and <stat> of each record.

10.11.2 Format

Command	Possible response(s)
+EMGL=[<stat>]	command successful: +EMGL:<index>,<stat>[<CR><LF> +EMGL: <index>,<stat> otherwise: +CMS ERROR: <err>

10.12 AT+CMGR(Text mode) – Read message

10.12.1 Description

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

10.12.2 Format

Command	Possible response(s)
---------	----------------------

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

10.13 AT+CMGR(PDU mode) – Read message

10.13.1 Description

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

10.13.2 Format

Command	Possible response(s)
+CMGR=<index>	if PDU mode (+CMGF=0) and command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> otherwise: +CMS ERROR: <err>
+CMGR=?	

10.14 AT+CNMA(Text mode) – New message acknowledgement to ME/TA

10.14.1 Description

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

10.14.2 Format

Command	Possible response(s)
if text mode (+CMGF=1): +CNMA	+CMS ERROR: <err>
+CNMA=?	

10.15 AT+CNMA(PDU mode) – New message acknowledgement to ME/TA

10.15.1 Description

Execution command confirms correct reception of a new message (SMS- DELIVER or SMS-

STATUS-REPORT) which is routed directly to the TE This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1.

10.15.2 Format

Command	Possible response(s)
if PDU mode (+CMGF=0): +CNMA[=<n>[,<length>[< CR> PDU is given<ctrl- Z/ESC>]]]	+CMS ERROR: <err>
+CNMA=?	if PDU mode (+CMGF=0): +CNMA: (list of supported<n>s)

10.16 AT+CMGS(Text mode) – Send message

10.16.1 Description

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

10.16.2 Format

Command	Possible response(s)
if text mode (+CMGF=1): +CMGS=<da>[,<today>]<CR> text is entered<ctrl- Z/ESC>	if text mode (+CMGF=1) and sending successful: +CMGS: <mr>[,<scts>] if sending fails: +CMS ERROR: <err>
+CMGS=?	

10.17 AT+CMSS(Text mode) – Send message from storage

10.17.1 Description

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

10.17.2 Format

Command	Possible response(s)
+CMSS=<index>[,<da>[,<tda>]]	if text mode (+CMGF=1) and sending successful: +CMSS: <mr>[,<scts>] if sending fails: +CMS ERROR: <err>
+CMSS=?	

10.18 AT+CMGW(Text mode) – Write message to memory

10.18.1 Description

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

10.18.2 Format

Command	Possible response(s)
---------	----------------------

If textmode (+CMGF=1): +CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR> > text is entered <ctrl-Z/ESC>	+CMGW: <index> +CMS ERROR: <err>
+CMGW=?	

10.19 AT+CMGW(PDU mode) – Write message to memory

10.19.1 Description

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

10.19.2 Format

Command	Possible response(s)
if PDU mode (+CMGF=0): +CMGW=<length>[,<stat>]<CR> PDU is given <ctrl-Z/ESC>	+CMGW: <index> +CMS ERROR: <err>
+CMGW=?	OK

10.19.3 Field

<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:

0 "REC UNREAD" received unread message (i.e. new message) 1 "REC READ" received read message

2 "STO UNSENT"stored unsent message (only applicable to SMS)

3 "STO SENT" stored sent message (only applicable to SMS) 4 "ALL" all messages (only applicable to +CMGL command) 7 "DRAFT"

10.20 AT+CMGD – Delete message

10.20.1 Description

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

10.20.2 Format

Command	Possible response(s)
+CMGD=<index>[,<delflag>]	+CMS ERROR: <err>
+CMGD=?	+CMGD: (list of supported<index>s) [, (list of supported<delflag>s)]

10.20.3 Field

<delflag>: an integer indicating multiple message deletion request as follows: 0(or omitted) Delete the message specified in<index>

1 Delete all read messages from preferred message storage,

leaving unread messages and stored mobile originated messages (whether sent or not) untouched

2 Delete all read messages from preferred messages to rage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched

3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.

4 Delete all messages from preferred message storage including unread messages.

10.21 AT+CMMS – More message to send

10.21.1 Description

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

Test command returns supported values as a compound value.

10.21.2 Format

Command	Possible response(s)
+CMMS=[<n>]	
+CMMS?	+CMMS: <n>
+CMMS=?	+CMMS: (list of supported <n>s)

10.21.3 Field

<n>:

0 disable

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

10.22 AT+EQSI – Query storage index

10.22.1 Description

To query storage index.

10.22.2 Format

Command	Possible Response(s)
+EQSI=<storage>	+EQSI: <storage>, <begin>, <end>, <used> OK/ERROR
+EQSI=?	+ESUO: (list of supported <storage>s)

10.22.3 Field

<storage>: string type; SM or ME

<begin>: beginning of index

<end>: ending of index

<used>: number of messages in <storage>

10.22.4 Usage Note

- This command is only supported for phone suite. Others can't use this command to do test.

10.23 AT+ESMSS – SMS Status change mode

10.23.1 Description

SMS status change mode after +CMGR and +CMGL

10.23.2 Format

Command	Possible Response(s)
+ESMSS=<mode>	+CME ERROR: <err>
+ESMSS ?	+ESMSS : <mode>
+ESMSS=?	+ESMSS : (0-1)

10.23.3 Field

<mode>

0 Unchange – SMS status remains as “REC UNREAD” after +CMGR or

+CMGL

1 Change – SMS status changes from “REC UNREAD” to “REC READ” after

+CMGR or+CMGL.

10.24 AT+ETWS – Set ETWS setting

10.24.1 Description

This command is used to set ETWS related settings.

10.24.2 Format

Command	Possible Response(s)
+ETWS=<setting>	+CME ERROR: <err>
+ETWS?	+ETWS:<setting> +CME ERROR: <err>

10.24.3 Field

<setting>: A bit mask value (b8 b7 ... b1 b0). Each bit corresponding to a setting.

bit0: enable ETWS (default value: 0)

bit1: enable receiving ETWS with security check (default value: 0)

bit2: enable receiving test purpose ETWS (default value: 0)

11. Other Proprietary AT Commands

11.1 AT+EQUERY – General query command

11.1.1 Description

To query hardware or MS status.

11.1.2 Format

Command	Possible Response(s)
+EQUERY=<op>	OK or ERROR
+EQUERY=?	OK

11.1.3 Field

Type	Short name	Parameter/comment
integer	op	0 to write SMS to inbox
		1 Query charger status
		2 Query clam status
		3 Query if sms ready
		4 Query if phb ready
		5 Query if open compileoption __SMS_STORAGE_BY_MMI__ And __GEMINI__ (for phone suite).

		6	Query the PHB System module version. When defined PHB_STORAGE_BY_MMI, the version is 2. Else, the version is 1.
		7	Query the SMS System module version. When defined SMS_STORAGE_BY_MMI, the version is 2. Else, the version is 1.

11.1.4 Example

AT+EQUERY=0

+CMGW:(0-3) // SMS support writing SMS to inbox OK

AT+EQUERY=1

+CHAR:1 //chargeris plug-in

OK

AT+EQUERY=2

+CLAM:0 //clamis closed OK

AT+EQUERY=5

+EQMO:1 //#ifdefined(
SMS_STORAGE_BY_MMI)&&defined(GEMINI) OK

AT+EQUERY=6

+EPBV: 1

AT+EQUERY=7

+ESMSV: 1

11.2 AT+EIND – Indication control command

11.2.1 Description

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

11.2.2 Format

Command	Possible Response(s)
+EIND= <flag>	OK or ERROR
+EIND?	+EIND: <ind>
+EIND=?	+EIND: (0-4294967295)

11.3.3 Field

Type	Short name	Parameter/comment	
Integer	Flag	Bit 0	Any value(0~4294967295) that bit 0 is 1 e.g.1,3,5..
		Bit 1	Any value(0~4294967295) that bit 1 is 1 e.g.2,3,6..
		Bit 2	Any value(0~4294967295) that bit 2 is 1 e.g.4,5,..
		Bit 3	Any value(0~4294967295) that bit 3 is 1 e.g. 8,9..
		Bit 7	Any value(0~4294967295) that bit 7 is 1 e.g.128,129,130..
Integer	ind	1	SMS_READY
		2	PHB_READY
		4	file change for PLMN files
		8	file change for EONS files

		16	Invalid SIM
		32	PHB_NOT_READY
		64	TCM_READY
		128	AT_READY

11.3 AT+EINFO – URC Information control command

11.3.1 Description

Set command to enable some proprietary NW info and cell info unsolicited result code(URC) information report.

11.3.2 Format

Command	Possible Response(s)
+EINFO=<flag>[,<type>,<n>]	OK or ERROR
+EINFO?	+EINFO: <flag>
+EINFO=?	+EINFO: (0-4294967295)

11.3.3 Field

Type	Short name	Parameter/comment	
Integer	Flag	Bit 0	Any value(0~4294967295) that bit0 is 1 e.g.1,3,5..
		Bit 1	Any value(0~4294967295) that bit 1 is 1 e.g.2,3,6..
		Bit 2	Any value(0~4294967295) that bit 2 is 1 e.g.4,5,..
		Bit 3	Any value(0~4294967295) that bit 3 is 1 e.g. 8,9..
		Bit 7	Any value(0~4294967295) that bit 7 is 1 e.g.128,129,130..

Currently, flag bit and its URC mapping are listed as below.

Bit	URC
Bit 0	+ESMLA (see section 9.2 for detail)
Bit 1	+ECFU (see section 4.4 for detail)
Bit 2	+ECELLINFO(see section 11.2 for detail)
Bit 3	+ENWINFO(see section 11.3 for detail)
Bit 4	+ESPEECH (see section 3.3 for detail)
Bit 5	+STKPCI
Bit 6	+ECIPH (see section 13.8 for detail)
Bit 7	+EMMRRS (for multiple SIM project only)
Bit 8	+EPKTFI
Bit 9	+EWARNIN

<type> integer type

The EM type of NW info to be operated. This field is only used when Bit 3 of

<flag> is 1.

<n> integer type

This field is only used when Bit 3 of

<flag> is 1. 0: enable 1:disable

2: unchanged

11.3.4 Get Neighboring and Network information from URC

Use AT+EINFO to enable URC for EM Network information and Neighbor Cell information .Interpret the EM Network or Neighbor Cell information raw

data from the URC with the corresponding structure definition (see section

13.10 for the corresponding structure name of the EM INFO raw data and section 13.9 for the corresponding structure name of the Neighbor Cell INFO raw data)

11.3.5 Example

“AT+EINFO=4” is to enable +ECELLINFO URC

“AT+EINFO=8,2,1” is to disable +ENWINFO URC type 2 (RR_EM_CHANNEL_DESCR_INFO, see section 13.10)

11.4 AT+EBOOT – Boot up Mode

11.4.1 Description

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

11.4.2 Format

Command	Possible Response(s)
+EBOOT=<mode>	OK or ERROR

11.4.3 Field

<mode>

- 0 Normal bootup
- 1 Exception bootup

11.4.4 Note

The command is applicable for modem projectonly

Must use this command before the first AT+CFUN/AT+EFUN execution during bootup.

11.5 AT+EPCT – PS Conformance test mode

11.5.1 Description

For the following cases that our handset behavior needs to be adjusted to meet test requirement of CTA/FTA/IOT

- CTA/FTA/IOT lab equipment is not capable with Spec
- Our handset make some changes for real network for better performance or some other reason.
- In one kind of test, CTA for example, there maybe two cases that need exclusive behavior of handset. Just like case A need handset send some signal to network, But Case B actual need handset do not send those signal to network.

