

CRANE

AT Command Interface

User Manual

V1.8

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About This Document

1.1 Purpose

This document describes the AT commands supported by AT command server. Standard AT commands are defined in 3GPP TS 27.007, 3GPP TS 27.005 and ITU-T Recommendation V.250. Others are defined privately by ASR as well.

1.2 Product/Sub-Product Overview

AT commands are interfaces between RIL and AT command Server and are handled by AT command server.

1.3 Document Structure

Table 1: Document Structure

This document contains the following chapters:

Section	Description
<u>About This Document</u>	This section describes the purpose, scope and structure of the document, lists acronyms used, and referenced and background documents.
<u>AT Command Interface</u>	A description of the AT Command interface

1.4 Referenced Documents

Table 2: Related Documentation

Ref #	Document Name	Doc Number	Revision
	Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)	3GPP TS 27.005	5.0.1
	AT command set for User Equipment (UE)	3GPP TS 27.007	V12.1.0
	Serial asynchronous automatic dialing and control	ITU-T Recommendation V.250	N/A

2

Definitions and Abbreviations

2.1 Definitions

For the purposes of the present document, the following syntactical definitions apply:

- | | |
|-------|---|
| <CR> | Carriage return character, which value is specified with command S3. |
| <LF> | Linefeed character, which value is specified with command S4. |
| <...> | Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line. |
| [...] | Optional subparameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in <i>parameter type</i> commands, new value equals to its previous value. In <i>action type</i> commands, action should be done on the basis of the recommended default setting of the subparameter. |

2.2 Abbreviations

AT	ATtention; this two-character abbreviation is always used to start a command line to be sent from TE to TA
DCE	Data Circuit terminating Equipment
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual-Tone Multi-Frequency
DTR	Data Terminal Ready
DUT	Device Under Test
IMEI	International Mobile station Equipment Identity
IRA	International Reference Alphabet (ITU-T T.50)
ME	Mobile Equipment
MEP	Mobile Equipment Personalization
MRD	Factory
MO	Mobile Original
MT	Mobile Termination
PDP	Packet Data Protocol
RD	Reliable Data
SIM	Subscriber Identity Module
SN	Serial Number
TA	Terminal Adaptor, e.g. a GSM data card (equal to DCE; Data Circuit terminating Equipment)
TE	Terminal Equipment, e.g. a computer (equal to DTE; Data Terminal Equipment)
TIA	Telecommunications Industry Association
UE	User Equipment
UICC	Universal Integrated Circuit Card
USIM	Universal Subscriber Identity Module
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service

3 AT Command Interface

3.1 Summary of AT Commands Supported by AT Command Server

Table 3: Summary of AT Commands

Primitives	Category	Quick Description
ATS0	S-Register command	Set the automatic answering delay
ATS3	S-Register command	Set the Carriage Return character
ATS4	S-Register command	Set the Line Feed character
ATS5	S-Register command	Set the Backspace character
ATE	Basic command	Set whether or not the modem echoes characters
ATI	Basic command	Request manufacturer specific information about the TA
ATQ	Basic command	Determines whether the mobile equipment sends result codes or not
ATV	Basic command	Set TA response format
ATX	Basic command	Defines CONNECT result code format
ATZ	Basic command	Restores the configuration profile
AT&F	Basic command	Reloads the factory-stored default configurations
AT&Z	Basic command	Stores a telephone number into the modems telephone directory
AT+CMEE	General command	Report Mobile Termination error
AT+CGMI	General command	Return information of manufacturer
AT+CGMM	General command	Return information of model

Primitives	Category	Quick Description
AT+CGMR	General command	Return information of revision
AT*CGMR	General command	Return information of revision and build time
AT+CGSN	General command	Return information of serial number
AT*CGSN	General command	This proprietary AT command is used to read/update SVN of IMEISV.
AT+CSCS	General command	Informs TA which character set is used by the TE
AT+CIMI	General command	Causes the TA to return IMSI
AT+ASTO	General command	Save/fetch dial-string
AT+GMI	General command	Return information of the name of the manufacturer
AT+GMM	General command	Return information of the name of the product
AT+GMR	General command	Return information of the software version of the product
AT+GSN	General command	Return information of a manufacturer determined alpha-numeric string
AT^HVER	General command	Return information of the hardware version of the product
AT+GCAP	General command	Return a list of additional capabilities command
AT+CLAC	General command	Return all available AT Commands.
AT+CCLK	General command	Set or get real-time clock of the MT.
ATA	Call control command	Answer an incoming call
ATD	Call control command	Start an original call
AT*DIALE	Call control command	This proprietary AT command is used to make an emergency call.
AT+CDU	Call control command	Start an original call with URI address.
ATH	Call control command	Hang up a call

Primitives	Category	Quick Description
AT+ECHUPVT	Call control command	The execution command is used to hang up all connecting or connected CS calls.
AT+CBST	Call control command	Set the bearer service name and data rate
AT+CVHU	Call control command	Set whether ATH or "drop DTR" shall cause a voice connection to be disconnected or not
AT+CRLP	Call control command	Set Radio link protocol parameters
AT+CMUT	Call control command	Enable and disable the uplink voice muting during a voice call
AT+CHUP	Call control command	Causes the TA to hang-up the current UMTS call of the MT
AT+CSTA	Call control command	Selects the type of number for further dialing commands (D)
AT+CRC	Call control command	Controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation or notification for VBS/VGCS calls is used
AT+DS	Call control command	Controls ITU T Recommendation V.42bis data compression functions
AT+CEER	Call control command	Causes the TA to return one or more lines of information text of result report
AT*CISCC	Call control command	Notify CP the call state maintained by IMS stack in SRVCC procedures
AT+CREG	Network service related command	Controls the presentation of an unsolicited result for network registration status change
AT+CIND	Network service related command	Set the values of MT indicators
AT+COPS	Network service related command	Select and register the UMTS network operator
AT+CPOL	Network service related command	Edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC
AT+CLK	Network service related command	Lock, unlock or interrogate a MT or a network facility
AT+CPWD	Network service related command	Sets a new password for the facility lock function

Primitives	Category	Quick Description
AT+CLIP	Network service related command	Enables a called subscriber to get the calling line identity
AT+CLIR	Network service related command	Enable or disable the presentation of the CLI to the called party when originating a call
AT+COLP	Network service related command	Enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call
AT+COLR	Network service related command	Interrogation of the CoLR Service support.
AT+CNAP	Network service related command	Requests status information for the CNAP (Calling Name Presentation) Supplementary Service
AT+CCFC	Network service related command	Control of the call forwarding supplementary service according to 3GPP TS 22.082
AT+CCWA	Network service related command	Control of the Call Waiting supplementary service
AT+CHLD	Network service related command	Control of a calls can be put on hold, recovered, released, added to conversation, and transferred
AT+CUSD	Network service related command	Control of the Unstructured Supplementary Service Data (USSD)
AT+CAOC	Network service related command	Enables subscriber to get information about the cost of calls
AT+VTS	Network service related command	Allows the transmission of DTMF tones and arbitrary tones
AT\$VTS	Network service related command	Transmission of DTMF tones and user decided DTMF sound play duration
AT+VTD	Network service related command	Defines the length of tones emitted as a result of the +VTS command
AT+CSSN	Network service related command	Refers to supplementary service related network initiated notifications
AT+CLCC	Network service related command	Returns list of current calls of MT

Primitives	Category	Quick Description
AT+PEER	Network service related command	Requests the failure cause code for the most recently failed PDP context activate
AT+CNUM	Network service related command	Returns the MSISDNs related to the subscriber
AT+CSQ	Network service related command	Returns received signal strength indication <rss> and channel bit error rate from the MT
AT+CDIP	Network service related command	Enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call
AT+CPLS	Network service related command	Selection of preferred PLMN list
AT+COPN	Network service related command	returns the operator name
AT*BAND	Network service related command	Set band mode
AT*EHSDPA	Network service related command	This command is used to enable/disable HSDPA and HSUPA.
AT^SYSINFO	Network service related command	This command is used to query current system information
AT*REJCAUSE	Network service related command	This proprietary AT command is used to enable/disable/query air interface reject cause indication
AT*CellLock	Network service related command	This proprietary AT command is used to requests to activate or to deactivate cell lock for TD/LTE network.
AT*Cell	Network service related command	This proprietary AT command is used to requests to activate or to deactivate cell lock for GSM/WCDMA network
AT+CTZR	Network service related command	Enables and disables the time zone change event reporting
AT+CNEM	Network service related command	Enables and disables reporting of changes in the emergency bearer services support indicators
AT+CSSAC	Network service related command	The command provides the current status of the parameters for SSAC (Service Specific Access Control)

Primitives	Category	Quick Description
AT+CTZU	Network service related command	Enables and disables automatic time zone update via NITZ
AT*CTZR	Network service related command	This proprietary AT command is used to query time zone information.
AT+CESQ	Network service related command	Returns received signal strength indication, channel bit error rate, received signal code power, ratio of energy per chip to noise specific density, reference signal receiving quality and,reference signal receive power from the MT.
AT+BGLTEPLMN	Network service related command	Set cell background searching.
AT^CACAP	Network service related command	Get the access technology of the serving cell.
AT^SYSCONFIG	Network service related command	Set the system mode, G/W access order, roaming support and domain characteristics.
AT+WS46	Network service related command	select the cellular network (Wireless Data Service; WDS) to operate with the TA
AT*CSQ	Network service related command	This proprietary AT command is used to configure the unsolicited signal quality indications mode.
AT*URSLCT	Network service related command	trigger user PLMN selection.
AT+CPAS	Mobile control and status command	Returns the activity status of the MT
AT+CFUN	Mobile control and status command	Selects the level of functionality in the MT
AT*CFUN	Mobile control and status command	Set phone functionality status
AT+OFF	Mobile control and status command	This proprietary AT command is used to make device in minimum functionality but without IMSI detach.
AT+CPIN	Mobile control and status command	Sends to the MT a password which is necessary before it can be operated

Primitives	Category	Quick Description
AT+CPIN2	Mobile control and status command	Verify PIN2 anytime after PIN ready not only in the case that PIN2 is required.
AT+EPIN	Mobile control and status command	Get Pin state
AT+CPBS	Mobile control and status command	Selects phonebook memory storage
AT+CPBR	Mobile control and status command	Returns phonebook entries in location number range
AT+CPBW	Mobile control and status command	Writes phonebook entry in location number
AT+CPBF	Mobile control and status command	Returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field start with specific string
AT*CPBC	Mobile control and status command	This proprietary AT command is used to read the SIM/USIM phonebook capabilities supported by the selected phonebook.
AT*FDNBYPASS	Mobile control and status command	This proprietary AT command is used to bypass FDN check only once for MO call/SMS.
AT+CSIM	Mobile control and status command	Transmits to the MT the SIM command it then shall send as it is to the SIM
AT+CRSM	Mobile control and status command	Transmits to the MT the SIM command and its required parameters
AT+CACM	Mobile control and status command	Resets the Advice of Charge related accumulated call meter value in SIM card or in the active application in the UICC (GSM or USIM) file EFACM
AT+CAMM	Mobile control and status command	Sets the Advice of Charge related accumulated call meter maximum value in SIM card or in the active application in the UICC (GSM or USIM) file EFACMmax
AT+CPUC	Mobile control and status command	Sets the parameters of Advice of Charge related price per unit and currency table in SIM card or in the active application in the UICC (GSM or USIM) file EFPUCT.
AT+CCWE	Mobile control and status command	Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command.
AT*SIMDETEC	Mobile control and status command	Detect the sim in specified slot was removed or not.