11.5.2 Format

Command	Possible Response(s)
+EPCT=?	+EPCT: <list of supported mode> OK
+EPCT?	+EPCT: <mode>,<profile> OK
+EPCT=<mode>[,<profile>]	OK

11.5.3 Field

<mode>: integer type.

Availabe test mode defined in

ps_em_enum.h .typedef enum

```
{
PS_CONF_TEST_NONE,
PS_CONF_TEST_CTA,
PS_CONF_TEST_FTA,
PS_CONF_TEST_IOT,
PS_CONF_TEST_OPERATOR,
PS_CONF_TEST_FACTORY,
PS_CONF_TEST_END
```

```
} ps_conf_test_mode_enum;
```

<profile>: integer type. Specific test profile under the<mode>

Available test profile defined in ps_em_enum.h. Following is the subset of

Available test profile.

```
/* CTA Items */
```

```
#defineCTA_INTEGRITY_CHECK_BIT_FOR_MM          0x00000001
#defineCTA_TL1_BIT_FOR_TL1                    0x00000002
#defineCTA_K1297_BIT_FOR_RRCE                 0x00000004
#defineCTA_SNCONFLICT_BIT_FOR_RLC_RRCE        0x00000008
#defineCTA_CFQUERY_BIT_FOR_SS                 0x00000010
#defineCTA_PLMN_LOCK_BIT_FOR_CSCE             0x00000020
#defineCTA_OPEN_MEAS_BIT_FOR_CSCE             0x00000040
#defineCTA_DISABLE_DPA_BIT_FOR_RRCE           0x00000080
#defineCTA_OPEN_INVALID_INTRA_CELL_REPORT__BIT_FOR_MEME 0x00000100
#defineCTA_AUTO_ADJUST_BIT_FOR_RRCE           0x00000200
#defineCTA_DISABLE_UPA_BIT_FOR_RRCE           0x00000400
#defineCTA_RELEASE_ADAPTION_BIT_FOR_RRCE      0x00000800
```

```
/* FTA Items */
```

```
#defineFTA_TEST_ANITE          0x00000001
#defineFTA_TEST_CRTUG          0x00000002
#defineFTA_TEST_CRTUW          0x00000004
#defineFTA_TEST_ANRITSU        0x00000008
#defineFTA_TEST_CMW500         0x00000010
```

11.5.4 Note

Example:

Set handset to CTA mode without special setting -->AT+EPCT=1

Set handset to CTA mode with special setting bits(bit 123on) -->AT+EPCT=1,7

7 = 0000 0111(bit 1/2/3 set to 1 meanson)

11.6 AT+ECCP – Enable/Disable Video Call

11.6.1 Description

This command is used to diable video call functionality.

11.6.2 Format

Command	Possible Response(s)
AT+ECCP=<op>	OK +CME ERROR: <err>

11.6.3 Field

<op>:

0 Enable VTcall

1 Disable VTcall

11.7 AT+EOPS – Enhanced operator selection

11.7.1 Description

This command is similar to +COPS, with additional support for specified ARFCN. Set command forces an attempt to select and register the GSM/UMTS network operator. If the selected operator is not available, ERROR is returned.

This command also provides semi-auto selection, which can trigger one manual selection procedure

but keep the selection mode in automatic. Read command returns the current mode, the currently selected operator. EOPS can get current PLMN under both registered and limited service while COPS can only get current PLMN under registered service.

Test command returns operator list present in the network.

11.7.2 Format

Command	Possible response(s)
AT+EOPS=<mode>[,<format>,<oper>[,<Act>]]	OK +CME ERROR: <err>
AT+EOPS?	+EOPS:<mode>,<format>,<oper>,<act> > +CME ERROR: <err>
AT+EOPS=?	OK

11.7.3 Field

<mode>: integer type

- 0 automatic (<oper> field is ignored)
- 1 or 4 manual (<oper> field shall be present)
- 3 set only <format> (for read command +COPS?), do not attempt registration / deregistration

<format>: integer type

- 0 long format alphanumeric<oper>
- 1 short format alphanumeric<oper>
- 2 numeric<oper>

<oper>: string type;

<format> of +COPS indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A [10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters

converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network code digit 2)(network code digit 1)

<stat>:

- 0 unknown
- 1 available
- 2 current
- 3 forbidden

<AcT>: access technology selected

- 0 GSM
- 2 UTRAN
- 7 LTE

<arfcn>: interger type range 0~0xFFFFFFFF Valid arfcn, value

GSM:

band900: 0~124, 975~1023 band1800: 512~885 band1900:512~810 band850:128~251

UTRAN TD-SCDMA: Band A: 10054~10121 Band E: 11504~11996 Band F: 9404~9596

UTRAN FDD:

Band 1: 10562~10838

band 2: 9662 ~ 9938, 412, 437, 462, 487, 512, 537, 562, 587, 612, 637, 662,

687

band 3: 1162 ~ 1513

band 4: 1537 ~ 1738, 1887, 1912, 1937, 1962, 1987, 2012, 2037, 2062, 2087

band 5: 4357 ~ 4458, 1007, 1012, 1032, 1037, 1062, 1087

band 6: 4387 ~ 4413, 1037, 1062

band 7: 2237 ~ 2563, 2587, 2612, 2637, 2662, 2687, 2712, 2737, 2762, 2787,
2812, 2837, 2862, 2887, 2912

band 8: 2937 ~ 3088

band 9: 9237 ~ 9387

band 10: 3112 ~ 3388, 3412, 3437, 3462, 3487, 3512, 3537, 3562, 3587,
3612, 3637, 3662, 3687

band 11: 3712 ~ 3787

band 12: 3842 ~ 3903, 3932, 3957, 3962, 3987, 3992

band 13: 4017 ~ 4043, 4067, 4092

band 14: 4117 ~ 4143, 4167, 4192

band 15: reserved

band 16: reserved

band 17: reserved

band 18: reserved

band 19: 712 ~ 763, 787, 812, 837

band 20: 4512 ~ 4638

band 21: 862 ~ 912

band 22: 4662 ~ 5038

LTE:

0~46589, if not supported, modem will ignore FDD:

Band 1: 0~599

Band 2: 600~1199

Band 3: 1200~1949

Band 4: 1950~2399

Band 5: 2400~2649

Band 6: 2650~2749

Band 7: 2750~3449

Band 8: 3450~3799

Band 9: 3800~4149 Band10: 4150~4749 Band11: 4750~4949 Band12: 5010~5179 Band13:
5180~5279 Band14: 5280~5379 Band17: 5730~5849 Band18: 5850~5999 Band19: 6000~6149
Band20: 6150~6449 Band21: 6450~6599 Band22: 6600~7399 Band23: 7500~7699 Band24:
7700~8039 Band25: 8040~8699 Band26: 8690~9039 Band27: 9040~9209 Band28: 9210~9659
Band29: 9660~9769 Band30: 9770~9869 Band31: 9870~9919 Band32:9920~10359

TDD:

Band33:36000~36199 Band34:36200~36349 Band35:36350~36949 Band36:36950~37549
Band37:37550~37749 Band38:37750~38249 Band39:38250~38649 Band40:38650~39649
Band41:39650~41589 Band42:41590~43589 Band43:43590~45589 Band44:45590~46589

11.7.4 Note

Currently 3G operator selection with specified ARFCN only support TD-SCDMA.

The command format for <mode> 5 is all the same as mode 1 or 4, but the execution result will not cause change of selection mode. This selection mode is related to the operator H3G.

11.7.5 Change History

<mode> 5 is only supported in some branch/projects, by customer request.

11.8 AT+ECELCK – Cell lock

11.8.1 Description

This command is used to set or cancel cell lock, and get the currently locked cell if any.

11.8.2 Format

Command	Possible response(s)
AT+ECELCK=<mode>,[<enabled_bitmap>], <band_indicator>,<arfcn>,[<arfcn>,...]	OK/ ERROR
AT+ECELCK=?	+ECELCK: (0,1)
AT+ECELCK?	+ECELCK: <enabled_bitmap>, <band_indicator>,<arfcn>,[<arfcn>,...]OK

11.8.3 Field

<mode> integer type

0: cancel cell lock (for the only <arfcn>)

1: set cell lock (for the only <arfcn>)

2: get extended cell lock, this will get the current locked cells' arfcn.

3: set extended cell lock, this will set lock for a group of cells by different arfcn (maximum 3). Only in this mode, more than one <arfcn> can be entered in the following parameter.

4: cancel extended cell lock, this will cancel all cell lock.

<enabled_bitmap> integer type 0~7

Bits set to 1 indicate which <arfcn> to be locked. Ex. 00000101 => the 1st and 3rd <arfcn> is valid.

<band_indicator> integer type 0: not 1900 band cell

1: 1900 band cell

<arfcn> integer type: the cell's arfcn to be locked Valid arfcn value GSM:

band900: 0~124, 975~1023

band1800: 512~885 band1900: 512~810 band850: 128~251

11.8.4 Note

Currently only GSM cell lock is supported.

11.8.5 Usage Note

After AT+ECELCK executed successfully, the cell lock will take effect in the next plmn search procedure. So the tester need to trigger a plmn search procedure after this ATcommand.

11.9 AT+ESUO – Set UART owner

11.9.1 Description

To set UART owner.

11.9.2 Format

Command	Possible Response(s)
+ESUO=<mode>	OK/ERROR
+ESUO?	+ESUO: <owner>, <default owner>
+ESUO=?	+ESUO: (list of supported<owner>s)

11.9.3 Field

<mode>:

3: switch UART owner to DT (Unused)

4: switch UART owner to ATCI

5: switch UART owner to ATCI_2

6: switch UART owner to ATCI_3

7: switch UART owner to ATCI_4...

n: switch UART owner to ATCI_(n-3)

<owner>:

3: DT (Unused)

4: ATCI

5: ATCI_2

6: ATCI_3

7: ATCI_4...

n: ATCI_(n-3)

<default owner>: the default uart setting owner

4: ATCI

5: ATCI_2

6: ATCI_3

7: ATCI_4...

n: ATCI_(n-3)

11.9.4 Example

AT+ESUO=?

+ESUO: (3-4) (support DT)

OK

AT+ESUO=?

+ESUO: (3-5) (support DT & dual SIM)

OK

AT+ESUO=?

+ESUO: (3-6) (support DT & 3 SIM)

OK

AT+ESUO=?

+ESUO: (3-7) (support DT & 4 SIM)

OK

11.10 AT+EGMR – Mobile revision and IMEI

11.10.1 Description

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

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

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

After reboot, then MMI *#06# and MM will know the update.