Primitives	Category	Quick Description
AT+ERGA	Mobile control and status command	This command is used to implement “RUN GSM ALGORITHM” in SIM
AT+ERTCA	Mobile control and status command	This command is used to implement 3G Context authentication mechanism in USIM
AT+MSTK	Mobile control and status command	Services related to SIM Toolkit
AT*ENVSIM	Mobile control and status command	Enable Virtual SIM
AT*EUICC	Mobile control and status command	Get the SIM card type.
AT+CGLA	Mobile control and status command	This command allows a direct control of the currently selected UICC by a distant application on the TE.
AT+CRLA	Mobile control and status command	This command allows a direct control of the currently selected UICC by a distant application on the TE. It has easier but more limited access to the UICC database compared to AT+CGLA
AT+CCHO	Mobile control and status command	This command let currently selected UICC will open a new logical channel
AT+CCHC	Mobile control and status command	This command let ME close the previously opened logical channel
AT*GRIP	Mobile control and status command	This command asks the MT to power back off when people nearby to reduce radiation for people.
AT*COMCFG	Mobile control and status command	This command used to configure the info of MT.
AT*APCFG	Mobile control and status command	notify some AP configurations to CP
AT+VZWRSRP	Mobile control and status command	Returns the RSRP values for all cells which the UE is measuring
AT+VZWRSRQ	Mobile control and status command	Returns the RSRQ values for all cells which the UE is measuring
AT*GATR	Mobile control and status command	This command used to get some UICC information

Primitives	Category	Quick Description
AT+CEN	Mobile control and status command	This command allows for reading and dynamical reporting of emergency numbers as received from the network
AT+CISRVCC	Mobile control and status command	Informs MT about the SRVCC Support.
AT+CAVIMS	Mobile control and status command	Informs the MT whether the UE is currently available for voice calls with the IMS
AT+CASIMS	Mobile control and status command	Informs the MT whether the UE is currently available for SMS using IMS
AT+CIREP	Mobile control and status command	Enables or disables reporting of SRVCC, vSRVCC handover information and CS to PS Single Radio Voice Call Continuity and of IMS Voice Over PS sessions (IMSVOPS) indicator information
AT*ISIMAID	Mobile control and status command	Queries ISIM AID. If ISIM exists, this command will return the ISIM application ID, otherwise return empty string
AT+CGREG	Packet domain command	Controls the presentation of an unsolicited result for package network registration status
AT+CIREG	Packet domain command	Controls the presentation of an unsolicited result for IMS registration status
AT+CGATT	Packet domain command	Attach the MT to, or detach the MT from, the Packet Domain service
AT+CGACT	Packet domain command	Activate or deactivate the specified PDP context (s)
AT+CGDATA	Packet domain command	Perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types
AT+CGDCONT	Packet domain command	Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>
AT+CGDSCONT	Packet domain command	Specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>
AT+CGQMIN	Packet domain command	Allows the TE to specify a minimum acceptable profile
AT+CGQREQ	Packet domain command	Specify a Quality of Service Profile
AT+CGEQREQ	Packet domain command	Specify a UMTS Quality of Service Profile

Primitives	Category	Quick Description
AT+CGEQMIN	Packet domain command	Specify a minimum acceptable profile
AT+GETIP	Packet domain command	Search IP via cid from local IP list
AT*TGSINK	Packet domain command	Private AT command: used to send the data through the specified PS data channel identified by cid
AT+CGSEND	Packet domain command	Private AT command: used to send the data through current activated PS data channel
AT+VPDUS	Packet domain command	Get Max PDU Size
AT+CGCMOD	Packet domain command	Modify the specified PDP context (s) with respect to QoS profiles and TFTs
AT+CGTFT	Packet domain command	Specify a Packet Filter - PF for a Traffic Flow Template
AT+FCLASS	Commands from TIA IS 101	Puts the TA into a particular mode of operation
AT+CGEQOS	Packet domain command	Specify the EPS Quality of Service for a PDP context or Traffic Flows
AT+CEREG	Packet domain command	Controls the presentation of an unsolicited result for EPS network registration status
AT+CGCONTRDP	Packet domain command	Returns the relevant information for a non secondary PDP Context
AT+CGS CONTRDP	Packet domain command	Returns primary context id and bearer id for a given context id
AT+CGTFTRDP	Packet domain command	Returns the relevant information about a Traffic Flow Template and additional network assigned values
AT+CGEQOSRDP	Packet domain command	Returns the Quality of Service parameters of an established PDP Context
AT+CGEREP	Packet domain command	Enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE
AT+CVMOD	Packet domain command	Selects the voice call mode for making a Mobile Originated voice call from the UE
AT+CEMODE	Packet domain command	Set the MT to operate according to the specified mode of operation for EPS
AT+CGPADDR	Packet domain command	Returns a list of PDP addresses for the specified context identifiers.
AT+CGCLASS	Packet domain command	Set the MT to operate according to the specified mode of operation
AT+CGPIAF	Packet domain command	Set format to print IPV6 address parameters of other AT commands

Primitives	Category	Quick Description
AT*AUTHReq	Packet domain command	Request to add authentication parameters to a defined PDP context.
AT*FASTDORM	Packet domain command	This proprietary AT command is used to make the device to initiate exit from DCH or FACH when the application knows that there is no more packet data expected.
AT*FDY	Packet domain command	This proprietary AT command is used to enable/disable Fast Dormancy Timer
AT*CGATT	Packet domain command	This proprietary AT command is used to enable/disable auto attach when power on
AT+CGDFLT	Packet domain command	used to set/get default PDP context
AT+VZWAPNE	Packet domain command	used to set/get APN list
AT*VZWTESTAPP	Packet domain command	used for VZW application test
AT+CEVDP	Packet domain command	Used to set the MT to operate according to the specified voice domain preference for E-UTRAN
AT+CVDP	Packet domain command	Used to set the MT to operate according to the specified voice domain preference for UTRAN
AT+CEUS	Packet domain command	Used to set the MT to operate according to the specified UE's usage setting for EPS
AT+CMMIVT	Packet domain command	Used to set the MT to perform additional procedures as specified in 3GPP TS 24.008 and 3GPP TS 24.301 to support terminating access domain selection by the network
AT*CIIND	Packet domain command	Notifies current IMS registration state to CP
AT+CMGF	SMS command	Tells the TA which input and output format of messages to use
AT+CMSS	SMS command	Sends message with location value <index> from preferred message storage to the network
AT+CMGS	SMS command	Transmits SMS message from TE to network in text or PDU mode
AT+CMGR	SMS command	Retrieves a message from the short message storage
AT+CMGW	SMS command	Stores a message in memory storage
AT+CSCA	SMS command	Updates the SMSC address

Primitives	Category	Quick Description
AT+CSCB	SMS command	Selects which types of CBMs are to be received by the ME
AT*CSCB	SMS command	Selects which types of CBMs are to be received by the ME
AT*CBMCS	SMS command	This proprietary AT command is used to set/get a CBM filter setting that decides which types of CBM are to be received by the ME.
AT+CNMI	SMS command	Selects the how receiving of new messages from the network is indicated to the TE
AT+CGSMS	SMS command	Specify the service or service preference that the MT will use to send MO SMS messages
AT+CMMS	SMS command	Controls the continuity of SMS relay protocol link
AT+CMGD	SMS command	Deletes message from preferred message storage location
AT+CMGL	SMS command	Returns messages with status value from preferred message storage to the TE
AT+CSMS	SMS command	Selects messaging service
AT+CSMP	SMS command	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
AT+CPMS	SMS command	Selects memory storages to be used for reading, writing, etc
AT*CNMA	SMS command	This proprietary AT command is based on AT+CNMA which is used to send ACK for a received SMS.
AT+CMEMFULL	SMS command	Report to network whether there is storage available for new SMS messages
AT^DCTS	Network monitor command	Control the mode switch of the MT between normal mode and test mode.
AT*MRD_CDF	ASR Factory command	This command is used to copy an existing file into RD
AT*MRD_SN	ASR Factory command	This command is used to write SN (serial number) to RD
AT*MRD_IMEI	ASR Factory command	This command is used to write IMEI to RD
AT*MRD_MEP	ASR Factory command	This command is used to write MEP to RD

Primitives	Category	Quick Description
AT*MRD_AUTH	ASR Factory command	This command is used for PC tools to get authorization from the UE to add, modify or remove the entries in RD
AT*MRD_DUMP	ASR Factory command	This command is used for dumping RD image
AT*CLK	ASR Factory command	This command is used to disable or unblock a specified MEP category
AT*MEPCG	ASR Factory command	This command is used to read the MEP codes for a specified category
AT+MVWFTST	Lab Tool related command	This proprietary AT command is used to do Wi-Fi related test.
AT+MVFIDRW	Lab Tool related command	This proprietary AT command is used to read and write Wi-Fi MAC address.
AT+MVBTTST	Lab Tool related command	This proprietary AT command is used to do BT related test.
AT+MVBTIDRW	Lab Tool related command	This proprietary AT command is used to read and write BT MAC address.
AT+MVFMTEST	Lab Tool related command	This proprietary AT command is used to do FM related test.
AT+EEMOPT	Engineering Mode related command	Set/Get GSM Engineering Mode indicator
AT+EMGINFO	Engineering Mode related command	Query GSM information in Engineering Mode. Only valid in query mode.
AT+LPNWUL	GPS related command	This AT command is used to deliver measurements reports and/or status from A-GPS client to PS/NW.
AT+LPOCVR	GPS related command	This AT command is used to respond to the location verification indication.
AT*GPSTEST	GPS related command	This proprietary AT command is used to do CSR and ASR GPS test.
AT+VDUMP	Other command	Set control loglevel. Store the log level to global variable
AT*POWERIND	Other command	This proprietary AT command is used to notify modem that AP sleep status. When AP goes to sleep, modem will not send indication to AP except MT call and SMS incoming.
AT*SYSSLEEP	Other command	This proprietary AT command is used to make device enter suspend state.

Primitives	Category	Quick Description
AT*LTEPOWER	Other command	This proprietary AT command is used to control LTE Tx/Rx power.
AT*GSMTR	Other command	This proprietary AT command is used to requests to set Tx or Rx on GSM for radio testing.
AT*RFC	Other command	This proprietary AT command is used to close production AT channel and switch to diag.
AT*MODEMRESET	Other command	This proprietary AT command is used to silent reset CP.
AT*SWITCHMODEM	Other command	This proprietary AT command is used to siwtch CP type.
AT*HTCCTO	Other command	This proprietary AT command is used to modify timeout values of AT commands
AT+LOOPTEST	Other command	This command is used to do loopback test.
AT*NASCHK	Other command	This command is used to disable/enable NAS integrity check function.
AT*USBT	Other command	This command is used to disable/enable USB Tethering.
AT*MOBILEDATA	Other command	This command is used to disable/enable data access ability of mobile network.
AT* RFTEMP	Other command	This command is used to read RF temperature.
AT* LTECOEX	Other command	This command is used to query/notify LTE status for coexit with WIFI/BT.

3.2 Summary of Indication Commands Supported by AT Command Server

Table 4: Summary of Indication Commands

Primitives	Category	Quick Description
RING	Call control indication	Indicates an incoming call (voice, data or fax) is indicated by the cellular network.
+CRING	Call control indication	Indicates the type of incoming call when receive an incoming call
NO CARRIER	Call control indication	Indicates a disconnect for Call Clearing or a Call Failed for an outgoing call.
+CHLD	Call control indication	Indication reminds the subscriber that there is a Held Call

Primitives	Category	Quick Description
+CCWA	Call control indication	Indicates Call Waiting (CW) information (when enabled) for an incoming call
+CLIP	Call control indication	Indicates the calling line identity of the calling party after every RING/+CRING
+CNAP	Call control indication	Indicates the calling name identity of the calling party after every RING/+CRING
+COLP	Call control indication	Indicates the connected line identity (COL) of the called party after setting up a mobile originated call
+CCCM	Call control indication	Unsolicited Periodic Current Call Meter (CCM) update indication
+CLCC	Call control indication	Presents an indication to list the current call information
+CSQ	Network service related indication	Indicates the received signal strength and channel bit error rate
+CESQ	Network service related indication	Indicates the received signal strength, channel bit error rate, received signal code power, ratio of energy per chip to noise specific density, reference signal receiving quality and reference signal receive power.
+CREG	Network service related indication	Indicates registration status and location information when there is a change in the MT's circuit mode network registration status or there is a change of the network cell in GERAN/UTRAN/E-UTRAN
+CSSI	Network service related indication	Supplementary Service Intermediate (SSI) Notification after mobile originated Call Setup, but before any Call Setup results are received
+CSSU	Network service related indication	Supplementary Service Unsolicited (SSU) Notification during a mobile terminated call setup or during a call
+CUSD	Network service related indication	Indicates incoming (received) USSD information
*REJCAUSE	Network service related indication	Indication of air interface reject cause code due to errors that can occur during MM/GMM procedures
*CellLock	Network service related indication	Indicates the status of cell lock
+NITZ	Network service related indication	Indicates local time and date information
*COPN	Network service related indication	Indicates network provider identity information
*BANDIND	Network service related indication	Indicates the current band, Indications are sent when the band changes and band indications are enabled

Primitives	Category	Quick Description
^MODE	Network service related indication	Indicates that system mode has changed
+CNEMIU	Network service related indication	Indicates emergency bearer services support for lu mode
+CNEMS1	Network service related indication	Indicates emergency bearer services support for S1 mode
+CPIN	Mobile control and status indication	Indication of current SIM status changed
+MSRI	Mobile control and status indication	Indication of allowing/disallowing Manual PLMN selection option in the user menu
+MPBK	Mobile control and status indication	Indicates that the SIM and/or NVRAM phonebooks are ready to use
+MSTK	Mobile control and status indication	Indication of commands or responses sent by ME to SIM or commands handled by ME, with these indication, the TE shall be able to indicate appropriate messages to a user
*EUICC	Mobile control and status indication	Indicates client application about a change in the PIN status of the SIM/USIM card
+REFRESH	Mobile control and status indication	Indicates that file(s) on the SIM have been updated, or the SIM has been reinitialized.
*AMR_CODEC	Mobile control and status indication	Indicate AMR codec type
+CEN	Mobile control and status indication	Indicated one line of intermediate result code +CEN1 with current reporting setting and zero or more occurrences of the emergency numbers with intermediate result code +CEN2
+CIREPI	Mobile control and status indication	IMS Voice Over PS sessions (IMSVOPS) supported indication from the network
+CIREPH	Mobile control and status indication	Provides PS to CS SRVCC, PS to CS vSRVCC and CS to PS SRVCC handover information.
*ISIMAID	Mobile control and status indication	Provides ISIM AID information
+CGREG	Packet domain indication	Indicates registration status and location information when there is a change in the MT's GPRS network registration status or there is a change of the network cell in GERAN/UTRAN

Primitives	Category	Quick Description
+CEREG	Packet domain indication	Indicates registration status and location information when there is a change in the MT's EPS network registration status
+CIREGU	Packet domain indication	Indicates registration status when there is a change in the MT's IMS registration information
+CGEV	Packet domain indication	Indication from MT to TE in the case of certain events occurring in the Packet Domain MT or the network.
CONNECT	Packet domain indication	Indicates that a data connection was established
NO CARRIER	Packet domain indication	Indicates that a data connection was disconnected
+CMT	SMS command indication	Displays the received SMS-DELIVER message upon receipt of a new SMS-DELIVER SM
+CMTI	SMS command indication	Indicates that a new SMS-DELIVER message was received, and is stored in the index of location
+CDS	SMS command indication	Received SMS status report content (only PDU mode supported).
+CBM	SMS command indication	Displays the received CB message upon receipt of a new cell broadcast message
+MMSG	SMS command indication	Indication of an Short Messages Storage status change
+EEMGINBFTM	Engineering mode related indication	To notify current network status which used for EFEM
+EEMLTESVC	Engineering mode related indication	Indication of serving-cell information in LTE Engineering Mode
+EEMLTEINTRA	Engineering mode related indication	Indication of Intra freq information in LTE Engineering Mode
+EEMLTEINTER	Engineering mode related indication	Indication of Inter freq information in LTE Engineering Mode
+EEMLTEINTERRAT	Engineering mode related indication	Indication of inter RAT information in LTE Engineering Mode
+EEMUMTSSVC	Engineering mode related indication	Indication of serving-cell information in UMTS Engineering Mode

Primitives	Category	Quick Description
+EEMUMTSINTERRAT	Engineering mode related indication	Indication of inter RAT information in UMTS Engineering Mode
+LPNWDL	GPS related indication	Indicates primitive from protocol stack to APPS, indicating of either RRC or RRLP positioning-related message from the network to the AGPS client running on the APPS
+LPSTATE	GPS related indication	AGPS C-Plane indication primitive from protocol stack to APPS, indicating of RRC state change.
+LPMEAST	GPS related indication	Indication primitive from protocol stack to APPS, indicating of RAT termination (either of GSM or WCDMA)
+LPRESET	GPS related indication	Indication primitive from protocol stack to APPS, which is a test I/F message (TIM) requesting the UE to erase all the assistance data that may have been previously stored in the UE, prior to the execution of the test.
+LPLOC	GPS related indication	Indication that the location information of the mobile was requested
@HTCDIS	Call control indication	Indicates the ATD disconnection cause
+HTCerror	Miscellaneous indication	Indicates some special error code to be easy MT further process
*CESQ	Network service related indication	
\$CESQ	Network service related indication	
+DIP		
*ADMINDATA		
+CEN1		
+CEN2		
*SIMDETEC		
*COPS		
*RADIOPOWER		

Primitives	Category	Quick Description
+CNEC_ESM		
+CNEC_GSM		
*DATASTATUS		
*ECALLDATA		
*ECALLVOICE		
*CLCC		
*PRXYREGSTATE		
+IMSUEEVENT		
*ECCLIST		

3.3 S-Register Commands

3.3.1 S0

Description

Set the automatic answering delay.

Syntax

Command	Possible responses
ATS0=<n> Note: <n>: Enable automatic answering after n seconds. Range: 0 - 255 Default Value: 0	1) If successful: OK 2) If failed ERROR
ATS0?	<n> OK

3.3.2 S3

Description

Set the Carriage Return character.

Syntax

Command	Possible responses
ATS3=<n> Note: <n>: Carriage Return character Range: 13 - 13 Default Value: 13	1) If successful: OK 2) If failed ERROR
ATS3?	<n> OK

3.3.3 S4

Description

Set the Line Feed character.

Syntax

Command	Possible responses
ATS4=<n> Note: <n>: Line Feed character. Range: 10 - 10 Default Value: 10	1) If successful: OK 2) If failed ERROR
ATS4?	<n> OK

3.3.4 S5

Description

Set the Backspace character.

Syntax

Command	Possible responses
ATS5=<n> Note: <n>: Backspace character. Range: 8 - 8 Default Value: 8	1) If successful: OK 2) If failed ERROR
ATS5?	<n> OK

3.4 Basic Commands

3.4.1 ATE

Description

This command is used to determine whether or not the modem echoes characters received by an external application.

Syntax

Command	Possible responses
ATE0 Note : Characters are not echoed	OK/+CME ERROR: <err>
ATE1 Note : Characters are echoed	OK/+CME ERROR: <err>

3.4.2 ATI

Description

Request manufacturer specific information about the TA

Syntax

Command	Possible responses
ATI	manufacturer specific information OK/+CME ERROR: <err>

3.4.3 ATQ

Description

This command determines whether the mobile equipment sends result codes or not

Syntax

Command	Possible responses
ATQ[<value>] Note: 0: DCE transmits result codes. 1: Result codes are suppressed and not transmitted.	OK If value is 0. (none) If value is 1 (because result codes are suppressed). ERROR For unsupported values (if previous value was Q0). (none) For unsupported values (if previous value was Q1).

3.4.4 ATV

Description

Set TA response format

Syntax

Command	Possible responses
ATV [<value>] Note: 0: DCE transmits limited headers and trailers and numeric text. 1: DCE transmits full headers and trailers and verbose response text.	0 If value is 0 (because numeric response text is being used). OK If value is 1. 4 For unsupported values (if previous value was V0). ERROR For unsupported values (if previous value was V1).

3.4.5 ATX

Description

Defines CONNECT result code format

Syntax

Command	Possible responses
ATX [<value>] Note: 0: CONNECT result code is given upon entering online data state. Dial tone and busy detection are disabled. 1: CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are disabled. 2: CONNECT <text> result code is given upon entering online data state. Dial tone detection is enabled, and busy detection is disabled. 3: CONNECT <text> result code is given upon entering online data state. Dial tone detection is disabled, and busy detection is enabled. 4: CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are both enabled.	OK If <value> is recognized. ERROR If <value> is not recognized or supported.

3.4.6 ATZ

Description

This command restores the configuration profile.

Syntax

Command	Possible responses
ATZ	OK/+CME ERROR: <err>

3.4.7 AT&F

Description

This command reloads the factory-stored default configurations into active memory.
This command's functionality is the same as Z (reset).

Syntax

Command	Possible responses
AT&F	OK/+CME ERROR: <err>

3.4.8 AT&Z

Description

Stores a telephone number into the modems telephone directory

Syntax

Command	Possible responses
&Z<location>=<dial-string> &Z<location>=L (save last number dialed to <location>) &Z=<dial-string> (location defaults to 0) &Z=L (location defaults to 0) Note: <location> is a number Example: AT&Z0=12345678	OK/+CME ERROR: <err>
&Z<location>? &ZL? (print last number dialed) &Z? (location defaults to 0)	<phone number> Example: 12345678 OK

3.5 General Commands

3.5.1 AT+CMEE

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.

Syntax

Command	Possible responses
+CMEE=[<n>] Note: <n>: 0: disable +CME ERROR: <err> result code and use ERROR instead 1: enable +CME ERROR: <err> result code and use numeric <err> values 2: enable +CME ERROR: <err> result code and use verbose <err> values	OK/+CME ERROR: <err>
+CMEE=?	+CMEE: <n> OK
+CMEE=?	+CMEE: (list of supported <n>s) OK

3.5.2 AT+CGMI

Description

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

Syntax

Command	Possible responses
+CGMI	+CGMI: <manufacturer> OK

3.5.3 AT+CGMM

Description

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

Syntax

Command	Possible responses
+CGMM	+CGMM: <model> OK

3.5.4 AT+CGMR

Description

Execution command causes the TA to return one or more lines of information text regarding revision. It can return COMM side image version.

Syntax

Command	Possible responses
+CGMR	<revision>

3.5.5 AT*CGMR

Description

Execution command causes the TA to return one or more lines of information. It can return COMM side image version and build time.

Syntax

Command	Possible responses
*CGMR	*CGMR: <revision>,<build time> OK

3.5.6 AT+CGSN

Description

Execution command causes the TA to return one or more lines of information text regarding serial number. It can return the IMEI information.

Syntax

Command	Possible responses
+CGSN	<sn> OK

3.5.7 AT*CGSN

Description

This proprietary AT command is used to read/update SVN of IMEISV.

Syntax

Command	Possible responses
*CGSN=<sv>	OK/+CME ERROR;<err>
*CGSN?	*CGSN: <sv> OK
*CGSN=?	*CGSN: <sv> OK

Defined values

<sv>:
SVN of IMEISV

Note: The example when use this AT command is as following:

1. read SVN

AT*CGSN?

*CGSN: 00

OK

2. update SVN

AT*CGSN=11

OK

3.5.8 AT+CSCS

Description

Set command informs TA which character set <chset> is used by the TE.

Syntax

Command	Possible responses
+CSCS=[<chset>] Note: <chset>:	OK/+CME ERROR: <err>

"IRA" International reference alphabet "UCS2" 16-bit universal multiple-octet coded character set "HEX" Character strings consist only of hexadecimal numbers from 00 to FF	
+CSCS?	+CSCS: <chset> OK
+CSCS=?	+CSCS: ("IRA","UCS2","HEX") OK

3.5.9 AT+CIMI

Description

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

Syntax

Command	Possible responses
+CIMI	<IMSI> OK

3.5.10 AT+ASTO

Description

Save/fetch dial-string

Syntax

Command	Possible responses
AT+ASTO=<string>,<number> Note: Example: AT+ASTO="\22fred\22",123-4567	OK/+CME ERROR: <err>
AT+ASTO?	+ASTO:<information text> OK Example: +ASTO: "fred",1234567 OK
AT+ASTO=?	+ASTO: (0-32),(64) OK

3.5.11 AT+GMI

Description

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

desired (e.g., address, telephone number for customer service, etc.). It is same as AT+CGMI.

Syntax

Command	Possible responses
+GMI	+GMI:<information string> OK Example: +GMI: "ASR" OK

3.5.12 AT+GMM

Description

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

Syntax

Command	Possible responses
+GMM	+GMM:<information string> OK Example: +GMM: "ThreadX R-5.8" OK

3.5.13 AT+GMR

Description

This command causes the MT to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the MT to identify the version, revision level or date, or other pertinent information of the device. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide any information desired. It's same as AT+CGMR.

Syntax

Command	Possible responses
+GMR	<revision>

3.5.14 AT+GSN

Description

This command causes the MT to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the MT to identify the individual device. Typically, the text will consist of a single line containing a

manufacturer determined alpha-numeric string, but manufacturers may choose to provide any information desired. It's same as AT+CGSN.

Syntax

Command	Possible responses
+GSN	<sn> OK Example: 35253501158696 OK

3.5.15 AT^HVER

Description

This command get the hardware version of ME.