11.10.2 Format

Execution command: AT+ EGMR =<op>,<type>[,str]

Test command: AT+ EGMR =? Show if the command is supported

11.10.3 Field

Type	Short	Long name	Parameter/comment
Integer	op	operation	get 0
			Set 1
Integer	type	Revision type	Baseband chipset (only for op= 0) 0
			DSPcode (only for op=0) 1

			DSP patch (only for op= 0)	2
			MCUsoftware (only for op=0)	3
			MS board(hardware) (only for op= 0)	4
			Serial Number	5
			Melodyrevision (only for op=0)	6
			SIM1 IMEI	7
			SV (Software Version in IMEISV: 2 digit	9
			SIM2 IMEI	10
			SIM3 IMEI	11
			SIM4 IMEI	12
			Release Flavor	13
			DSP label	14
			DSP build time	15

11.10.4 Response

Test command :

+EGMR: (0,1),(0-9)	Feature phone project before 08BW08.46
+EGMR: (0,1),(0-5,7-9)	Non-Gemini project
+EGMR: (0,1),(0-5,7-12)	Gemini project
+EGMR: (0,1),(0-5,7-9,13-15)	Non-Gemini MOLY project after W13.50
+EGMR: (0,1),(0-5,7-15)	Gemini MOLY project after W13.50

Execution command:

When type = (1-7,9):

[+EGMR: "str"]

OK

When type = 8 (+EGMR=0,8 to get MMI resource):

+AUDIO: "ver"

+IMAGE: "ver"

+FONT: "ver"

+STR: "ver"

OK

11.10.5 Example

0 ReadIMEI:

AT+EGMR=0,7

+EGMR: "135790246811220" OK

1 Write IMEI:

AT+EGMR=1,7,"123451234512345"

OK

AT+EGMR=0,7

+EGMR: "123451234512345"

OK

2 Read SV of IMEI SV

AT+EGMR=0,9

+EGMR: "78"

OK

3 Write SV

AT+EGMR=1,9,"01"

OK

AT+EGMR=0,9

+EGMR: "01"

OK

4 Read DSPLabel

AT+EGMR=0,14

+EGMR: "DSPMOLY.W13.50.LTE.p4"

OK

5 Read DSP Buildtime

AT+EGMR=0,15

+EGMR: "2013/11/28 2:7:33"

OK

6 Query if support LTE_ATTACH_PDN_ESM_BLOCK_INVALID_APN

AT+EGMR=0,16

+EGMG:"1"

OK

7 Query L4C PS feature supported version

AT+EGMR=0,17,0+EGMR:0, 3 OK

11.10.6 Note

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

11.11 AT+WAKEUPCFG Configure module wakeup host function

11.11.1 Description

This Command is used to configure module wakeup host function.

11.11.2 Format

Command	Possible response(s)
+WAKEUPCFG=?	+WAKEUPCFG: (0,1)[,(0-7)] OK
+WAKEUPCFG?	+WAKEUPCFG: <n>,<source> OK
+WAKEUPCFG=<n>[,<source>]	OK/ERROR

11.11.3 Field

n:

0 close wakeup host function

1 open wakeup host function

source

Bit[3-7]	undefine
Bit2	Data
Bit1	Sms
Bit0	Call

Example : Call:0B001 SMS:0B010 Data:0B100

 Call and SMS: 0B011 SMS and Data: 0B110

11.12 AT+EPSB – Get packet switch bearer capability

11.12.1 Designnote

This command is used to query the modem capability of PS service.

11.12.2 Format

Command	Possible Response(s)
+EPSB=?	OK
+EPSB?	+EPSB: <bearer>
+EPSB	+EPSB: <bearer>

11.12.3 Field

Type	Short name	Parameter/comment
------	------------	-------------------

Integer	bearer	<p>A bit mask indicate the corresponding access technology supported or not.</p> <p>GPRS: 0x01</p> <p>EDGE: 0x02 WCDMA: 0x04 TD-SCDMA: 0x08</p> <p>HSDPA: 0x10</p> <p>HSUPA: 0x20</p> <p>HSPA+: 0x40</p> <p>LTE FDD: 0x80</p> <p>LTE TDD: 0x100</p>
---------	--------	---

11.12.4 Note

This command only returns the modem software capability, but not the hardware capability. In other words, this command can't be used to query the eFUSE status, so please be noted when modem has utilized eFUSE to change the hardware capability.

11.13 AT+EPOF – Power off modem

11.13.1 Designnote

This command is used to power off modem but will not cut off power, so that AP side can power on modem by AT+EPON to save some time. This is a existing command, the only different is that it will not call driver API to cut off power, this part is implement in UEM.

11.13.2 Format

Command	Possible Response(s)
+EPOF	OK

+EPOF=?	OK
---------	----

11.13.3 Note

For dual SIM or multiple SIM project, please always send the command to protocol_1.

11.14 AT+EPON – Resetmodem

11.14.1 Designnote

This command is used to reboot modem by trigger watch dog reset.

11.14.2 Format

Command	Possible Response(s)
+EPON	OK
+EPON=?	OK

11.15 AT+ESIMINFO – Query SIM information

11.15.1 Designnote

The set command is used to query SIM related information.

11.15.2 Format

Command	Possible Response(s)
+ESIMINFO=[<mode>]	+ESIMINFO: <mode>, <param1> OK ERROR

11.15.3 Field

Type	Short name	Parameter/comment
------	------------	-------------------

Integer	mode	0	ATR info
		1	CDMA info

If mode = ATR info

<param1>: string type

The ATR received when modem reset this card.

If mode = CDMA info

<param1>: integer type

0	No SIM card is inserted
1	GSM SIM is inserted (Only GSM IMSI is existed)
2	CDMA SIM is inserted (Only CDMA IMSI is existed)
3	Dual SIM is inserted (Both GSM and CDMA IMSI are existed)
4	SIM error or type unknown (Both GSM and CDMA IMSI are not existed)

11.16 AT+ESPN – Read SIM SPN

11.16.1 Description

This command is used to read SIM card's SPN file.

11.16.2 Format

Command	Possible Response(s)
AT+ESPN?	+ESPN: <spn> OK ERROR // No valid SPN
At+ESPN=?	+ESPN: (0-1) OK

11.16.3 Field

<spn>: string type, service provider name

11.17 AT+ESWLA – Software LA and debugging utility

11.17.1 Description

Set command can enable SoftwareLA, force ASSERT target, enable or disable memory leakage check .

11.17.2 Format

Command	Possible Response(s)
+ESWLA=<op>	OK or ERROR

11.17.3 Field

Type	Short name	Parameter/comment	
Integer	Op	0	Force ASSERT target
		1	Enable SoftwareLA

11.17.4 Note

op 1 is only supported in MTK_INTERNAL .

11.18 AT+CSCLK – Configure slow clock

11.18.1 Description

This command is used to configure slow clock

11.18.2 Format

Command	Possible Response(s)
---------	----------------------

+CSCLK=<n>	OK or ERROR
------------	-------------

11.18.3 Field

Type	Short name	Parameter/comment	
Integer	n	0	Disable slow clock
		1	Enable Slow clock,it is controlled by DTR
		2	Enable slow clock automatically. When there is no interrupt(on air and hardware such as GPIO interrupt or data in serialport), module can enter sleep mode. Otherwise, it will quitsleep mode. it is controlled by GPIO 0

12. Other Proprietary Unsolicited Result code

12.1 Unsolicited result code :+ESCRI

12.1.1 Description

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

12.1.2 Format

Unsolicited result code
+ESCRI: <report_value>

12.1.3 Field

<report_value>: integer

SCRI_REQ_SENT = 0,

SCRI_CS_SESSION_ONGOING = 1,

SCRI_PS_SIGNALLING_ONGOING = 2,

SCRI_NO_PS_DATA_SESSION = 3,

SCRI_REQ_NOT_SENT = 4,

SCRI_NOT_ALLOWED = 5

SCRI_REQ_IND = 6

12.2 Unsolicited result code:+ESIMS

12.2.1 Description

Indicate the SIM is inserted or not and related cause

12.2.2 Format

+ESIMS: <sim_inserted_status>,<cause >

12.2.3 Field

<sim_inserted_status>: integer

0 SIM not presented

1 SIM presented

<cause>: integer

0 SIM_CARD_REMOVED,

1 SIM_ACCESS_ERROR,

2 SIM Refresh

3 // Reserved for otheruse

4 // Reserved for otheruse

5 SIM_ACCESS_PROFILE_ON

6 SIM_ACCESS_PROFILE_OFF

7 DUALSIM_DISCONNECTED

8 DUALSIM_CONNECTED

9 SIM_VSIM_ON

10 SIM_VSIM_OFF

11 SIM_PLUG_OUT

12	SIM_PLUG_IN
13	SIM_RECOVERY_START
14	SIM_RECOVERY_END
15	SIM_IMEI_LOCK_FAIL
16	SIM_OP09_LOCK_FAIL

12.3 Unsolicited result code: +CIEV

12.3.1 Description

This URC is the result code of an indicator event

12.3.2 Format

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

12.3.2 Filed

<ind>: integer type value

7: SMS stroage full indication(enable this URC with AT+CMER=0,0,0,1)

+CIEV:7, <status>

<status>: integer

- 0 sms storage available
- 1 sms SIM and ME storage full
- 2 sms SIM storage full
- 3 sms ME storage full

9: NITZ date/time/timezone information (enable this URC with AT+CTZR=1)

+CIEV:9,<UT>,<TZ>[,<DST>]

<UT>:, Universal Time, String type

"YY/MM/DD,HH:MM:SS"

<TZ>: Local Time Zone, Integer type

Ex: +4 or -4

<DST>: Daylight Saving Time. Integer type

1: Summer time

0: Winter time

Ex: +CIEV:9,"09/05/16,16:56:00",-28,1

10: NITZ network name information (enable this URC with AT+CTZR=1)

+CIEV:10,<plmn_id>,<full_name>,<short_name>,<is_full_name_hex_str>,<is_short_name_hex_str>
tr>

<plmn_id>,<full_name>,<short_name>:string type

<is_full_name_hex_str>:integer type

0:<full_name> is ASCII string,such as "AABB"

1:<full_name> is hex decimal string in UCS2(big-endian) format,such as "0065006500660066"

<is_short_name_hex_str>:integer type

0:<short_name> is ASCII string,such as "AB"

1: <short_name> is hex decimal string in UCS2(big-endian) format,such as "00650066"

Ex:+CIEV:10,"00101","AABB","00650066",0,1

12.4 Unsolicited result code: +CTZV

12.4.1 Description

This URC is the result code of an indicator event

12.4.2 Format

Unsolicited result code

+CTZV: <TZ>[,<DST>]

12.4.2 Filed

<TZ> Local Time Zone,Integer type

Ex: +4 or -4

<DST> Daylight Saving Time.Integer type

1: Summer time

0: Winter time

13. TCPIP AT Command

13.1 AT+CIPMUX – Start up multiple IP connection

13.1.1 Description

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

13.1.2 Format

Command	Possible Response(s)
+CIPMUX=?	+CIPMUX: (0,1) OK
+CIPMUX?	+CIPMUX: <n>
+CIPMUX=<n>	OK or ERROR

13.1.3 Field

<n>:

0 Single IP connection

1 Multiple IP connection

13.2 AT+CSTT – Start task and set APN, PDP TYPE, USER NAME, PASSWORD

13.2.1 Description

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

13.2.2 Format

Command	Possible Response(s)
---------	----------------------

+CSTT=?	+CSTT: "APN","PDP TYPE","USER","PWD" OK
+CSTT?	+CSTT: <APN>,<pdp type>,<user name>,<pass word>
+CSTT=<APN>,<pdp type> ,<username>,<password>	OK or ERROR
Reference	Note: The write command and execution command of this command is valid only at the state of IP INITIAL. After this command is executed, the state will be changed to IP START.

13.2.3 Field

- <APN>** A string parameter which indicates the GPRS access point name.
- <pdp type>** (Packet Data Protocol type) astring parameter.
- IP Internet Protocol (IETF STD5)
 - IPV6 Internet Protocol, version 6 (see RFC 2460)
 - IPV4V6 virtual <PDP_type> introduced to handle dual IP stack UE capability (see the 3GPP TS 24.301)
- <user name>** A string parameter which indicates the GPRS user name,Alphanumeric ASCII text string up to 15 characters
- <password>** A string parameter which indicates the GPRS password,Alphanumeric ASCII text string up to 15 characters.

13.3 AT+CIICR – Bring up wireless connection with GPRS or CSD

13.3.1 Description

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

13.3.2 Format

Command	Possible response(s)
+CIICR=?	OK
+CIICR	OK or ERROR
Reference	Note 1. Max Response Time 150 seconds. 2. After module accepts the activated operation, if it is activated successfully, module state will be changed to IP GPRSACT, and it responds OK, otherwise it will respond ERROR.

13.4 AT+CIFSR – Get local IP address

13.4.1 Description

This command is used to get local IP address..

13.4.2 Format

Command	Possible response(s)
+CIFSR=?	OK
+CIFSR	+CGPADDR: 1, "<IP address>" OK

13.4.3 Field

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

13.5 AT+CIPSTART – Start TCP or UDP connection

13.5.1 Description

This command is used to start TCP or UDP Connection.

13.5.2 Format

Command	Possible response(s)
+CIPSTART=?	1) If single IP connection(CIPMUX=0) +CIPSTART:("TCP","UDP"),(0-255).(0-255).(0-255).(0-255),"(1-65535)" +CIPSTART:("TCP","UDP"),"DOMAINNAME","(1-65535)" OK 2) If multi-IP connection(CIPMUX=1) +CIPSTART:(0-9),("TCP","UDP"),(0-255).(0-255).(0-255).(0-255)" ,(1-65535)" +CIPSTART:(0-9),("TCP","UDP"),"DOMAINNAME","(1-65535)" OK
If single IP connection (CIPMUX=0) +CIPSTART=<mode> ,<IP address or domain name> ,<port> If multi-IP connection (CIPMUX=1) +CIPSTART=<id>,<mode> ,< IP address or domain name > ,<port>	If format is right response OK otherwise response +CME ERROR: <err> Response when connection exists [<n>,)ALREADY CONNECT Response when connection is successful [<n>,)CONNECT OK Otherwise [<n>,)CONNECT FAIL
Reference	Note 1.Max Response Time 45 seconds. 2.It is necessary to process "AT+CSTT, AT+CIICR, AT+CGDATA".

13.5.3 Field

- <id>** 0..9 A numeric parameter which indicates the connection number
- <mode>** A string parameter which indicates the connection type
- "TCP" Establish a TCP connection
- "UDP" Establish a UDP connection
- <IP address>** A string parameter which indicates remote server IP address
- <port>** Remote server port

13.6 AT+CIPSEND – Send data through TCP or UDP connection

13.6.1 Description

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

13.6.2 Format

Command	Possible response(s)
+CIPSEND=?	1) If single IP connection (CIPMUX=0) +CIPSEND: (1-1460) OK 2) If multi-IP connection (CIPMUX=1) +CIPSEND: (0-9),(1-1460) OK

If single IP connection (CIPMUX=0) +CIPSEND=<length> If multi-IP connection (CIPMUX=1) +CIPSEND=<id>,<length> Or +CIPSEND=<id>(tap CTRL+Z to send)	1) If single IP connection (CIPMUX=0) When CIPQSEND=0 SEND OK When CIPQSEND=1 DATA ACCEPT:<length> 2) If multi-IP connection (CIPMUX=1) When CIPQSEND=0 SEND OK When CIPQSEND=1 DATA ACCEPT:<n>,<length>
If single IP connection (CIPMUX=0) +CIPSEND(tap CTRL+Z to send)	When CIPQSEND=0 SEND OK When CIPQSEND=1 DATA ACCEPT:<length>
Reference	Note: 1.Max Response Time 15 seconds.

13.6.3 Field

<id> 0-9 A numeric parameter which indicates the connection number

<ip> A string parameter which indicates remote server IP address

13.7 AT+CIPCLOSE – Close TCP or UDP connection

13.7.1 Description

This command is used to Close TCP or UDP Connection.

13.7.2 Format

Command	Possible response(s)
---------	----------------------

+CIPCLOSE=?	1) If single IP connection (CIPMUX=0) OK 2) If multi-IP connection (CIPMUX=1) +CIPCLOSE: (0-9) OK
If single IP connection (CIPMUX=0) +CIPCLOSE	If single IP connection (CIPMUX=0) CLOSE OK
If multi-IP connection (CIPMUX=1) +CIPCLOSE=<id>	If multi-IP connection (CIPMUX=1) <n>,CLOSE OK
Reference	Note: 1.Max Response Time 15 seconds.

13.8.3 Field

<id> 0-9 A numeric parameter which indicates the connection number

<ip> A string parameter which indicates remote server IP address

13.8 AT+CIPSHUT – Deactivate GPRS PDP context

13.8.1 Description

This command is used to deactivate GPRS PDP Context

13.8.2 Format

Command	Possible response(s)
+CIPSHUT=?	OK
+CIPSHUT	SHUT OK/ERROR

Reference	Note 1.Max Response Time 150 seconds. 2.If this command is executed in multi-connection mode, all of the IP connection will be shut. 3.User can close GPRS PDP context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.
-----------	--

13.9 AT+CIPSTATUS – Query current connection status

13.9.1 Description

This command is used to Query Current Connection Status.

13.9.2 Format

Command	Possible response(s)
+CIPSTATUS=?	1) If in single-IP mode (CIPMUX=0) OK 2) If in multi-IP mode (CIPMUX=1) +CIPSTATUS:(0-9) OK
+CIPSTATUS	1) If in single-IP mode (CIPMUX=0) STATE: <state>OK 2) If in multi-IP mode (CIPMUX=1) STATE: <state> +CIPSTATUS: 0,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state>. +CIPSTATUS: 5,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state> OK

13.9.3 Field

<bearer> 0-1 GPRS bearer, default is 0

<client state> INITIAL

 CONNECTED

 CLOSED

<state> IP INITIAL

 IP START

 IP GPRSACT

 IP APNETACT

 IP STATUS

 TCP CONNECTING/UDP CONNECTING

 CONNECT OK

 TCP CLOSING/UDP CLOSING

 TCP CLOSED/UDP CLOSED

 PDP DEACT

 IP PROCESSING

13.10 AT+CIPSRIP – Whether to display sender ip

13.10.1 Description

This command is used to Determine Whether to Display the Sender IP.

13.10.2 Format

Command	Possible response(s)
+CIPSRIP=?	+CIPSRIP:(0,1)
+CIPSRIP?	+CIPSRIP:<mode>

+CIPSRIP=<mode>	OK or ERROR
-----------------	-------------

13.10.3 Field

<mode>	0	Do Not Display the Sender IP
	1	Display the Sender IP

13.11 AT+CIPQSEND – Select data transmitting mode

13.11.1 Description

This command is used to select Data Transmitting Mode.

13.11.2 Format

Command	Possible response(s)
+CIPQSEND=?	+CIPQSEND: (0-1)
+CIPQSEND?	+CIPQSEND: <n>
+CIPQSEND=<n>	OK

13.11.3 Field

<n>	0	Normal Mode:when server receives data ,response [<id>,)SEND OK
	1	Fast Mode: when module receives data ,response DATA ACCEPT: [<id>,)<length>

13.12 AT+CIPACK – TCP/IP Data flow calculation

13.12.1 Description

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

13.12.2 Format

Command	Possible response(s)
---------	----------------------

+CIPACK=?	OK
If in multi-IP mode (CIPMUX=1) +CIPACK=<id>	+ CIPACK: <txlen>,<acklen>,<nacklen> OK
If in single-IP mode (CIPMUX=0) +CIPACK	+ CIPACK: <txlen>,<acklen>,<nacklen> OK

13.12.3 Field

<id> 0..9 A numeric parameter which indicates the connection number

Txlen The data amount which has been sent(MAX: $2^{32}-1$)

Acklen The data amount confirmed successfully by the server(MAX: $2^{32}-1$)

Nacklen The data amount without confirmation by the server(MAX: $2^{32}-1$)

13.13 AT+CDNSCFG – Configure DNS

13.13.1 Description

This command is used to Configure DNS.

13.13.2 Format

Command	Possible response(s)
+CDNSCFG =?	+CDNSCFG:("PrimaryDNS"),("Secondary DNS")
+CDNSCFG?	Primary DNS:<pri_dns> Secondary DNS:<sec_dns>
+CDNSCFG=<pri_dns>,<sec_dns>	OK

13.13.3 Field

<pri_dns> Primary Domain Name Server Ip

<sec_dns> Secondary Domain Name Server Ip

13.14 AT+CDNSGIP – Get IP address by domain name

13.14.1 Description

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

13.14.2 Format

Command	Possible response(s)
+CDNSGIP=?	OK
+CDNSGIP=<domainname>	+CDNSGIP: <result>,<domain name>,<IP addr>

13.14.3 Field

Result1	get ip address successful
domain name	Domain name string, need use "" double quotes
IPaddr	IP address string, need use "" double quotes

13.15 AT+CIPTKA – Set TCP keepalive parameters

13.15.1 Description

This command is used to Set TCP Keepalive Parameters

13.15.2 Format

Command	Possible response(s)
+CIPTKA=?	+CIPTKA: (0-1),(30-7200),(30-600),(1-9) OK
+CIPTKA?	+CIPTKA:<mode>,<keepIdle>,<keepInterval>,<keepCount> OK

```
+CIPTKA=<mode>[,< keepIdle>
[,<keepInterval>[,<keepCount >]]]
```

OK or ERROR

13.15.3 Field

Mode Set TCP keepalive option.

0 Disable TCP keep alive mechanism

1 Eable TCP keep alive mechanism

KeepIdle Interval type; Idle (in second) before TCP send the initial keepalive probe.

30-7200 Default: 180

KeepInterval Interval type; (in second) between keepalive probes retransmission.

30-600 Default 75

KeepCount Interval type; Invalid value.

1-9 Default: 9

13.16 AT+CIPMODE Select TCPIP application mode

13.16.1 Description

This command is used to Select TCPIP Application Mode

13.16.2 Format

Command	Possible response(s)
+CIPMODE=?	+CIPMODE: (0-9) OK
If in single-IP mode (CIPMUX=0) +CIPMODE	OK

If in multi-IP mode (CIPMUX=1) +CIPMODE=<id>	OK/ERROR <id>enter transparent mode
---	--

13.16.3 Field

Id 0-9 A numeric parameter which indicates the connection number

13.17 AT+CGDATA – Enter data state

13.17.1 Description

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

13.17.2 Format

Command	Possible response(s)
+CGDATA=?	+CGDATA:(list of supported <L2P>s) OK
+CGDATA=[<L2P>[,<cid>[,<chid>]]]	OK or ERROR
Reference	Note 1.Max Response Time 120 seconds. 2.Module state will be changed to IP APNETACT, and it responds OK, otherwise it will respond ERROR.

13.17.3 Field

<L2P> a string parameter that indicates the layer 2 protocol to be used between the TE and MT

M-UPS manufacturer-specific protocol for Network Driver Interface Specification(NDIS)

M-MBIM manufacturer-specific protocol for Mobile Broadband Interface Model(MBIM)

M-IPCORE manufacturer-specific protocol if and only if for LTE project

Other values will result in an ERROR response.

<cid> a numeric parameter which specifies a particular PDP context definition(see the +CGDCONT and +CGDSCONT commands).

<chid> channel id,a.k.a network interface, a numeric parameter used to specify which channel to be binded.Default chid is the same as cid. In the case of IPv4v6 fallback to IPv4 and IPv6 two PDP context,these two context will be assigned to the same network interface via this ATcommamd.