Syntax

Command	Possible responses
^HVER	'HVER:<hardversion> OK/+CME ERROR: <err> Example: 'HVER:"Rev 0000" OK

3.5.16 AT+GCAP

Description

This extended-format command causes the MT to transmit one or more lines of information text in a specific format. The content is a list of additional capabilities command +<name>s, which is intended to permit the user of the MT to identify the minimum capabilities of the MT.

Syntax

Command	Possible responses
+GCAP	+GCAP:<information string> OK

3.5.17 AT+CLAC

Description

This command is used to list all available AT commands.

Syntax

Command	Possible responses

+CLAC	<AT Command1> [<CR><LF><AT Command2> [. . .] OK
-------	--

3.5.18 AT+CCLK

Description

Set command sets the real-time clock(GMT) of the MT.
Read command returns the current setting of the clock.

Syntax

Command	Possible responses
+CCLK=<time>	OK/+CME ERROR: <err>
+CCLK?	+CCLK: <time> OK/+CME ERROR: <err>

Defined values

<time>: string type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96...+96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

3.5.19 AT*VER

Description

This command get the hardware and software version of ME. Special command for CTA

Syntax

Command	Possible responses
*VER	*VER:<swversion> *VER:<hwversion> OK/+CME ERROR: <err>

3.5.20 Unsolicited result code: *ATREADY

Description

ASR extended AT command to indicate that AT command server is ready to handle AT commands

Syntax

*ATREADY: <bReady>

Defined Values

<bReady>: indicate whether AT command server is ready to handle AT commands

1	ready
0	not ready

3.6 Call Control Commands

3.6.1 ATA

Description

Instructs the modem to immediately go off-hook and attempt to establish a connection without waiting for a ring, this is used to answer an incoming call if auto answer (s0) is disabled.

Syntax

Command	Possible responses
ATA Note: Answer a call	OK/+CME ERROR: <err>

3.6.2 ATD

Description

Causes the MT to transition from the command state to the online state

Syntax

Command	Possible responses
ATD<dial string>; Note: The <dial string> is optional. For circuit switched data services, the dial string may contain the following characters: Digits 0 to 9, *, #; After dialing, the IWF enters the online command state and maintains the connection	OK/+CME ERROR: <err>

3.6.3 AT*DIALE

Description

This proprietary AT command is used to make an emergency call.

Syntax

Command	Possible responses
AT*DIALE=<dial string>,<service Type> Parameter: < dial string >: string type The dial string may contain the following characters: Digits 0 to 9, *, #, max length is 39. <service Type>: Bit mask indicating the	OK/+CME ERROR:<err> Example: AT*DIALE =120,2 OK

required emergency call service category. Bit 0: POLICE Bit 1: AMBULANCE Bit 2: FIRE_BRIGADE Bit 3: MARINE_GUARD Bit 4: MOUNTAIN_RESCUE	
AT*DIALE=?	*DIALE: <number>, (0-31) OK

3.6.4 AT+CDU

Description

This proprietary AT command is used to dial a URI

Syntax

Command	Possible responses
+CDU=<action>[,<URI>[,,<CLIR_OIR>]] Parameter: <action>: string type. Dial <URI> using the indicated communication client with the indicated media profile. <URI>: string type. URI including the prefix specifying the URI type. The URI may include URI parameters <CLIR_OIR>: integer type. Indicates per call basis changes provided to the supplementary service CLIR / OIR.	OK/+CME ERROR:<err>

3.6.5 ATH

Description

Causes the MT to transition from online command state to command state; use of the digit '0' is optional.

Syntax

Command	Possible responses
ATH[<value>] Note: <value> 0: Disconnect from line and terminate call.	OK/+CME ERROR: <err>

3.6.6 AT+ECHUPVT

Description

The execution command is used to hang up all connecting or connected CS calls and provide the cause. It can be used when the user would like to fall back an incoming VT call to VOICE call.

Syntax

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

3.6.7 AT+CBST

Description

Set command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated (refer 3GPP TS 22.002).

Syntax:

Command	Possible responses
+CBST=<speed>[,<name>[,<ce>]] Sample: AT+CBST=134,1,0 Note: <speed>: 0 autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 1 300 bps (V.21) 2 1200 bps (V.22) 3 1200/75 bps (V.23) 4 2400 bps (V.22bis) 5 2400 bps (V.26ter) 6 4800 bps (V.32) 7 9600 bps (V.32) 12 9600 bps (V.34) 14 14400 bps (V.34) 15 19200 bps (V.34) 16 28800 bps (V.34) 17 33600 bps (V.34) 34 1200 bps (V.120) 36 2400 bps (V.120) 38 4800 bps (V.120) 39 9600 bps (V.120) 43 14400 bps (V.120) 47 19200 bps (V.120) 48 28800 bps (V.120) 49 38400 bps (V.120) 50 48000 bps (V.120) 51 56000 bps (V.120) 65 300 bps (V.110) 66 1200 bps (V.110) 68 2400 bps (V.110 or X.31 flag stuffing) 70 4800 bps (V.110 or X.31 flag stuffing) 71 9600 bps (V.110 or X.31 flag stuffing) 75 14400 bps (V.110 or X.31 flag stuffing) 79 19200 bps (V.110 or X.31 flag stuffing) 80 28800 bps (V.110 or X.31 flag stuffing) 81 38400 bps (V.110 or X.31 flag stuffing) 82 48000 bps (V.110 or X.31 flag stuffing) 83 56000 bps (V.110 or X.31 flag stuffing; 84 64000 bps (X.31 flag stuffing; 115 56000 bps (bit transparent) 116 64000 bps (bit transparent) 120 32000 bps (PIAFS32k) 121 64000 bps (PIAFS64k) 130 28800 bps (multimedia)	OK/+CME ERROR: <err>

131 32000 bps (multimedia) 132 33600 bps (multimedia) 133 56000 bps (multimedia) 134 64000 bps (multimedia)	
<name>: 0 data circuit asynchronous (UDI or 3.1 kHz modem) 1 data circuit synchronous (UDI or 3.1 kHz modem) 2 PAD Access (asynchronous) (UDI) 3 Packet Access (synchronous) (UDI) 4 data circuit asynchronous (RDI) 5 data circuit synchronous (RDI) 6 PAD Access (asynchronous) (RDI) 7 Packet Access (synchronous) (RDI)	
<ce>: 0 transparent 1 non-transparent 2 both, transparent preferred 3 both, non-transparent preferred	
+CBST?	+CBST:<speed>,<name>,<ce> OK/+CME ERROR: <err>
+CBST=?	+CBST: (list of supported <speed>s), (0-7),(0-3) OK

3.6.8 AT+CVHU

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.

Syntax

Command	Possible responses
+CVHU=<mode> Note: <mode>: 0: "Drop DTR" ignored but OK response given. ATH disconnects. 1: "Drop DTR" and ATH ignored but OK response given. 2: "Drop DTR" behaviour according to &D setting. ATH disconnects.	OK/+CME ERROR: <err> Note: <mode> is 0, 1 or 2 will return "OK", other parameters will return an error
+CVHU?	+CVHU: <mode> OK
+CVHU=?	+CVHU:(0-2) OK

3.6.9 AT+CRLP

Description

Radio link protocol (RLP) parameters used when non-transparent data calls are originated may be altered with set command.

Syntax

Command	Possible responses
---------	--------------------

+CRLP=<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]] Note: <iws>: IWF to MS window size <mws>: MS to IWF window size <T1>: acknowledgement timer T1 <N2>: retransmission attempts <ver>: RLP version number in integer format; when version indication is not present it shall equal 0 <T4>: re-sequencing period	OK/+CME ERROR: <err>
+CRLP?	+CRLP:<iws>,<mws>,<T1>,<N2>[,<ver1>[,<T4>]] [<CR><LF> OK or +CRLP:<iws>,<mws>,<T1>,<N2>[,<ver2>[,<T4>]] [...] OK Example: +CRLP:61,61,128,6,1,3 OK
+CRLP=?	+CRLP:(0-61),(0-61),(39-255),(1-255),(0-1),(3-255) OK

3.6.10 AT+CMUT

Description

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

Syntax

Command	Possible responses
+CMUT=<n> Note: <n> 0: mute off 1: mute on	OK/+CME ERROR: <err>
+CMUT?	+CMUT: 0 OK
+CMUT=?	+CMUT: 0,1 OK

3.6.11 AT+CHUP

Description

Execution command causes the TA to hang-up the current UMTS call of the MT.

Syntax

Command	Possible responses
+CHUP	OK/+CME ERROR: <err>

3.6.12 AT+CSTA

Description

Set command selects the type of number for further dialing commands (D) according to UMTS specifications.

Syntax

Command	Possible responses
+CSTA=[<type>] Note: <type>: type of address octet in integer format(refer TS 24.008 subclause 10.5.4.7); default 145 when dialling string includes international access code character "+", otherwise 129	OK/+CME ERROR: <err>
+CSTA?	+CSTA: <type> OK Example: +CSTA:129 OK
+CSTA=?	+CSTA: (129,145,161,177) OK

3.6.13 AT+CRC

Description

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

Syntax

Command	Possible responses
+CRC=[<mode>] Note: <mode>: 0: disables extended format 1: enables extended format	OK/+CME ERROR: <err> When enabled extended format, there will be unsolicited code +CRING: <type> <type>: ASYNC SYNC REL ASYNC REL SYNC FAX VOICE VOICE/ASYNC VOICE/SYNC VOICE/REL ASYNC VOICE/REL SYNC ALT VOICE/ASYNC ALT VOICE/SYNC ALT ASYNC/VOICE ALT SYNC/VOICE ALT REL ASYNC/VOICE

	ALT REL SYNC/VOICE ALT VOICE/FAX ALT FAX/VOICE
+CRC?	+CRC: <mode> OK Example: +CRC: 0 OK
+CRC=?	+CRC: (0,1) OK

3.6.14 AT+DS

Description

Controls ITU-T Recommendation V.42bis data compression functions

Syntax

Command	Possible responses
+DS=[<direction>[,<compression_negotiation>[,<max_dict>[,<max_string>]]]] Notes: < direction> 0 No compression (default) 1 Transmit only 2 Receive only 3 Both directions <compression_negotiation> 0 Do not disconnect if V.42bis is not negotiated by the remote DCE as specified in <direction> (default) 1 Disconnect if V.42bis is not negotiated by the remote DCE as specified in <direction> <max_dict> can take on the following values: 512 to 2048. Default is 512. <max_string> can take on the following values: 6 to 250. Default is 6.	OK/+CME ERROR: <err>
+DS?	<direction>,<compression_negotiation>,<max_dict>,<max_string> OK Example: 0,0,512,20 OK
+DS=?	+DS: (0-3),(0-1),(512-65535),(6-250) OK

3.6.15 AT+CEER

Description

Execution command causes the TA to return one or more lines of information text <report>. Including:

- the failure in the last unsuccessful call setup
- the last call release;

Syntax

Command	Possible responses
+CEER	<p>+CEER: <report> OK Notes: <report>: string type "0 Unknown" "1 Unassigned number" "3 No route to destination" "6 Channel unacceptable" "8 Operator determined barring" "16 Normal call clearing" "17 User busy" "18 No user responding" "19 User alerting: no answer" "21 Call rejected" "22 Number changed" "25 Preemption" "26 Non selected user clearing" "27 Destination out of order" "28 Invalid number format" "29 Facility rejected" "30 Response to STATUS ENQUIRY" "31 Normal: unspecified" "34 No circuit/channel available" "38 Network out of order" "41 Temporary failure" "42 Switching equipment congestion" "43 Access information discarded" "44 Requested circuit/channel unavailable" "47 Resource unavailable" "49 QoS unavailable" "50 Requested facility not subscribed" "55 Incoming calls barred within CUG" "57 Bearer capability not authorized" "58 Bearer capability not available" "63 Service not available" "65 Bearer service not implemented" "68 ACM MAX reached" "69 Facility not implemented" "70 Only RDI bearer capability available" "79 Service not implemented" "81 Invalid transaction ID" "87 User not member of CUG" "88 Incompatible destination" "91 Invalid transit network selection" "95 Incorrect message" "96 Invalid mandatory information" "97 Message type non-existent" "98 Message type wrong state" "99 Information element not-existent" "100 Conditional IE error" "101 Message wrong state" "102 Recovery after timer expiry" "111 Protocol error: unspecified" "127 Interworking: unspecified" "224 Call barring" "241 FDN Blocked" </p>
+CEER=?	OK

3.6.16 AT*CISCC

Description

This command is used to notify current call state maintained by IMS stack to CP side in SRVCC procedures.

Syntax

Command	Possible responses
<code>*CISCC=<call1>[,<call2>[, ...]]</code> Notes: <call1>, <call2>: String type having the call info in the result code format given below “+INFO: <idx>, <flag>, <stat>, <mode>, <mpty>, <number>, <type>, <CLI_Validity>, <emergency>” <idx>: integer type. Call identification number as described in 3GPP TS 22.030 sub clause 6.5.5.1. <flag>: integer type. 0 indicates MO call, 1 indicates MT call <emergency>: integer type. 0 indicates normal call, 1 indicates emergency call. <stat>, <mode>, <mpty>, <number>, <type>, and <CLI validity> are the same as definitions in +CLCC. The minimum of call number is 1, and the maximum of call number is 7.	OK/+CME ERROR: <err>

3.7 Network Service Related Commands

3.7.1 AT+CREG

Description

Set command controls the presentation of an unsolicited result for network registration status change.

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.

Syntax

Command	Possible responses
<code>+CREG=[<n>]</code> Note: <n>: 0: disable network registration unsolicited result code	OK/+CME ERROR: <err>

<p>1: enable network registration unsolicited result code +CREG: <stat></p> <p>2: enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>,<AcT>]</p> <p>3: enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[,<lac>,<ci>,<AcT>][,<cause_type>,<reject_cause>] <stat>:</p> <ul style="list-style-type: none"> 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) 11: only emergency services are available. <p><lac>: string type; two byte location area code in hexadecimal format</p> <p>12: registration denied in roaming</p> <p>13: sync done in LTE roaming network</p> <p>14: ecall inactive</p> <p><ci>: string type; four byte cell identifier in hexadecimal format. GSM case: 16 least significant bits ,WCDMA case: CellId - 16 least significant bits ,RNCID - 12 most significant bits</p> <p><AcT>:</p> <ul style="list-style-type: none"> 0: GSM 1: GSM Compact 2: UTRAN 3: GSM w/EGPRS 4: UTRAN w/HSDPA 5: UTRAN w/HSUPA 6: UTRAN w/HSDPA and HSUPA 7: E-UTRAN 8: UTRAN w/HSPA+ 9: E-UTRAN CA <p><cause_type>: integer type; indicates the type of <reject_cause>.</p> <p>0: Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G.</p> <p>1: Indicates that <reject_cause> contains a manufacturer specific cause.</p> <p><reject_cause>: integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.</p>	
<p>+CREG?</p>	<p>+CREG: <n>,<stat>[,<lac>,<ci>,<AcT>[,<cause_type>,<reject_cause>]]</p>

	OK Example: +CREG: 2,1,"a842","01b29362",2 OK
+CREG=?	+CREG: (0-3) OK

3.7.2 AT+CIND

Description

Set command is used to set the values of MT indicators.

Read command returns the status of MT indicators.

Test command returns pairs, where string value <descr> is a maximum 16 character description of the indicator and compound value is the allowed values for the indicator.
Currently only support network mode indicator.

Syntax

Command	Possible responses
+CIND=<ind> Notes: <ind> 0 indicator is off 1 indicator is on	OK/+CME ERROR: <err>
+CIND?	+CIND: <ind>[,<ind>[,...]] OK Example: +CIND:1 OK
+CIND=?	+CIND: ("service", (0-1)) OK

3.7.3 AT+COPS

Description

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

Read command returns the current mode, the currently selected operator and the current Access Technology, if both CS/PS have operator info, CS is preferred.

Syntax

Command	Possible responses
+COPS=<mode>[,<format>[,<oper>[,<AcT>]]] Note: <mode>: 0: automatic (<oper> field is ignored) 1: manual (<oper> field shall be present, and <AcT> optionally) 2: deregister from network 3: set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> and <AcT> fields are ignored); this value is not applicable in	OK/+CME ERROR: <err>

<p>read command response</p> <p>4: manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered</p> <p>5: enable the reporting of searched network operators, *PLMNLIST indication will be reported</p> <p><format>:</p> <p>0: long format alphanumeric <oper></p> <p>1: short format alphanumeric <oper></p> <p>2: numeric <oper></p> <p><oper>: string type; <format> 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); numeric format is the GSM Location Area Identification number (refer TS 24.008 subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T E.212 Annex A , 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)</p> <p><AcT> access technology selected:</p> <p>0: GSM</p> <p>1: GSM Compact</p> <p>2: UTRAN</p> <p>3: GSM EGPRS</p> <p>4: UTRAN HSDPA</p> <p>5: UTRAN HSUPA</p> <p>6: UTRAN HSPA</p> <p>7: EUTRAN</p> <p>8: UTRAN w/HSPA+</p> <p>9: E-UTRAN CA</p>	
<p>+COPS?</p>	<p>+COPS: <mode>[,<format>,<oper>[,<AcT>]]</p> <p>OK/+CME ERROR: <err></p> <p>Example:</p> <p>+COPS: 0,2,"46000",2</p> <p>OK</p>
<p>+COPS=?</p>	<p>+COPS: [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric <oper>,numeric <oper>[,<AcT>])s]</p> <p>[,(list of supported <mode>s),(list of supported <format>s)]</p> <p>OK/+CME ERROR: <err></p> <p><stat>: integer type</p> <p>0 unknown</p> <p>1 available</p> <p>2 current</p> <p>3 forbidden</p> <p>Example:</p> <p>+COPS: (1, "CHN-UNICOM",</p>

	"UNICOM", "46001", 2,,(0,1,2,3,4), (0,1,2) OK
--	---

3.7.4 Unsolicited result code: *PLMNLIST

Description

ASR extended AT command to indicate the searched PLMN list info. Will be report after sending AT+COPS=5

Syntax

*PLMNLIST: <mcc>,<mnc>,<act>,<rssi/rscp/rsrp>

Defined Values

< mcc >: string type, MCC value, maximum length 3

< mnc >: string type, MNC value, maximum length 3

< act >: integer type, refer to AT+COPS

< rssi/rscp/rsrp>: integer type

2G RSSI

3G RSCP

4G RSRQ

Example:

```
AT+COPS=5
*PLMNLIST:"460","00",7,-79
*PLMNLIST:"460","11",7,-85
*PLMNLIST:"460","01",7,-81
*PLMNLIST:"460","08",7,-100
```

OK

3.7.5 AT+CPOL

Description

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

Syntax

Command	Possible responses
+CPOL=[<index>[,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<EUTRAN_AcT>]]]] Note: <index>: integer type; the order number of operator in the SIM/USIM preferred operator list	OK/+CME ERROR: <err>

<pre> <format>: 0: long format alphanumeric <oper> 1: short format alphanumeric <oper> 2: numeric <oper> <oper>: string type; <format> indicates if the format is alphanumeric or numeric <GSM_AcT>: GSM access technology: 0: access technology not selected 1: access technology selected <GSM_Compact_AcT>: GSM compact access technology: 0: access technology not selected 1: access technology selected <UTRAN_AcT>: UTRAN access technology: 0: access technology not selected 1: access technology selected <EUTRAN_AcT>: EUTRAN access technology: 0: access technology not selected 1: access technology selected </pre>	
<pre>+CPOL?</pre>	<pre> +CPOL: <index1>,<format>,<oper1>[,<GS M_AcT1>,<GSM_Compact_AcT1> ,<UTRAN_AcT1>],<EUTRAN_AcT 1> [<CR><LF>]+CPOL: <index2>,<format>,<oper2>[,<GS M_AcT2>,<GSM_Compact_AcT2> ,<UTRAN_AcT2>],<EUTRAN_AcT 2> [...] OK/+CME ERROR: <err> Example: +CPOL: 1, 2, "46001" +CPOL: 2, 2, "46002" OK </pre>
<pre>+CPOL=?</pre>	<pre> +CPOL: (1-254),(0-2),<oper string>,<GSM_AcT>,<GSM_Comp act_AcT>,<UTRAN_AcT> OK </pre>

3.7.6 AT+CLCK

Description

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

Syntax

Command	Possible responses
+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	OK/+CME ERROR: <err> Note: when <mode>=2 and command successful: +CLCK: <status>[,<class1> [<CR><LF>]+CLCK: <status>,<class2> [...]
+CLCK=?	+CLCK: ("CS", "PS", "PF", "SC", "AO", "OI", "OX", "AI", "IR", "NT", "NM", "NS", "NA", "AB", "AG", "AC", "FD", "PN", "PU", "PP", "PC")

OK

Defined values:

<fac>:

- "PS" PH-SIM (lock Phone to SIM/UICC card) (MT asks password when other than current SIM/UICC card inserted; MT may remember certain amount of previously used cards thus not requiring password when they are inserted)
- "PF" lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)
- "SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)
- "AO" BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 clause 1)
- "OI" BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 clause 1)
- "OX" BOIC-exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 clause 1)
- "AI" BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 clause 2)
- "IR" BIC-Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 clause 2)
- "AB" All Barring services (refer 3GPP TS 22.030) (applicable only for <mode>=0)
- "AG" All outGoing barring services (refer 3GPP TS 22.030) (applicable only for <mode>=0)
- "AC" All inComing barring services (refer 3GPP TS 22.030) (applicable only for <mode>=0)
- "FD" SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
- "PN" Network Personalization (refer 3GPP TS 22.022)
- "PU" network sUbset Personalization (refer 3GPP TS 22.022)
- "PP" service Provider Personalization (refer 3GPP TS 22.022)
- "PC" Corporate Personalization (refer 3GPP TS 22.022)

<mode>:

0 unlock

1 lock

2 query status

<status>:

0 not active

1 active

<passwd>: string type; shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD

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

1 voice (telephony)

2 data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)

4 fax (facsimile services)

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access

3.7.7 AT+CPWD

Description

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

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

Syntax

Command	Possible responses
+CPWD=<fac>,<oldpwd>,<newpwd> <fac>: "P2": SIM PIN2 refer +CLCK for other values <oldpwd>, <newpwd>: string type; <oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>	OK/+CME ERROR: <err>
+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s OK

3.7.8 AT+CLIP

Description

This command refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

Syntax

Command	Possible responses
+CLIP=<n> Note: <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.)	OK/+CME ERROR: <err> When the presentation of the CLI at the TE is enabled (and calling subscriber allows), unsolicited result code +CLIP: <number>,<type> is returned after every RING <number>:string type phone number of format specified by <type> <type>:type of address octet in integer format, refer 3GPP TS 24.008 subclause 10.5.4.7
+CLIP?	+CLIP: <n>,<m> OK/+CME ERROR: <err>
+CLIP=?	+CLIP: (0-1) OK

3.7.9 AT+CLIR

Description

This command refers to CLIR service according to 3GPP TS 22.081 that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

Syntax

Command	Possible responses
+CLIR=<n> Note: <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	OK/+CME ERROR: <err>
+CLIR?	+CLIR: <n>,<m> OK/+CME ERROR: <err>

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

3.7.10 AT+COLP

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.

Syntax

Command	Possible responses
+COLP=<n> Note: <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 the network): 0: COLP not provisioned 1: COLP provisioned 2: unknown (e.g. no network, etc.)	OK/+CME ERROR: <err> When enables the presentation of the COL at the TE(and called subscriber allows), +COLP: <number>,<type> intermediate result code is returned from TA to TE. <number> and <type> refer to 3.7.7
+COLP?	+COLP: <n>,<m> OK/+CME ERROR: <err>
+COLP=?	+COLP: (0-1) OK

3.7.11 AT+COLR

Description

Interrogation of the COLR Service support

Syntax

Command	Possible responses
AT+COLR?	+COLR: <local>,<provision> OK/+CME ERROR: <err>
AT+COLR=?	OK

Defined values

< local>: integer type (parameter shows the subscriber COLR service status in the local)

0 COLR not provisioned

< provision>: integer type (parameter shows the subscriber COLR service status in the network)

0 COLR not provisioned

1 COLR provisioned

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

3.7.12 AT+CNAP

Description

This command refers to the GSM/UMTS supplementary service CNAP (Calling Name Presentation) 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.