13.18 AT+CIPCCFG – Set CIPSEND response time

13.18.1 Description

This command is used to set cipsend response time.

13.18.2 Format

Command	Possible response(s)
AT+CIPCCFG?	+CIPCCFG:<value> OK
AT+CIPCCFG=?	+CIPCCFG: (5-100) OK
AT+CIPCCFG=<value>	OK or ERROR

13.18.3 Field

Value from 5 to 100,default value:15.

13.19 AT+CIPSERVER – Configure module as server

13.19.1 Description

This command is used to configure module as server.

13.19.2 Format

Command	Possible response(s)
---------	----------------------

AT+CIPSERVER=?	OK
If mode = 0 or 1 AT+CIPSERVER=<mode>[,<type> ,<port>]	If server created successfully,return: SERVER CREATE OK If server already created,return: SERVER ALREADY CREATED If server created fail,return: SERVER CREATE FAIL +CME ERROR:<errno> If server closed successfully,return: SERVER CLOSE OK
If mode = 2 or 3 AT+CIPSERVER=<mode>,<num>	OK

13.19.3 Field

Mode	0	close server
	1	open server
	2	set listen numner
	3	set Whether to display client ip and port
Type	TCP	create TCP server
	UDP	create UDP server
Port	Listening port	
Num	if mode =2,from 1 to 10,default is 10.	
	If mode = 3, 0	not display client ip and port, 1 display client ip and port
Errno	error code.	

13.20 AT+TCPSEND – Send data to client

13.20.1 Description

This command is used to send data to client.

13.20.2 Format

Command	Possible response(s)
AT+TCPSEND=?	+TCPSEND: (0-9),(1-1460) OK
AT+TCPSEND?	OK
AT+TCPSEND=<id>[,<length>]	If send data successfully,return: <id>,SEND OK If send data fail,return: <id>,SEND FAIL +CME ERROR:<errno> If not set length,will enter data mode.
Reference	Note: 1.Max Response Time 15 seconds.

13.20.3 Field

Id A numeric parameter which indicates the connection number.

Length the length of data sent.

13.21 AT+TCPCLOSE – Close client connection

13.21.1 Description

This command is used to close client connection.

13.21.2 Format

Command	Possible response(s)
AT+TCPCLOSE=?	+TCPCLOSE: (0-9) OK
AT+TCPCLOSE=<id>	If close successfully,return: <id>, TCPCLOSE OK If close fail,return: <id>, TCPCLOSE FAIL +CME ERROR:<errno>

13.21.3 Field

Id A numeric parameter which indicates the connection number.

13.22 AT+CIPRXGET Get Data from Network Manually

13.22.1 Description

This command is used to Get Data from Network Manually.

13.22.2 Format

Command	Possible response(s)
AT+CIPRXGET=?	If single IP connection (CIPMUX=0) +CIPRXGET: (0-4),(1-1460) OK If multi-IP connection (CIPMUX=1) +CIPRXGET: (0-4),(0-9),(1-1460) OK

AT+CIPRXGET?	+CIPRXGET: <mode> OK
1. If single IP connection (CIPMUX=0) AT+CIPRXGET=<mode>[,< reqlength>]	OK Or ERROR If single IP connection (CIPMUX=0) if <mode>=2 +CIPRXGET: 2,<reqlength>,<cnflength> 1234567890... OK if <mode>=3 +CIPRXGET: 3,<reqlength>,<cnflength> 5151...
2. If multi-IP connection (CIPMUX=1) AT+CIPRXGET=<mode>[,<id>,< reqlength>]	OK If multi-IP connection (CIPMUX=1) if <mode>=2 +CIPRXGET: 2,<id>,<reqlength>,<cnflength> 1234567890... OK if <mode>=3 +CIPRXGET: 3,<id>,<reqlength>,<cnflength> 5151... OK

13.22.3 Field

Mode 0 Disable getting data from network manually, the module is set to normal mode, data will be pushed to TE directly.

- 1 Enable getting data from network manually.

2 The module can get data, but the length of output data can't exceed 1460 bytes at a time.

3 Similar to mode 2, but in HEX mode, which means the module can get 730 bytes maximum at a time.

Id A numeric parameter which indicates the connection number.

Reqlength Requested number of data bytes (1-1460 bytes) to be read.

Cnflength Confirmed number of data bytes to be read, which may be less than <length>. 0 indicates that no data can be read.

13.23 AT+CIPDOMAIN – select IPV4 or IPV6

13.23.1 Description

This command is used to select IPV4 or IPV6.

13.23.2 Format

Command	Possible response(s)
AT+CIPDOMAIN=?	+CIPDOMAIN: (0-2) OK
AT+CIPDOMAIN?	+CIPDOMAIN: <stat> OK
AT+CIPDOMAIN=<stat>	OK/ERROR

13.23.3 Field

Stat	0	Select ipv4, default is 0.
	1	Select ipv6.
	2	Reserved value.

14. HTTP AT Command

14.1 AT+HTTTPARA – Set http parameter

14.1.1 Description

The command is used to set http parameter.

14.1.2 Format

Command	Possible response(s)
AT+HTTTPARA =?	OK
AT+HTTTPARA=<para>,<value>	OK/ERROR

14.1.3 Field

<para> url, target path
port, target port

<value> Corresponding to the value of url, the <para> parameter is the maximum of 128 bytes, url supports domain name resolution, the default value of port is 80

14.2 AT+HTTPSETUP – HTTP link establishment

14.2.1 Description

The command is used to create HTTP link.

14.2.2 Format

Command	Possible response(s)
AT+HTTPSETUP=?	OK

AT+HTTPSETUP	OK or ERROR
--------------	-------------

14.3 AT+HTTPACTION – Sending HTTP request

14.3.1 Description

The command is used to send HTTP request.

14.3.2 Format

Command	Possible response(s)
AT+HTTPACTION =?	OK
AT+HTTPACTION=<mode> ,[<length>],[<string>]	OK/ERROR

14.3.3 Field

Mode	0 HTTP GET request
	1 HTTP HEAD request
	2 HTTP POSTrequest
Length	Maxium 1002,length of HTTP POST request body
String	Value of HTTP POST request body

14.4 AT+HTTPCLOSE – Close HTTP link

14.4.1 Description

The command is used to close HTTP link

14.5.2 Format

Command	Possible response(s)
---------	----------------------

AT+HTTPCLOSE =?	OK
AT+HTTPCLOSE	OK or ERROR

14.5 AT+HTTPDLOAD – Download HTTP file

14.5.1 Description

The command is used to Download http file.

14.5.2 Format

Command	Possible response(s)
AT+HTTPDLOAD=?	+HTTPDLOAD: <URL> OK
AT+HTTPDLOAD=<URL>	+HTTPDLOAD:<n> OK or CME ERROR:<err>

14.5.3 Field

URL target file path

n the size of file downloaded from URL

err error code

14.6 AT+HTTPREAD – Get HTTPDLOAD downloaded file content

14.6.1 Description

The command is used to get HTTPDLOAD downloaded file content.

14.6.2 Format

Command	Possible response(s)
---------	----------------------

AT+HTTPREAD =?	OK
AT+HTTPREAD	+HTTPREAD:<n> OK
AT+HTTPREAD=<StartAddress> [,<data length>]	+HTTPREAD:<n> OK/ ERROR

16.6.3 Field

StartAddress	The starting point for data output.
data length	The length for data output.
n	The actual length for data output.

15. FTP AT Command

15.1 AT+FTPPORT – Set FTP control port

15.1.1 Description

The command is used to set FTP Control Port

15.1.2 Format

Command	Possible response(s)
AT+FTPPORT?	+FTPPORT: <value> OK
AT+FTPPORT=?	OK
AT+FTPPORT=<value>	OK/ERROR/+CME ERROR: <err>
Example: AT+FTPPORT=2100	OK

15.1.3 Field

Value The value of FTP Control port, from 1 to 65535. Default value is 21.

15.2 AT+FTPMODE – Set active or passive FTP mode

15.2.1 Description

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

15.2.2 format

Command	Possible response(s)
AT+FTPMODE?	+ FTPMODE: <value> OK
AT+FTPMODE=?	OK
AT+FTPMODE=<value>	OK/ERROR/+CME ERROR: <err>

15.2.3 Field

Value	0	Active FTP mode
	1	Passive FTP mode

15.3 AT+FTPTYPE – Set the type of data to be transferred

15.3.1 Description

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

15.3.2 Format

Command	Possible response(s)
AT+FTPTYPE?	+ FTPTYPE: <value> OK
AT+FTPTYPE=?	OK
AT+FTPTYPE=<value>	OK/ERROR/+CME ERROR: <err>

15.3.3 Field

Value	"A"	For FTP ASCII sessions
	"I"	For FTP Binary sessions

15.4 AT+FTPPUTOPT – Set FTP put type

15.4.1 Description

The command is used to set FTP Put Type

15.4.2 Format

Command	Possible response(s)
AT+FTPPUTOPT?	+FTPPUTOPT: <value> OK
AT+FTPPUTOPT=?	OK
AT+FTPPUTOPT =<value>	OK/ERROR/+CME ERROR: <err>

15.4.3 Field

Value

- "APPE" For appending file
- "STOU" For storing unique file
- "STOR" For storing file

15.5 AT+FTPREST – Set resume broken download

15.5.1 Description

The command is used to set Resume Broken Download

15.5.2 Format

Command	Possible response(s)
AT+ FTPREST?	+ FTPREST: <value> OK

AT+ FTPREST=?	OK
AT+ FTPREST=<value>	OK/ERROR/+CME ERROR: <err>

15.5.3 Field

Value Broken point to be resumed, from 0 to 2147483647(byte)

15.6 AT+FTPSERV – Set FTP server address

15.6.1 Description

The command is used to set FTP Server Address

15.6.2 Format

Command	Possible response(s)
AT+FTPSERV?	+ FTPSERV: <value> OK
AT+ FTPSERV=?	OK
AT+ FTPSERV=<value>	OK/ERROR/+CME ERROR: <err>

15.6.3 Field

Value 32-bit number in dotted-decimal notation(i.e.xxx.xxx.xxx.xxx)

15.7 AT+FTPUN – Set FTP user name

15.7.1 Description

The command is used to set FTP User Name

15.7.2 Format

Command	Possible response(s)
---------	----------------------

AT+FTPUN?	+FTPUN: <value> OK
AT+FTPUN =?	OK
AT+FTPUN =<value>	OK/ERROR/+CME ERROR: <err>

15.7.3 Field

Value User Name.Alphanumeric ASCII text string up to 49 characters.

15.8 AT+FTPPW – Set FTP password

15.8.1 Description

The command is used to Set FTP Password

15.8.2 Format

Command	Possible response(s)
AT+FTPPW?	+FTPPW: <value> OK
AT+FTPPW =?	OK
AT+FTPPW =<value>	OK/ERROR/+CME ERROR: <err>

15.8.3 Field

Value User Password.Alphanumeric ASCII text string up to 49 characters.

15.9 AT+FTPGETNAME – Set download file name

15.9.1 Description

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

15.9.2 Format

Command	Possible response(s)
AT+FTPGETNAME?	FTPGETNAME: <value> OK
AT+FTPGETNAME=?	OK
AT+FTPGETNAME =<value>	OK/ERROR/+CME ERROR: <err>

15.9.3 Field

Value Download File Name. Alphanumeric ASCII text string up to 99 characters.