Syntax

Command	Possible responses
AT+CNAP=[<n>] <n>: integer type (parameter sets/shows the result code presentation status to the TE) 0 disable 1 enable	OK/+CME ERROR: <err> When the presentation of the CNI at the TE is enabled (and CNI is provided), Unsolicited result code +CNAP. <name> will sent from MT to TE. <name>: string type, up to 31 characters long string containing the calling name
AT+CNAP?	+CNAP: <n>,<m> OK/+CME ERROR: <err> <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.)
AT+CNAP=?	+CNAP: (0-1) OK

3.7.13 AT+CCFC

Description

This command allows control of the call forwarding supplementary service according to 3GPP TS 22.082. Registration, erasure, activation, deactivation, and status query are supported.

Test command returns reason values supported as a compound value.

Syntax

Command	Possible responses
+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]] Note: <reason>:	OK/+CME ERROR: <err> Note: when <mode>=2 and command successful: +CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][<CR><LF>

<p>0: unconditional 1: mobile busy 2: no reply 3: not reachable 4: all call forwarding (refer 3GPP TS 22.030) 5: all conditional call forwarding (refer 3GPP TS 22.030)</p> <p><mode>: 0: disable 1: enable 2: query status 3: registration 4: erasure</p> <p><number>: string type phone number of forwarding address in format specified by <type></p> <p><type>: type of address octet in integer format (refer TS 24.008 subclause 10.5.4.7); default 145 when dialling string includes international access code character "+", otherwise 129</p> <p><subaddr>: string type subaddress of format specified by <satype></p> <p><satype>: type of subaddress octet in integer format (refer TS 24.008 subclause 10.5.4.8); default 128</p> <p><class> is a sum of integers each representing a class of information (default 7):</p> <ul style="list-style-type: none"> 1: voice (telephony) 2: data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) 4: fax (facsimile services) 8: short message service 16: data circuit sync 32: data circuit async 64: dedicated packet access 128: dedicated PAD access <p><time>: 1...30: when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20</p> <p><status>: 0: not active 1: active</p>	<p>+CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [...]]</p>
+CCFC=?	+CCFC: (0,1,2,3,4,5) OK

3.7.14 AT+CCWA

Description

This command allows control of the Call Waiting supplementary service according to 3GPP TS 22.083.

Syntax

Command	Possible responses
+CCWA=[<n>[,<mode>[,<class>]]]	OK/+CME ERROR: <err>

<p>Note: <n> integer type(local cw option)</p> <p>0: disable local CW</p> <p>1: enable local CW</p> <p><mode> integer type (when <mode> parameter is not given, network is not interrogated)</p> <p>0:disable</p> <p>1:enable</p> <p>2:query status</p> <p><class></p> <p>refer to 3.7.12</p>	<p>Note:</p> <p>when <mode>=2 and command successful</p> <p>+CCWA: <status>,<class1></p> <p>[<CR><LF>+CCWA: <status>,<class2> [...]]</p> <p><status>:</p> <ul style="list-style-type: none"> 0 not active 1 active <p><classx>:</p> <p>refer to 3.7.12</p> <p>This can also be an indication sent to the TE from the MT:</p> <p>+CCWA:<number>,<type></p> <p><number> and <type> refer to 3.7.7</p>
+CCWA?	<p>+CCWA: <n></p> <p>OK</p> <p>Example:</p> <p>+CCWA: 1</p> <p>OK</p>
+CCWA=?	<p>+CCWA: (0-1)</p> <p>OK</p>

3.7.15 AT+CHLD

Description

This command allows the control of the following call related services:

- a call can be temporarily disconnected from the MT but the connection is retained by the network;
- multiparty conversation (conference calls);
- the served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection.

Calls can be put on hold, recovered, released, added to conversation, and transferred similarly as defined in 3GPP TS 22.030.

Syntax

Command	Possible responses
+CHLD=<n>	<p>OK/+CME ERROR: <err></p> <p>When there is a Held Call, unsolicited result code +CHLD: <callId> will sent to remind subscriber.</p> <p><callId>: Integer type, unique Call Identifier indicate current held call.</p>
+CHLD=?	+CHLD: (0, 1, 1x, 2, 2x, 3, 4)

	<p>OK</p> <p>Call hold operation:</p> <p>0 - Release all held calls or set User Determined User Busy (UDUB) for a waiting call</p> <p>1 - Release all active calls (if any exist) and accept the other (held or waiting) call</p> <p>1x - Release specific active call x, where x is the serial number of a call participating in an active Multiparty call.</p> <p>2- Place all active calls (if any exist) on hold and accept other (held or waiting) call</p> <p>2x - In the case of an active Multiparty call, places all active calls on hold, except for call x. Call x remains active.</p> <p>3 - Add a held call to the conversation (Multiparty)</p> <p>4 - Connects the two calls and disconnects the subscriber from both calls (ECT)</p>
--	--

When there is a Held Call, indication +CHLD: <callId> will sent to remind subscriber.
<callId>: Integer type, unique Call Identifier indicate current held call.

3.7.16 AT+CUSD

Description

This command allows control of the Unstructured Supplementary Service Data (USSD) according to 3GPP TS 22.090.

Syntax

Command	Possible responses
+CUSD=<n>[,<str>[,<dcs>]] Note: <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 (when <str> parameter is not given, network is not interrogated) <dcs>: 3GPP TS 23.038 Cell Broadcast Data Coding Scheme in integer format (default 0)	OK/+CME ERROR: <err> The Set command enables/disables the display of the following unsolicited result code, +CUSD: <m>[,<str>,<dcs>] (the USSD response from the network), to the TE.
+CUSD?	+CUSD: <n> OK Example; +CUSD: 1 OK
+CUSD=?	+CUSD: (0-2) OK

+CUSD Notification values

<m>: integer type(shows the USSD response from the network or the network initiated operation)

0 no further user action required

1 further info needed for MO operation

2 USSD terminated by network

- 3 other local client has responded
- 4 operation not supported
- 5 network time out
- 6 phase 2 fail and retry phase 1

3.7.17 AT+CAOC

Description

This refers to Advice of Charge supplementary service (3GPP TS 22.024 and 3GPP TS 22.086) that enables subscriber to get information about the cost of calls. The command also includes the possibility to enable an unsolicited event reporting of the CCM information.

The Read command indicates whether the unsolicited reporting is activated or not.

Syntax

Command	Possible responses
+CAOC[=<mode>] Note: <mode>: 0: query CCM value 1: deactivate the unsolicited reporting of CCM value 2: activate the unsolicited reporting of CCM value	[+CAOC: <ccm>] OK/+CME ERROR: <err> When enable an unsolicited event reporting of the CCM information. The unsolicited result code +CCM: <ccm> is sent when the CCM value changes, but not more than every 10 seconds. <ccm>: string type; three bytes of the current call meter value in hexadecimal format (e.g. "00001E" indicates decimal value 30); value is in home units and bytes are similarly coded as ACMmax value in the SIM card or in the active application in the UICC (GSM or USIM)
+CAOC?	+CAOC: <mode> OK Example +CAOC: 1 OK
+CAOC=?	+CAOC: (0-2) OK

3.7.18 AT+VTS

Description

This command allows the transmission of DTMF tones.

Syntax

Command	Possible responses
+VTS=<DTMF>[, <duration>] Note: <DTMF>: DTMF string, up to 32 characters, valid	OK/+CME ERROR: <err>

character: (0, 1, ..., 9, A, B, C, D, *, #). <duration>: range (300-600)	
+VTS=?	+VTS: <DTMF>, (300-600) OK

3.7.19 AT\$VTS

Description

This command allows user decided DTMF sound play duration. When “Start” command with character parameter is sent, the UE start to play specific DTMF tone and send starting specific DTMF request to network. It stop by receiving correspond “Stop” command.

Syntax

Command	Possible responses
\$VTS=<DTMF>,<mode> Note: <DTMF>: DTMF character, valid character: (0, 1, ..., 9, *, #). <mode>: 0: stop DTMF sound 1: start DTMF sound	OK/+CME ERROR: <err> Example: \$VTS=1,1 OK \$VTS=1,0 OK
\$VTS=?	\$VTS: <DTMF>, (0,1) OK

3.7.20 AT+VTD

Description

This refers to an integer <n> that defines the length of tones emitted as a result of the +VTS command.

Syntax

Command	Possible responses
+VTD=<n> Note: n 300-600	OK/+CME ERROR: <err>
+VTD=?	+VTD: <n> OK
+VTD=?	+VTD: (300-600) OK

3.7.21 AT+CSSN

Description

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

Syntax

Command	Possible responses
+CSSN=<n>[,<m>] Note: <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	OK/+CME ERROR: <err> When <n>=1 and a supplementary service notification is received after a mobile-originated call setup, the +CSSI: <code1>[,<index>] notification is sent to the TE before any other mobile-originated call setup result codes. When several different notifications are received from the network, each of them receives its own +CSSI result code. When <m>=1 and a supplementary service notification is received during a mobile-terminated call setup or during a call, or when a forward check supplementary service notification is received, the unsolicited result code +CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] is sent to the TE. In case of a mobile-terminated call setup, a CSSU is sent after every +CLIP result code. When several different events are received from the network, each of them receives its own +CSSU result code.
+CSSN?	+CSSN: <n>,<m> OK
+CSSN=?	+CSSN: (0-1), (0-1) OK

+CSSI Notification values

<code1>: integer type

- 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>: integer type

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

+CSSU Notification values

<code2>: integer type

- 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 whenever)
- 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

<index>: integer type

0...9 CUG (Closed User Group) index

10 no index (preferred CUG taken from subscriber data)

<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

3.7.22 AT+CLCC

Description

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

Syntax

Command	Possible responses
+CLCC	[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]...]][(Note)] OK/+CME ERROR: <err> Note: This can also be an indication to list the current call information.
+CLCC=?	OK

Defined values

<idx>: integer type; call identification number as described in 3GPP TS 22.030 subclause 4.5.5.1; this number can be used in +CHLD command operations

<dir>:

0 mobile originated (MO) call

1 mobile terminated (MT) call

<stat> (state of the call):

0 active

1 held

2 dialing (MO call)

3 alerting (MO call)

4 incoming (MT call)

5 waiting (MT call)

6 offering(MT call)

<mode> (bearer/teleservice):

0 voice

1 data

2 fax

3 voice followed by data, voice mode

4 alternating voice/data, voice mode

5 alternating voice/fax, voice mode

6 voice followed by data, data mode

7 alternating voice/data, data mode

8 alternating voice/fax, fax mode

9 unknown

<mpty>:

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

1 call is one of multiparty (conference) call parties

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

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

129 Dialing string without international access code “+”

145 Dialing string includes international access code character “+”

<alpha>: 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

3.7.23 AT+PEER

Description

Requests the failure cause code for the most recently failed PDP context activate

Syntax

Command	Possible responses
AT+PEER	+PEER: <information text> OK
AT+PEER=?	OK

3.7.24 AT+CNUM

Description

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

Syntax

Command	Possible responses
+CNUM	+CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service>[,<itc>]] [...]] OK/+CME ERROR: <err>
+CNUM=?	OK

Defined values

<alpha>: optional alphanumeric string associated with <number>; used character set should be the one selected with command Select TE Character Set +CSCS

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

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

<speed>: as defined in subclause 3.5.4

<service> (service related to the phone number):

0 asynchronous modem

1 synchronous modem

2 PAD Access (asynchronous)

3 Packet Access (synchronous)

4 voice

5 fax

also all other values below 128 are reserved by the present document

<itc> (information transfer capability):

0 3,1 kHz

3.7.25 AT+CSQ

Description

Execution command returns received signal strength indication <rssi> and channel bit error rate <ber> from the MT.

Test command returns values supported as compound values.

Syntax

Command	Possible responses
+CSQ	+CSQ: <rssi>,<ber> OK/+CME ERROR: <err> Example: +CSQ:3,0 OK Note: this can also be an unsolicited result code to indicate signal quality.
+CSQ=?	+CSQ: (0-31),(0-7) OK

Defined values

<rssi>:

0 -113 dBm or less

1 -111 dBm

2...30 -109... -53 dBm

31 -51 dBm or greater

99 not known or not detectable

<ber> (in percent):

0...7 as RXQUAL values in the table in TS 45.008 subclause 8.2.4

99 not known or not detectable

3.7.26 AT+CDIP

Description

This command related to a network service that provides "multiple called numbers (called line identifications) service" to an MT. This command enables a called subscriber to get the called line identification of the called party when receiving a mobile terminated call. Set command enables or disables the presentation of the called line identifications at the TE.

Syntax

Command	Possible responses
---------	--------------------

+CDIP=<n>	OK/+CME ERROR:<err>
<p>Note:</p> <p><n>: parameter sets/shows the result code presentation status to the TE:</p> <p>0 disable 1 enable</p> <p><m>: parameter shows the subscriber "multiple called numbers" service status in the network:</p> <p>0 "multiple called numbers service" is not provisioned 1 "multiple called numbers service" is provisioned 2 unknown (e.g. no network, etc.)</p>	
+CDIP?	+CDIP: <n>,<m> OK Example: +CDIP: 1, 2 OK
+CDIP=?	+CDIP: (0-1) OK

3.7.27 AT+CPLS

Description

This command is used to select one PLMN selector with Access Technology list in the SIM card or active application in the UICC(GSM or USIM), that is used by +CPOL command.

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

Syntax

Command	Possible responses
+CPLS=[<list>]	OK/+CME ERROR: <err>
+CPLS?	+CPLS: <list> OK/+CME ERROR: <err> Example: +CPLS: 0 OK
+CPLS=?	+CPLS: (0-2) OK

Defined values:

<list>:

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}

2: HPLMN selector with Access Technology EF_{HPLMNwAct}

3.7.28 AT+COPN

Description

Execute command returns the operator name from the MT. operator code <numeric> that has an alphanumeric equivalent <alpha> in the MT memory shall be returned.

Syntax

Command	Possible responses
+COPN	+COPN: <numeric>,<alpha> OK

Defined values:

<numeric>: string type; operator in numeric format (see +COPS)

<alpha>: string type; operator in long alphanumeric format (see +COPS)

3.7.29 AT*BAND

Description

Set command controls parameters for GSM/UMTS/LTE user mode and optionally band settings.

The new parameters will be saved in NVM

UE will be reset to apply the new settings.

<mode>=0 forces the UE to search GSM network only, whereas

<mode>=1 forces the UE to search UMTS network only.

<mode>=2 returns the UE to dual mode and to default band settings.(auto)

<mode>=3 returns the UE to dual mode GSM preferred and to default band settings. (GSM prefer)

<mode>=4 returns the UE to dual mode UMTS preferred and to default band settings.(UMTS prefer)

<mode>=5 returns the UE to search LTE network only.

<mode>=6 returns the UE to dual mode(GSM and LTE) and to default band settings.(auto)

<mode>=7 returns the UE to dual mode(GSM and LTE) GSM preferred and to default band settings.(GSM prefer)

<mode>=8 returns the UE to dual mode(GSM and LTE) LTE preferred and to default band settings.(LTE prefer)

<mode>=9 returns the UE to dual mode(UMTS and LTE) and to default band settings.(auto)

<mode>=10 returns the UE to dual mode(UMTS and LTE) UMTS preferred and to default band settings.(UMTS prefer)

<mode>=11 returns the UE to dual mode(UMTS and LTE) LTE preferred and to default band settings.(LTE prefer)

<mode>=12 returns the UE to triple mode and to default band settings.(auto)

<mode>=13 returns the UE to triple mode GSM preferred and to default band settings. (GSM prefer)

<mode>=14 returns the UE to triple mode UMTS preferred and to default band settings. (UMTS prefer)
 <mode>=15 returns the UE to triple mode LTE preferred and to default band settings. (LTE prefer)
 <mode>=16 returns the UE to dual mode(GSM and LTE) DUALLINK and to default band settings.(DUALLINK)
 <mode>=17 returns the UE to dual mode(UMTS and LTE) DUALLINK and to default band settings.(DUALLINK)
 <mode>=18 returns the UE to triple mode DUALLINK(UMTS preferred for 2/3G link) and to default band settings.(DUALLINK)
 <gsmband> is a sum of integers each representing a GSM band.
 <umtsband> is a sum of integers each representing a UMTS band.
 <ltebandh> is a sum of integers each representing a TD LTE band.
 <ltebandl> is a sum of integers each representing a FDD LTE band.
 <roamingConfig>=0 forces the UE not support roaming.
 <roamingConfig>=1 forces the UE to support roaming.
 <roamingConfig>=2 means the UE should not change the roaming setting.
 <srvDomain>=0 forces the UE to change service to CS (circuit service) only.
 <srvDomain>=1 forces the UE to change service to PS (GPRS service) only.
 <srvDomain>=2 forces the UE to change service to CS and PS both.
 <srvDomain>=3 means let the UE choose a default service domain.
 <srvDomain>=4 means the UE should not change the service domain setting.
 <bandPriorityFlag>=0: default.
 <bandPriorityFlag>=1: set TD-LTE band preferred.
 <bandPriorityFlag>=2: set FDD-LTE band preferred.
 <isLteDualLink>=0: single link.
 <isLteDualLink>=1: dual link.

The default values of <roamingConfig> and <srvDomain> are 2 and 4.

The default value of <bandPriorityFlag> is 0, it only works if <mode> is LTE.

Read command returns the settings.

Syntax

Command	Possible responses
<pre>*BAND=<mode>,<gsmband>,<umtsband>,<ltebandh>,<ltebandl>[,<roamingConfig>[,<srvDomain>[,<bandPriorityFlag>[,<ltebandExt>]]]]]</pre> <p>Note: <mode>: integer type 0 GSM network 1 UMTS network 2 Dual mode(auto) 3 Dual mode(GSM preferred) 4 Dual mode(UMTS preferred) 5 LTE network 6 Dual mode(2G/4G)(auto) 7 Dual mode(2G/4G)(GSM preferred) 8 Dual mode(2G/4G)(LTE preferred)</p>	OK/+CME ERROR: <err>

<p>9 Dual mode(3G/4G)(auto) 10 Dual mode(3G/4G)(UMTS preferred) 11 Dual mode(3G/4G)(LTE preferred) 12 Triple mode(2G/3G/4G) (auto) 13 Triple mode(2G/3G/4G) (GSM preferred) 14 Triple mode(2G/3G/4G) (UMTS preferred) 15 Triple mode(2G/3G/4G) (LTE preferred) 16 Dual link (GSM/LTE) 17 Dual link(UMTS/LTE) 18 Dual link(GSM/UMTS/LTE) (UMTS preferred for 2/3G link)</p> <p><gsmband>: integer type If <mode> is set to GSM network, gsmband is a sum of integers each representing a GSM band (in other words bit mask)</p> <ul style="list-style-type: none"> 1 PGSM 900 (standard or primary) 2 DCS GSM 1800 4 PCS GSM 1900 8 EGSM 900 (extended) 16 GSM 450 32 GSM 480 64 GSM 850 <p><umtsband>: integer type If <mode> is set to UMTS network, umtsband is a sum of integers each representing a UMTS band (in other words bit mask)</p> <ul style="list-style-type: none"> 1 UMTS_BAND_1 2 UMTS_BAND_2 4 UMTS_BAND_3 8 UMTS_BAND_4 16 UMTS_BAND_5 32 UMTS_BAND_6 64 UMTS_BAND_7 128 UMTS_BAND_8 256 UMTS_BAND_9 <p><ltebandh>: integer type If <mode> is set to TD LTE network, ltebandh is a sum of integers each representing a TD LTE band (in other words bit mask)</p> <ul style="list-style-type: none"> 32 TDLTE_BAND_38 64 TDLTE_BAND_39 128 TDLTE_BAND_40 256 TDLTE_BAND_41 <p><ltebandl>: integer type If <mode> is set to FDD LTE network, ltebandl is a sum of integers each representing a FDD LTE band (in other words bit mask)</p> <ul style="list-style-type: none"> 1 FDDLTE_BAND_1 2 FDDLTE_BAND_2 4 FDDLTE_BAND_3 8 FDDLTE_BAND_4 16 FDDLTE_BAND_5 64 FDDLTE_BAND_7 4096 FDDLTE_BAND_13 65536 FDDLTE_BAND_17 524288 FDDLTE_BAND_20 <p><roamingConfig>: integer value 0 not support 1 support 2 no change</p> <p><srvDomain>: integer value 0 CS only 1 PS only</p>	
---	--

2 CS and PS 3 ANY 4 no change <bandPriorityFlag> 0: default 1: TD-LTE 2: FDD-LTE <isLteDualLink> 0: single link 1: dual link <ltebandExt> : integer type BAND65-BAND69	
*BAND?	*BAND :<mode>,<gsmBand>,<umtsBand>,<ltebandh>,<ltebandl>,<roamingConfig>,<srvDomain>,<bandPriorityFlag>,<isLteDualLink>,<ltebandExt> Note: If has used set command to set GSM band in GSM mode(AT*BAND=0,<gsm_band>), and current is in GSM mode, the queried GSM band will mask a GSM band lock 0x200.
*BAND=?	*BAND: (list of supported <mode>s),<gsm_band>,<umts_band>,<ltebandh>,<ltebandl>,<ltebandExt> OK/+CME ERROR: <err>

3.7.30 AT*BANDIND

Description

Indicates the current band

Syntax

Command	Possible responses
*BANDIND=[<n>] Note: <n>: 0: disable 1: enable	OK/+CME ERROR: <err> When enable band indications and the band changes, there will be indication *BANDIND: <band>, <Act> set from MT to TE. <band> refer to 3.12.5 <AcT> access technology selected: 0: GSM 1: GSM Compact 2: UTRAN 3: GSM w/EGPRS 4: UTRAN w/HSDPA 5: UTRAN w/HSUPA 6: UTRAN w/HSDPA and HSUPA 7: EUTRAN 8: UTRAN w/HSPA+ 9: E-UTRAN CA

*BANDIND?	*BANDIND: <n>[,<band>,<AcT>] OK
*BANDIND=?	*BANDIND: (0,1) OK

3.7.31 AT*EHSDPA

Description

This command is used to enable/disable HSDPA and HSUPA and choose the specific HSxPA category.

Syntax

Command	Possible responses
AT*EHSDPA=<mode>[,<DL_CATEGORY>[,<UL_CATEGORY>[,<CPC_STATE>[,<DPA_CATEGORY_EXT>[,<EDCH_CATEGORY_EXT>[,<F-DPCH State>[,<enhanced F-DPCH State>]]]]]]]	OK/+CME ERROR: <err>
*EHSDPA?	*EHSDPA:<mode>,<DL_CATEGORY>,<UL_C ATEGORY>,<CPC_STATE>,<DPA_CATEGORY_EXT>,<EDCH_CATEGOR Y_EXT>,<F-DPCH State >,<enhanced F-DPCH State>
*EHSDPA?	In TDSCDMA mode: *EHSDPA: (0-3),(1-11,13-16,23,35),(6),(0),(0),(0),(0),(0) OK In WCDMA mode: *EHSDPA: (0-2,4),(1-12),(1-6),(0,1),(1-14),(7),(0,1),(0,1) OK

Defined values:

<mode>:

- 0: disable HSDPA(also disable HSUPA if UE is supported) for Rel5
- 1: enable HSDPA(also Enable HSUPA if UE is supported) for Rel7
- 2: enable HSDPA only (not include HSUPA) for Rel5
- 3: enable DLDC for Rel9 for TD production
- 4: enable HSPA only for Rel6

<DL_CATEGORY>:DL category, for WCDMA support 1~64, default 10 for Rel7;support 1~15 except 12 on TD HSDPA, 16,23,35 on DLDC, default 15.

<UL_CATEGORY>:UL category, for WCDMA support 1~6, default 6; only support 6 on TD HSUPA, fix it if UPA is enabled.

<CPC_STATE>:CPC state only used for WCDMA Rel7, 0:disabled,1:enabled;
not supported on TD-SCDMA, hard coded with 0 or ignore it.

<DPA_CATEGORY_EXT>:DPA category ext, for WCDMA Rel7 support 1~20, default 14 for Rel7.<EDCH_CATEGORY_EXT>:EDCH category ext, for WCDMA Rel7 only support 7.

<F-DPCH State >:F-DPCH enabled or disabled on R6/R7 for WCDMA

In TD mode:

0(not supported, default value)

In WCDMA:

0 disabled
 1 enabled<enhanced F-DPCH State>:Enhanced F-DPCH enabled or disabled on R7 for WCDMA.
 In TD mode:
 0(not supported, default value)
 In WCDMA:
 0 disabled
 1 enabled

3.7.32 AT^SYSINFO

Description

This command is used to query current system information, for example: system service status, domain, roaming or not, etc.