15.10 AT+FTPGETPATH – Set download file path

15.10.1 Description

The command is used to Set Download File Path

15.10.2 Format

Command	Possible response(s)
AT+FTPGETPATH?	+ FTPGETPATH: <value> OK
AT+FTPGETPATH=?	OK
AT+ FTPGETPATH =<value>	OK/ERROR/+CME ERROR: <err>

15.10.3 Field

Value Download File Path. Alphanumeric ASCII text string up to 255 characters.

15.11 AT+FTPPUTNAME – Set upload file name

15.11.1 Description

The command is used to set Upload File Name

15.11.2 Format

Command	Possible response(s)
AT+FTPPUTNAME?	+ FTTPUTNAME: <value> OK
AT+FTTPUTNAME=?	OK
AT+FTTPUTNAME =<value>	OK/ERROR/+CME ERROR: <err>

15.11.3 Field

Value Upload File Name. Alphanumeric ASCII text string up to 99 characters.

15.12 AT+FTTPUTPATH – Set upload file path

15.12.1 Description

The command is used to set Upload File Path

15.12.2 Format

Command	Possible response(s)
AT+FTTPUTPATH?	+ FTTPUTPATH: <value> OK
AT+FTTPUTPATH=?	OK
AT+FTTPUTPATH=<value>	OK/ERROR/+CME ERROR: <err>

15.12.3 Field

Value Upload File Path. Alphanumeric ASCII text string up to 255 characters.

15.13 AT+FTPGET – Download file

15.13.1 Description

The command is used to download File

15.13.2 Format

Command	Possible response(s)
AT+FTPGET=?	OK
AT+FTPGET=<mode>[,<value>]	<p>If mode is 1 and it is a successful FTP get session and data transfer finished:</p> <p>+FTPGET:1,<D_date length>;</p> <p>If mode is 1 and it is a failed FTP get session:</p> <p>+CME ERROR: <error></p> <p>If mode is 2 and get length of <value> data</p> <p>+FTPGET:2,<R_date length>;</p> <p>OK</p> <p>When no data to read,</p> <p>"+FTPGET:1,0" is shown.</p>
Reference	<p>Note:</p> <p>1.Max Response Time 15 seconds.</p>

15.13.3 Field

Mode	1 For opening FTP get session and download data.
	2 For reading FTP download data.
D_date length	The length of downloaded data
Value	Requested number of data bytes (1-1460) to be read

R_date length Confirmed number of data bytes to be read, which may be less than <value>.

15.14 AT+FTPPUT – Set upload file

15.14.1 Description

The command is used to set Upload File

15.14.2 Format

Command	Possible response(s)
AT+FTPPUT =?	+FTPPUT: 2,(1-1460) OK
AT+FTPPUT=2,<value>	+FTPPUT: 2,<value> OK/ERROR/+CME ERROR: <err>

15.14.3 Field

Value Requested number of data bytes(1-1460) to be transmitted.

15.15 AT+FTPDELE – Delete specified file in FTP server

15.15.1 Description

The command is used to delete Specified File in FTP Server

15.15.2 Format

Command	Possible response(s)
AT+ FTPDELE =?	OK
AT+FTPDELE	OK/ERROR/+CME ERROR: <err>

15.15.3 Note

The file to be deleted is specified by the "AT+FTPGETNAME" and "AT+FTPGETPATH" commands.

15.16 AT+FTPMKD – Make directory on the remote machine

15.16.1 Description

The command is used to make Directory on the Remote Machine

15.16.2 Format

Command	Possible response(s)
AT+FTPMKD=?	OK
AT+FTPMKD	OK/ERROR/+CME ERROR: <err>

15.16.3 Note

The created folder is specified by the “AT+FTPGETPATH” command

15.17 AT+FTPLIST – Set the type of data to be transferred

15.17.1 Description

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

15.17.2 Format

Command	Possible response(s)
AT+FTPLIST=?	OK

AT+FTPLIST	04-18-17 09:45AM 6144 00@@@#####\$.txt 04-11-17 05:52PM 2048 0404##@\$%.txt 04-11-17 04:13PM 8192 0411.txt 04-19-17 08:28PM 10 0413\$##@@!.txt 04-18-17 02:51PM 10 0831.txt 04-18-17 04:18PM 1024 10.txt 04-05-17 08:28PM 1360 103.txt 04-19-17 05:21PM 30 11.gif OK/ERROR/+CME ERROR: <err>
Reference	Note: 1.Max Response Time 60 seconds.

15.17.3 Note

The folder used to display the list is specified by the “AT+FTPGETPATH” command.

15.18 AT+FTPRMD – Remove directory on the remote machine

15.18.1 Description

The command is used to remove Directory on the Remote Machine

15.18.2 Format

Command	Possible response(s)
AT+FTPRMD=?	OK
AT+FTPRMD	OK/ERROR/+CME ERROR: <err>

15.18.3 Note

The removed folder is specified by the “AT+FTPGETPATH” command.

15.19 AT+FTPQUIT – Quit current FTP session

15.19.1 Description

The command is used to quit Current FTP Session

15.19.2 Format

Command	Possible response(s)
AT+FTPQUIT=?	OK
AT+FTPQUIT	OK/ERROR/+CME ERROR: <err>

15.20 AT+FTPGETOPS – Download file to file system

15.20.1 Description

The command is used to download file to file system.

15.20.2 Format

Command	Possible response(s)
AT+FTPGETOPS =?	OK
AT+FTPGETOPS=<destpath>,<source path>,<num>,<filename1>,<filename2>....	+FTPGETTOFS: <nid>,<filelen> OK/ERROR/+CME ERROR: <err>
Reference	Note: 1.Max Response Time 60 seconds.

15.20.3 Field

Destpath destination path

Soupath source path

Num	The number of files you need download.The max value is 5.
Filename	The file name you want to download
Nid	File download sequence number
Filelen	the length of the file

Example:

```
AT+FTPGETOFS="C:/","/sgj",1,"s1111.txt"
```

```
+FTPGETTOFS: 1,40
```

```
OK
```

15.21 AT+FTPSIZE – Get the Size of Specified File in FTP Server

15.21.1 Description

The command is used to get the size of specified file in FTP server.

15.21.2 Format

Command	Possible response(s)
AT+FTPSIZE=?	OK
AT+FTPSIZE?	+FTPSIZE: <PATH><NAME> OK
AT+ FTPSIZE	If succeeded: +FTPSIZE: 0,<size> OK If failed: +FTPSIZE: <errno>,0 OK

15.21.3 Field

PATH	Specified file path.
NAME	Specified file name.
Size	The file size.unit:byte.
Errno	error code.

15.22 AT+FTPGETFW – Get update package from FTP server.

15.22.1 Description

The command is used to Get update package from FTP server.

15.22.2 Format

Command	Possible response(s)
AT+FTPGETFW =?	OK
AT+FTPGETFW="IP",PORT,"username","password","path","filename",auto,process	If success,return: [+FW:<total>/<download num >/ <download percentage>] +FTPGETFW: <num> OK If fail,return: +CME ERROR: <errno>
Reference	Note: 1.Max Response Time 60 seconds.

15.21.3 Field

Ip	FTP server IP.
Port	FTP server port.
Username	FTP server username.
Password	FTP server password.
Path	The path of the file on FTP server.
Filename	The name of the file on FTP server.
Auto	if auto is 0,need to send AT+FOTAUPDATE,if auto is 1,will be automatically upgraded.
Process	if process is 1,will show the download process.if process is 0,will not show.
Num	Length of downloaded file.

16. FS AT Command

16.1 AT+MFSCD – Select directory as current directory

16.1.1 Description

The command is used to select directory as current directory.

16.1.2 Format

Command	Possible response(s)
AT+MFSCD=?	OK
AT+MFSCD?	+MFSCD: <curr_path> OK
AT+MFSCD=<path>	+MFSCD: <curr_path> OK/ERROR

16.1.3 Field

Path String without double quotes, directory for selection

Curr_path String without double quotes, current directory.

16.1.4 Note

If <path> is “..”, it will go back to previous level of directory. Maximum absolute path length 1011.

16.1.5 Example

```
AT+MFSCD=C:/test1/test2
```

```
+MFSCD: C:/test1/test2
```

OK

AT+MFSCD=..

+MFSCD: C:/test1

OK

AT+MFSCD=test2 Or AT+MFSCD=./test2

+MFSCD: C:/test1/test2

OK

16.2 AT+MFSMKD – Make new directory

16.2.1 Description

The command is used to make new directory.

16.2.2 Format

Command	Possible response(s)
AT+MFSMKD=?	OK
AT+MFSMKD=<dir>	OK/ERROR

16.2.3 Field

Dir String without double quotes, directory name which does not already exist

16.2.4 Note

Maximum length is 254, but if you include the path, up to 1011. Name string cannot contain: '/'.

16.2.5 Example

AT+MFSMKD=Test Or AT+MFSMKD=C:/Test

OK

AT+MFSLS=1

+MFSLS: DIRS:

Test

OK

16.3 AT+MFSLS– List directories/files in current directory

16.3.1 Description

The command is used to list directories/files in current directory.

16.3.2 Format

Command	Possible response(s)
AT+MFSLS=?	OK
AT+MFSLS?	+MFSLS: DIRS:<dir_num>FILES:<file_num> OK
AT+MFSLS	+MFSLS: DIRS: <list of subdirectories> <CR><LF> +MFSLS: FILES: <list of files> <CR><LF> OK
AT+MFSLS=<type>	[+MFSLS: DIRS: <list of subdirectories> <CR><LF>] [+MFSLS: FILES: <list of files> <CR><LF>] OK

16.3.3 Field

Type	0 – list both subdirectories and files 1 – list subdirectories only 2 – list files only
Dir_num	Integer type, the number of subdirectories in current directory.
File_num	Integer type, the number of files in current directory.

16.4 AT+MFSDELETE– Delete directory/file

16.4.1 Description

The command is used to delete directory/file.

16.4.2 Format

Command	Possible response(s)
AT+MFSDELETE =?	OK
AT+MFSDELETE =<dir>	OK/ERROR

16.4.3 Field

Dir String without double quotes, Directory name to be deleted which already exist.

16.4.4 Note

Maximum length is 254, but if you include the path, up to 1011.

16.4.5 Example

```

AT+MFSLS=1

+MFSLS: DIRS:

Test1
Test2

OK

AT+MFSDELETE=Test1 Or AT+MFSDELETE=C:/Test1
    
```

OK

AT+MFSLS=1

+MFSLS: DIRS:

Test2

OK

16.5 AT+MFSRENAME– Rename file/directory

16.5.1 Description

The command is used to rename file/directory.

16.5.2 Format

Command	Possible response(s)
AT+MFSRENAME =?	OK
AT+MFSRENAME=<old_name>,<new_name>	OK or ERROR

16.5.3 Field

Old_name String without double quotes, name which is existed.

New_name New name of specified file, string without double quotes.

16.5.4 Note

Maximum length is 254,but If you include the path, up to 1011.name string cannot contain: '/'.

16.5.5 Example

AT+MFSLS=1

+MFSLS: DIRS:

111

OK

AT+MFSRENAME=111, 222 Or AT+MFSRENAME=C:/111, 222

OK

AT+MFSLS=1

+MFSLS: DIRS:

222

OK

16.6 AT+MFSATTRI – Request file/directory attributes

16.6.1 Description

The command is used to request file/directory attributes.

16.6.2 Format

Command	Possible response(s)
AT+MFSATTRI=?	OK
AT+MFSATTRI=<name>	+MFSATTRI: <size>, <create_date>[,<DIR>] OK or ERROR

16.6.3 Field

Name String without double quotes, name which is existed.

Size The size of specified file/dir, and the unit is in Byte

Create_date

Create date and time of specified file, the format is YYYY/MM/DD HH:MM:SS Week.

Week – Mon, Tue, Wed, Thu, Fri, Sat, Sun

16.7 AT+MFSCREATE – Create a file

16.7.1 Description

The command is used to create a file.

16.7.2 Format

Command	Possible response(s)
AT+MFSCREATE=?	OK
AT+MFSCREATE=<name>	OK/ERROR

16.7.3 Field

Name String without double quotes, file name which does not already exist

16.7.4 Note

Maximum length is 254, but if you include the path, up to 1011. name string cannot contain: '/'.

16.7.5 Example

```
AT+MFSCREATE =Test.c Or AT+MFSCREATE =C:/Test.c
```

```
OK
```

```
AT+MFSL=2
```

```
+MFSL: FILES:
```

```
Test.c
```

```
OK
```

16.8 AT+MFSWRITE– Write content to the file

16.8.1 Description

The command is used to write content to the file.

16.8.2 Format

Command	Possible response(s)
AT+MFSWRITE=?	OK
AT+MFSWRITE=<name> ,<start_add>,<data_len>	OK/ERROR

16.8.3 Field

- Name** String without double quotes,file name which already exist
- Start_add** The address which start writing.The maximum value is 2147483647.
- Data_len** The length of content which you want to write.The maximum value is 1460.

16.8.4 Note

Start_add should be less than length of file.

16.8.5 Example

```
AT+MFSWRITE =Test.c,0,10 Or AT+MFSWRITE =C:/Test.c,0,10
OK
```

16.9 AT+MFSREAD– Read the contents from the file

16.9.1 Description

The command is used to read the contents from the file.

16.9.2 Format

Command	Possible response(s)
AT+MFSREAD=?	OK

AT+MFSREAD=<name> ,<start_add>,<data_len>	+MFSREAD: <real_len> OK or ERROR
--	--

16.9.3 Field

- Name** String without double quotes,file name which already exist
- Start_add** The address which start reading.The maximum value is 2147483647.
- Data_len** The length of content which you want to read.The maximum value is 1024.
- Real_len** The length of content actually read.

16.9.4 Note

Start_add should be less than length of file.If data_len is 0,will read,the entire file content will be obtained

16.9.5 Example

```
AT+MFSREAD=Test.c,0,0 Or AT+MFSREAD=C:/Test.c,0,0
OK
```

16.10 AT+MFSCOPY– Copy an appointed file

16.10.1 Description

The command is used to copy an appointed file.

16.10.2 Format

Command	Possible response(s)
AT+MFSCOPY=?	OK
AT+MFSCOPY=<file1>,<file2>	+MFSCOPY: END OK or ERROR

16.10.3 Field

File1 The sources file name or the whole path name with sources file name.

File2 The destination file name or the whole path name with destination file name.

16.10.4 Note

Maximum length is 254, but if you include the path, up to 1011. Name string cannot contain: '/'.

16.10.5 Example

```
AT+MFSCOPY=Test1.c,Test2.c Or AT+MFSCOPY=C:/Test1.c,Test2.c
OK
```

16.11 AT+MFSMEM– Check the size of available memory

16.11.1 Description

The command is used to check the size of available memory.

16.11.2 Format

Command	Possible response(s)
AT+MFSMEM=?	OK
AT+MFSMEM	+MFSMEM: C:(<total>, <available>) OK/ERROR

16.11.3 Field

Total The total size of local storage space.

Available The available size of local storage space.

16.11.4 Note

The unit of storage space size is in Byte.

16.12 AT+MFSLOCA– Select storage place

16.12.1 Description

The command is used to select storage place.

16.12.2 Format

Command	Possible response(s)
AT+MFSLOCA=?	+MFSLOCA: (0-1) OK
AT+MFSLOCA?	+MFSLOCA: <loca> OK
AT+MFSLOCA =<loca>	OK/ERROR

16.12.3 Field

Loca 0 store media files to local storage space (namely “C:/”)

 1 store media files to external storage space (namely “SD:/”)

16.13 AT+MFSTM– Set/Get current system time

16.13.1 Description

The command is used to set or get current system time.

16.13.2 Format

Command	Possible response(s)
AT+MFSTM=?	OK
AT+MFSTM	<cur_time> OK
AT+MFSTM =<time>	OK/ERROR

16.13.3 Field

Time Internal current system time you want to set. The format is MM/DD/YYYY-HH:MM: SS.

Cur_time Internal current system time. The format is Week MM/DD/YYYY HH:MM: SS.

16.11.4 Note

The maximum date is December 31, 2037, 23:59:59.

17. SSL AT Command

17.1 AT+CIPSSL– Set TCP SSL function

17.1.1 Description

The command is used to set tcp ssl function.

17.1.2 Format

Command	Possible response(s)
AT+CIPSSL=?	OK
In multiple ip connection AT+CIPSSL=<id>,<on/off>	OK
In single ip connection AT+CIPSSL=<on/off>	OK
AT+CIPSSL?	In multiple ip connection +CIPSSL=<id>,<on/off> OK In single ip connection +CIPSSL=<on/off> OK

17.1.3 Field

<on/off>

- 0 turn off SSL function
- 1 turn on SSL function

17.1.4 Example

In muti-link mode:

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

In single link mode:

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

17.2 AT+HTTPSSL– Set HTTP SSL function

17.2.1 Description

The command is used to set http ssl function.

17.2.2 Format

Command	Possible response(s)
AT+ HTTPSSL =?	OK
AT+ HTTPSSL =<on/off>	OK
AT+ HTTPSSL?	+ HTTPSSL =<on/off> OK

17.2.3 Field

<on/off>

- 0 turn off SSL function
- 1 turn on SSL function

17.2.4 Example

AT+HTTPPARA=URL,"www.baidu.com"	OK
AT+HTTPPARA=PORT,443	OK
AT+HTTPSSL=1	OK
AT+HTTPSETUP	OK
AT+HTTPACTION=0	OK

18. FOTA AT Command

18.1 AT+FOTACHECK – Check if there is an update package

18.1.1 Description

The command is used to check if there is an update package.

18.1.2 Format

Command	Possible response(s)
AT+FOTACHECK =?	OK
AT+FOTACHECK	Send a check request to the default server. If there is an update package,return: NEW VERSION OK If there is no update package,return: OK If there are some errors,return: +CME ERROR: <errno>

AT+FOTACHECK =<URL>	Send a check request to <URL>. If there is an update package,return: NEW VERSION OK If there is no update package,return: OK If there are some errors,return: +CME ERROR: <Errno>
---------------------	--

18.1.3 Field

URL The server(IP/Domain) that handles the check request.

Errno Error code.

18.2 AT+FOTADLOAD – Download an update package

18.2.1 Description

The command is used to download an update package.

18.2.2 Format

Command	Possible response(s)
AT+FOTADLOAD=?	OK

AT+FOTADLOAD	+ FOTADLOAD: [0.0%] + FOTADLOAD: [100.0%] DOWNLOAD OK If there are some errors,return: +CME ERROR: <errno>
--------------	---

18.3 AT+FOTAUPDATE – Make upgrade related settings and restart upgrade

18.3.1 Description

The command is used to make upgrade related settings and restart upgrade.

18.3.2 Format

Command	Possible response(s)
AT+ FOTAUPDATE =?	OK
AT+ FOTAUPDATE	OK If there are some errors,return: +CME ERROR: <errno>

18.4 AT+FOTAREPORT – Inform the server that the upgrade was successful

18.4.1 Description

The command is used to inform the server that the upgrade was successful.

18.4.2 Format

Command	Possible response(s)
AT+ FOTAREPORT =?	OK
AT+ FOTAREPORT	REPORT OK If there are some errors,return: +CME ERROR: <errno>

19. Appendix I

TCPIP error code,except CSTT CIICR CIPSHUT.FS error code

errno 6001 : unknown host

errno 330: TCPIP initing

errno 331: cipstart executing

errno 340:tcp/udp send data time out

errno 348:no such tcp/udp link

errno 349:tcp/udp link exits

errno 350: cipmux is not correct/Parameter problem

errno0:Success

errno1:Operation not permitted

errno 2: No such file or directory

errno 3: No such process

errno 4:Interrupted system call

errno 5: Input/output error

errno6 : No such device or address

errno7 : Argument list too long

errno8 : Exec format error

errno9 : Bad file descriptor

errno10 : No child processes

errno11 : Resource temporarily unavailable

errno12 : Cannot allocate memory

errno13 :Permission denied

errno14 : Bad address

errno15 : Block device required

errno16 : Device or resource busy

errno17 : File exists

errno18 : Invalid cross-device link

errno19 : No such device

errno20 : Not a directory

errno21 : Is a directory

errno22 : Invalid argument

errno23 : Too many open files in system

errno24 : Too many open files

errno25 : Inappropriate ioctl for device

errno26 : Text file busy

errno27 :File too large

errno28 :No space left on device

errno29 : Illegal seek

errno30 : Read-only file system

errno31 : Too many links

errno32 : Broken pipe

errno33 : Numerical argument out of domain

errno34 : Numerical result out of range

errno35 :Resource deadlock avoided

errno36 : File name too long

errno37 : No locks available

errno38 : Function not implemented

errno39 : Directory not empty

errno40 : Too many levels of symbolic links

errno41 : Unknown error 41

errno42 : No message of desired type

errno43 : Identifier removed

errno44 :Channel number out of range

errno45 : Level 2 not synchronized

errno46 : Level 3 halted

errno47 : Level 3 reset

errno48 :Link number out of range

errno49 : Protocol driver not attached

errno50 : No CSI structure available

errno51 : Level 2 halted

errno52 : Invalid exchange

errno53 : Invalid request descriptor

errno54 : Exchange full

errno55 :No anode

errno56 :Invalid request code

errno57 : Invalid slot

errno58 : Unknown error 58

errno59 : Bad font file format

errno60 : Device not a stream

errno61 : No data available

errno62 : Timer expired

errno63 :Out of streams resources

errno64 : Machine is not on the network

errno65 : Package not installed

errno66 : Object is remote

errno67 : Link has been severed

errno68 : Advertise error

errno69 :Srmount error

errno70 : Communication error on send

errno71 : Protocol error

errno72 :Multihop attempted

errno73 : RFS specific error

errno74 : Bad message

errno75: Value too large for defined datatype

errno76: Name not unique on network

errno77: File descriptor in bad state

errno78: Remote address changed

errno79: Can not access a needed sharedlibrary

errno80: Accessing a corrupted sharedlibrary

errno81: lib section in a.out corrupted

errno82: Attempting to link in too many shared libraries

errno83: Cannot exec a shared library directly

errno84: Invalid or incomplete multibyte or wide character

errno85: Interrupted system call should be restarted

errno86: Streams pipe error

errno87: Too many users

errno88: Socket operation on non-socket

errno89: Destination address required

errno90: Message too long

errno91: Protocol wrong type for socket

errno92: Protocol not available

errno93: Protocol not supported

errno94: Socket type not supported

errno95: Operation not supported

errno96: Protocol family not supported

errno97: Address family not supported by protocol

errno98: Address already in use

errno99: Cannot assign requested address

errno100: Network is down

errno101: Network is unreachable

errno102: Network dropped connection on reset

errno103: Software caused connection abort

errno104: Connection reset by peer

errno105: No buffer space available

errno106: Transport endpoint is already connected

errno107: Transport endpoint is not connected

errno108: Cannot send after transport endpoint shutdown

errno109: Too many references: cannot splice

errno110: Connection timed out

errno111: Connection refused

errno112: Host is down

errno113: No route to host

errno114: Operation already in progress

errno115: Operation now in progress

errno116: Stale NFS file handle

errno117: Structure needs cleaning

errno118: Not a XENIX named type file

errno119: No XENIX semaphores available

errno120: Is a named type file

errno121: Remote I/O error

errno122: Disk quota exceeded

errno123: No medium found

errno124: Wrong medium type

errno125: Operation canceled

errno126: Required key not available

errno127: Key has expired

errno128: Key has been revoked

errno129: Key was rejected by service

errno130: Owner died

errno131: State not recoverable

errno132: Operation not possible due to RF-kill

20. Appendix II

FTP error code.AndHTTPDLOAD error code.

CURLE_OK (0)

All fine. Proceed as usual.

CURLE_UNSUPPORTED_PROTOCOL (1)

The URL you passed to libcurl used a protocol that this libcurl does not support. The support might be a compile-time option that you didn't use, it can be a misspelled protocol string or just a protocol libcurl has no code for.

CURLE_FAILED_INIT (2)

Very early initialization code failed. This is likely to be an internal error or problem, or a resource problem where something fundamental couldn't get done at init time.

CURLE_URL_MALFORMAT (3)

The URL was not properly formatted.

CURLE_NOT_BUILT_IN (4)

A requested feature, protocol or option was not found built-in in this libcurl due to a build-time decision. This means that a feature or option was not enabled or explicitly disabled when libcurl was built and in order to get it to function you have to get a rebuilt libcurl.

CURLE_COULDNT_RESOLVE_PROXY (5)

Couldn't resolve proxy. The given proxy host could not be resolved.

CURLE_COULDNT_RESOLVE_HOST (6)

Couldn't resolve host. The given remote host was not resolved.

CURLE_COULDNT_CONNECT (7)

Failed to connect() to host or proxy.

CURLE_FTP_WEIRD_SERVER_REPLY (8)

The server sent data libcurl couldn't parse. This error code is used for more than just FTP and is aliased as CURLE_WEIRD_SERVER_REPLY since 7.51.0.

CURLE_REMOTE_ACCESS_DENIED (9)

We were denied access to the resource given in the URL. For FTP, this occurs while trying to change to the remote directory.

CURLE_FTP_ACCEPT_FAILED (10)

While waiting for the server to connect back when an active FTP session is used, an error code was sent over the control connection or similar.

CURLE_FTP_WEIRD_PASS_REPLY (11)

After having sent the FTP password to the server, libcurl expects a proper reply. This error code indicates that an unexpected code was returned.

CURLE_FTP_ACCEPT_TIMEOUT (12)

During an active FTP session while waiting for the server to connect, the CURLOPT_ACCEPTTIMEOUT_MS (or the internal default) timeout expired.

CURLE_FTP_WEIRD_PASV_REPLY (13)

libcurl failed to get a sensible result back from the server as a response to either a PASV or a EPSV command. The server is flawed.

CURLE_FTP_WEIRD_227_FORMAT (14)

FTP servers return a 227-line as a response to a PASV command. If libcurl fails to parse that line, this return code is passed back.

CURLE_FTP_CANT_GET_HOST (15)

An internal failure to lookup the host used for the new connection.

CURLE_HTTP2 (16)

A problem was detected in the HTTP2 framing layer. This is somewhat generic and can be one out of several problems, see the error buffer for details.

CURLE_FTP_COULDNT_SET_TYPE (17)

Received an error when trying to set the transfer mode to binary or ASCII.

CURLE_PARTIAL_FILE (18)

A file transfer was shorter or larger than expected. This happens when the server first reports an expected transfer size, and then delivers data that doesn't match the previously given size.

CURLE_FTP_COULDNT_RETR_FILE (19)

This was either a weird reply to a 'RETR' command or a zero byte transfer complete.

CURLE_QUOTE_ERROR (21)

When sending custom "QUOTE" commands to the remote server, one of the commands returned an error code that was 400 or higher (for FTP) or otherwise indicated unsuccessful completion of the command.

CURLE_HTTP_RETURNED_ERROR (22)

This is returned if CURLOPT_FAILONERROR is set TRUE and the HTTP server returns an error code that is ≥ 400 .

CURLE_WRITE_ERROR (23)

An error occurred when writing received data to a local file, or an error was returned to libcurl from a write callback.

CURLE_UPLOAD_FAILED (25)

Failed starting the upload. For FTP, the server typically denied the STOR command. The error buffer usually contains the server's explanation for this.

CURLE_READ_ERROR (26)

There was a problem reading a local file or an error returned by the read callback.

CURLE_OUT_OF_MEMORY (27)

A memory allocation request failed. This is serious badness and things are severely screwed up if this ever occurs.

CURLE_OPERATION_TIMEDOUT (28)

Operation timeout. The specified time-out period was reached according to the conditions.

CURLE_FTP_PORT_FAILED (30)

The FTP PORT command returned error. This mostly happens when you haven't specified a good enough address for libcurl to use. See CURLOPT_FTPPORT.

CURLE_FTP_COULDNT_USE_REST (31)

The FTP REST command returned error. This should never happen if the server is sane.

CURLE_RANGE_ERROR (33)

The server does not support or accept range requests.

CURLE_HTTP_POST_ERROR (34)

This is an odd error that mainly occurs due to internal confusion.

CURLE_SSL_CONNECT_ERROR (35)

A problem occurred somewhere in the SSL/TLS handshake. You really want the error buffer and read the message there as it pinpoints the problem slightly more. Could be certificates (file formats, paths, permissions), passwords, and others.

CURLE_BAD_DOWNLOAD_RESUME (36)

The download could not be resumed because the specified offset was out of the file boundary.

CURLE_FILE_COULDNT_READ_FILE (37)

A file given with FILE:// couldn't be opened. Most likely because the file path doesn't identify an existing file. Did you check file permissions?

CURLE_LDAP_CANNOT_BIND (38)

LDAP cannot bind. LDAP bind operation failed.

CURLE_LDAP_SEARCH_FAILED (39)

LDAP search failed.

CURLE_FUNCTION_NOT_FOUND (41)

Function not found. A required zlib function was not found.

CURLE_ABORTED_BY_CALLBACK (42)

Aborted by callback. A callback returned "abort" to libcurl.

CURLE_BAD_FUNCTION_ARGUMENT (43)

Internal error. A function was called with a bad parameter.

CURLE_INTERFACE_FAILED (45)

Interface error. A specified outgoing interface could not be used. Set which interface to use for outgoing connections' source IP address with CURLOPT_INTERFACE.

CURLE_TOO_MANY_REDIRECTS (47)

Too many redirects. When following redirects, libcurl hit the maximum amount. Set your limit with CURLOPT_MAXREDIRS.

CURLE_UNKNOWN_OPTION (48)

An option passed to libcurl is not recognized/known. Refer to the appropriate documentation. This is most likely a problem in the program that uses libcurl. The error buffer might contain more specific information about which exact option it concerns.

CURLE_TELNET_OPTION_SYNTAX (49)

A telnet option string was illegally formatted.

CURLE_PEER_FAILED_VERIFICATION (51)

The remote server's SSL certificate or SSH md5 fingerprint was deemed not OK.

CURLE_GOT_NOTHING (52)

Nothing was returned from the server, and under the circumstances, getting nothing is considered an error.

CURLE_SSL_ENGINE_NOTFOUND (53)

The specified crypto engine wasn't found.

CURLE_SSL_ENGINE_SETFAILED (54)

Failed setting the selected SSL crypto engine as default!

CURLE_SEND_ERROR (55)

Failed sending network data.

CURLE_RECV_ERROR (56)

Failure with receiving network data.

CURLE_SSL_CERTPROBLEM (58)

problem with the local client certificate.

CURLE_SSL_CIPHER (59)

Couldn't use specified cipher.

CURLE_SSL_CACERT (60)

Peer certificate cannot be authenticated with known CA certificates.

CURLE_BAD_CONTENT_ENCODING (61)

Unrecognized transfer encoding.

CURLE_LDAP_INVALID_URL (62)

Invalid LDAP URL.

CURLE_FILESIZE_EXCEEDED (63)

Maximum file size exceeded.

CURLE_USE_SSL_FAILED (64)

Requested FTP SSL level failed.

CURLE_SEND_FAIL_REWIND (65)

When doing a send operation curl had to rewind the data to retransmit, but the rewinding operation failed.

CURLE_SSL_ENGINE_INITFAILED (66)

Initiating the SSL Engine failed.

CURLE_LOGIN_DENIED (67)

The remote server denied curl to login (Added in 7.13.1)

CURLE_TFTP_NOTFOUND (68)

File not found on TFTP server.

CURLE_TFTP_PERM (69)

Permission problem on TFTP server.

CURLE_REMOTE_DISK_FULL (70)

Out of disk space on the server.

CURLE_TFTP_ILLEGAL (71)

Illegal TFTP operation.

CURLE_TFTP_UNKNOWNID (72)

Unknown TFTP transfer ID.

CURLE_REMOTE_FILE_EXISTS (73)

File already exists and will not be overwritten.

CURLE_TFTP_NOSUCHUSER (74)

This error should never be returned by a properly functioning TFTP server.

CURLE_CONV_FAILED (75)

Character conversion failed.

CURLE_CONV_REQD (76)

Caller must register conversion callbacks.

CURLE_SSL_CACERT_BADFILE (77)

Problem with reading the SSL CA cert (path? access rights?)

CURLE_REMOTE_FILE_NOT_FOUND (78)

The resource referenced in the URL does not exist.

CURLE_SSH (79)

An unspecified error occurred during the SSH session.

CURLE_SSL_SHUTDOWN_FAILED (80)

Failed to shut down the SSL connection.

CURLE_AGAIN (81)

Socket is not ready for send/rcv wait till it's ready and try again. This return code is only returned from curl_easy_recv and curl_easy_send

CURLE_SSL_CRL_BADFILE (82)

Failed to load CRL file

CURLE_SSL_ISSUER_ERROR (83)

Issuer check failed

CURLE_FTP_PRET_FAILED (84)

The FTP server does not understand the PRET command at all or does not support the given argument. Be careful when using CURLOPT_CUSTOMREQUEST, a custom LIST command will be sent with PRET CMD before PASV as well.

CURLE_RTSP_CSEQ_ERROR (85)

Mismatch of RTSP CSeq numbers.

CURLE_RTSP_SESSION_ERROR (86)

Mismatch of RTSP Session Identifiers.

CURLE_FTP_BAD_FILE_LIST (87)

Unable to parse FTP file list (during FTP wildcard downloading).

CURLE_CHUNK_FAILED (88)

Chunk callback reported error.

CURLE_NO_CONNECTION_AVAILABLE (89)

(For internal use only, will never be returned by libcurl) No connection available, the session will be queued.

CURLE_SSL_PINNEDPUBKEYNOTMATCH (90)

Failed to match the pinned key specified with CURLOPT_PINNEDPUBLICKEY.

CURLE_SSL_INVALIDCERTSTATUS (91)

Status returned failure when asked with CURLOPT_SSL_VERIFYSTATUS.

CURLE_HTTP2_STREAM (92)

Stream error in the HTTP/2 framing layer.

CURLE_OBSOLETE*

These error codes will never be returned. They were used in an old libcurl version and are currently unused.