Syntax

Command	Possible responses
^SYSINFO	<pre> ^SYSINFO:< srv_status >,< srv_domain >,< roam_status >,< sys_mode >,< sim_state > OK <srv_status>: 0 no service 1 restricted service 2 valid service 3 restricted area service 4 power saving <srv_domain>: 0 no service 1 CS only 2 PS only 3 CP and PS <roam_status>: 0 no roaming 1 roaming <sys_mode>: 0 no service 1 reserve 2 reserve 3 GSM/GPRS 4 WCDMA 5 TD_SCDMA 15 TD_SCDMA <sim_state>: 0 sim invalid 1 sim valid 255 sim not insert or PIN uncheck/unblocked </pre>

3.7.33 AT*REJCAUSE

Description

This proprietary AT command is used to enable/disable/query air interface reject cause indication. When enabled, The protocol stack will sends an air interface reject cause code indication due to errors that can occur during MM/GMM procedures such as

LU/RA update reject, authentication reject, etc. These reject codes are intended to enable vendors to give specific visual/audible feedback to the user.

Syntax

Command	Possible responses
*REJCAUSE=<mode> <mode>: 0 disable indication 1 enable indication 2 query history of last 10 times reject cause	OK/+CME ERROR:<err> When <mode>=1 and there is an error occur during MM/GMM procedures, the *REJCAUSE: <mmCause>, <gmmCause>, <emmCause> notification is sent to the TE. <mmCause>: indicate the reason why a MM request from the mobile station is rejected by the network. <gmmCause>: indicate the reason why a GMM request from the mobile station is rejected by the network. <emmCause>: indicate the reason why a EMM request from the mobile station is rejected by the network. Example: AT*REJCAUSE=1 OK
*REJCAUSE?	*REJCAUSE:<mode> OK
*REJCAUSE=?	*REJCAUSE: (0-2) OK

3.7.34 AT*Cell

Description

This proprietary AT command is used to requests to activate or to deactivate cell lock for GSM/UMTS/LTE network.

Syntax

Command	Possible responses
*CELL=<mode>,<act>,<band>,<freq>,<cellId> <mode>: 0 Cell/Frequency disabled 1 Frequency lock enabled 2 Cell lock enabled <act>: access technology 0 GSM 1 UMTS_TD 2 UMTS_W 3 LTE <band> for GSM: 0 PGSM 900 1 DCS GSM 1800 2 PCS GSM 1900 3 EGSM 900 (extended) 4 GSM 450	OK/+CME ERROR:<err>

<p>5 GSM 480 6 GSM 850 7 GSM750</p> <p><band> from UMTS: /*WB: 0~8, TD:0~7*/ 0: Band_1 arfcn 10562-10838 1: Band_2 9662-9938 2: Band_3 1162-1513 3: Band_4 1537-1738 4: Band_5 4357-4458 5: Band_6 4387-4413 6: Band_7 2237-2563 7: Band_8 2937-3088 8: Band_9 9237-9387</p> <p><band> for LTE: /*FDDLTE: 0~30; TDDLTE:32~43*/ 0-63: Band1~Band64</p> <p><freq>: Absolute radio frequency channel number</p> <p>GSM: UMTS-TD: arfcn range is 10054-10121 and 9404-9596, LTE, the range is 0-599, 1200-1949, 2400-2649, 2750-3449, 3450-3799, 5180-5279, 5730-5849, 6150-6449, 37750-38249, 38250-38649, 38650-39649, 39650-41589.</p> <p><cellId>: Cell parameter ID 2G: cell ID no needed as freq 3G: CELL ID: 0-127 4G: CELL ID: 0-503</p>	
*CELL?	*CELL: <mode>,<act>,< band>,<freq>,<cellId> OK

3.7.35 AT+CTZR

Description

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Syntax

Command	Possible responses
+CTZR?	+CTZR: 1 OK Note: 1, enable
+CTZR=?	OK

3.7.36 AT+CNEM

Description

Set command enables reporting of changes in the emergency bearer services support indicators.

Read command returns current command setting and if enabled, the settings of the emergency bearer services support indicator in Iu mode and the emergency bearer services support indicator in S1 mode for the network where the UE is attached.

Test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CNEM=[<reporting>]	+CME ERROR: <err>
+CNEM?	+CNEM: <reporting>[, <emb_Iu_supp>, <emb_S1_supp>]
+CNEM=?	+CNEM: (list of supported <reporting>s)

3.7.37 AT+CSSAC

Description

This command refers to SSAC (Service Specific Access Control) related information which is used by MMTEL application (see 3GPP TS 24.173). The command provides the current status of the parameters for SSAC, <BFVoice>, <BFVideo>, <BTVoice> and <BTVideo>. The AT command has no effect on the execution of SSAC.

Syntax

Command	Possible responses
+CSSAC	+CSSAC: <BFVoice>,<BFVideo>,<BTVoice>,<BTVideo>
+CSSAC=?	

3.7.38 AT+CTZU

Description.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Syntax

Command	Possible responses
+CTZU?	+CTZU: 1 OK Note: 1, enable
+CTZU=?	OK

3.7.39 AT*CTZR

Description

This proprietary AT command is used to query time zone information.

Syntax

Command	Possible responses
*CTZR?	*CTZR: <Year>/<Month>/<Day>,<Hour>:<Minute>:<Second><sign><time zone> OK/+CME ERROR:<err>

Defined values

<Year>: The int value is in range [00...99].

<Month>: The int value is in range [1...12].

<Day>: The int value is in range [1...31].

<Hour>: The int value is in range [0...59]

<Minute>: The int value is in range [0...59]

<Second>: The int value is in range [0...59]

<sign>: a char value

'+' – local time zone is passive.

'-' – local time zone is negative.

<time zone>: time zone

Note: The example when use this AT command is as following:

AT*CTZR?

*CTZR:11/5/27,2:46:36+32

OK

3.7.40 AT+CESQ

Description

Execution command returns received signal quality parameters. If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99. If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> is set to 255. If the current serving cell is not a UTRA FDD cell, <ecno> is set to 255. If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.

Syntax

Command	Possible responses
+CESQ	+CESQ: <rssi>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> OK
+CESQ=?	+CESQ: (range of supported <rssi>s),(range of

	supported <ber>s), (range of supported <rscp>s), (range of supported <ecno>s), (range of supported <rsrq>s), (range of supported <rsrp>s) OK
--	---

Defined values

<rxlev>: integer type, received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).

- 0 rssi < -110 dBm
- 1 -110 dBm ≤ rssi < -109 dBm
- 2 -109 dBm ≤ rssi < -108 dBm
- : : : :
- 61 -50 dBm ≤ rssi < -49 dBm
- 62 -49 dBm ≤ rssi < -48 dBm
- 63 -48 dBm ≤ rssi
- 99 not known or not detectable

<ber>: integer type; channel bit error rate (in percent)

- 0...7 as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
- 99 not known or not detectable

<rscp>: integer type, received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3).

- 0 rscp < -120 dBm
- 1 -120 dBm ≤ rscp < -119 dBm
- 2 -119 dBm ≤ rscp < -118 dBm
- : : : :
- 94 -27 dBm ≤ rscp < -26 dBm
- 95 -26 dBm ≤ rscp < -25 dBm
- 96 - 25 dBm ≤ rscp
- 255 not known or not detectable

<ecno>: integer type, ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause).

- 0 Ec/Io < -24 dB
- 1 -24 dB ≤ Ec/Io < -23.5 dB
- 2 -23.5 dB ≤ Ec/Io < -23 dB
- : : : :

47 $-1 \text{ dB} \leq \text{Ec/Io} < -0.5 \text{ dB}$

48 $-0.5 \text{ dB} \leq \text{Ec/Io} < 0 \text{ dB}$

49 $0 \text{ dB} \leq \text{Ec/Io}$

255 not known or not detectable

<rsrq>: integer type, reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7).

0 $\text{rsrq} < -19.5 \text{ dB}$

1 $-19.5 \text{ dB} \leq \text{rsrq} < -19 \text{ dB}$

2 $-19 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$

: : : :

32 $-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$

33 $-3.5 \text{ dB} \leq \text{rsrq} < -3 \text{ dB}$

34 $-3 \text{ dB} \leq \text{rsrq}$

255 not known or not detectable

<rsrp>: integer type, reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4).

0 $\text{rsrp} < -140 \text{ dBm}$

1 $-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$

2 $-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$

: : : :

95 $-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$

96 $-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$

97 $-44 \text{ dBm} \leq \text{rsrp}$

255 not known or not detectable

3.7.41 AT+BGLTEPLMN

Description

This command is used to set cell background searching.

Syntax

Command	Possible responses
+BGLTEPLMN?	+ BGLTEPLMN: <stat>,<interval>

	OK/+CME ERROR: <err> Example: + BGLTEPLMN: 0,30 OK
+BGLTEPLMN=<stat>,<interval> Note: < stat > TRUE : enabled FALSE: disabled <interval> 0 search immediately 0xFFFF don't search Other values between 1 and 0xFFFF back ground search with seconds.	+ BGLTEPLMN: OK! OK/ +CME ERROR: <err>
+BGLTEPLMN=?	[list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,< AcT>])s][,(list of supported <mode>s),(list of supported <format>s)] OK/+CME ERROR:<err>

3.7.42 AT^CACAP

Description

Use this command to get the access technology of the serving cell.

. Syntax

Command	Possible responses
^CACAP=?	^CACAP:(0-7) OK
^CACAP?	^CACAP: <act> OK /+CME ERROR: <err>

Defined Values

- <act>:
- 0 GSM
- 1 GSM Compact
- 2 UTRAN
- 3 GSM w/EGPRS
- 4 UTRAN w/HSDPA
- 5 UTRAN w/HSUPA
- 6 UTRAN w/HSDPA and HSUPA
- 7 E-UTRAN
- 8 UTRAN w/HSPA+

3.7.43 AT+WS46

Description

Use this command to select the cellular network (Wireless Data Service: WDS) to operate with the TA. Set command selects the WDS side stack <n> to be used by the TA. Read command shows current setting and test command displays side stacks implemented in the TA.

. Syntax

Command	Possible responses
+WS46=<n>	OK/+CME ERROR:<err>
+WS46?	+WS46: <n> OK/+CME ERROR:<err>
+WS46=?	(list of supported <n>s)

Defined Values

<n>: integer type

12 GSM Digital Cellular Systems (GERAN only)

22 UTRAN only

25 3GPP Systems (GERAN, UTRAN and E-UTRAN)

28 E-UTRAN only

29 GERAN and UTRAN

30 GERAN and E-UTRAN

31 UTRAN and E-UTRAN

The values in <n> for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned.

3.7.44 Unsolicited result code: +NITZ

Description

NITZ, or Network Identity and Time Zone, is a mechanism for provisioning local time and date information to mobile devices via a wireless network

Syntax

+NITZ:<DST>[,<sign><timezone>[,<year>/<month>/<day>,<hour>:<minute>:<second>]]

Defined Values

<year>/<month>/<day>: string type

<year>: The integer value is in range [00...99].
<month>: The integer value is in range [1...12].
<day>: The integer value is in range [1...31].

<hour>:<minute>:<second>: string type

<hour>: The integer value is in range [0...59]
<minute>: The integer value is in range [0...59]
<second>: The integer value is in range [0...59]

<sign><timezone>: string type

<sign>: a char value
‘+’ – local time zone is passive.
‘-’ – local time zone is negative.
<time zone>: time zone

<DST>: Daylight Saving Time (DST), also summer time.

0	no adjustment
1	+1 hour
2	+2 hour

Example:

+NITZ: 0,"+32","11/08/02","09:27:39"

3.7.45 Unsolicited result code: *COPN

Description

Indication of network provider identity information.

Syntax

*COPN:<format>,<oper>

Defined Values

<format>: 0 long format alphanumeric <oper>
1 short format alphanumeric <oper>

<oper>: string type; <format> indicates if the format is long alphanumeric format or short alphanumeric format; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13)

Example:

*COPN: 0, "CHINA MOBILE"

*COPN: 1, "CMCC"

3.7.46 Unsolicited result code: ^MODE

Description

Indicates that system mode has changed..

Syntax

`^MODE: <sys_mode>`

Defined Values

< sys_mode >:	system mode
0	no service
1	reserved
2	reserved
3	GSM/GPRS
4	WCDMA
5	TD_SCDMA

3.7.47 AT*CSQ

Description

This proprietary AT command is used to configure the unsolicited signal quality indications mode.

Syntax

Command	Possible responses
<code>AT*CSQ=<option>,<configure></code> <option> 0, Periodic mode. 1, RSSI threshold mode. 2, Disable indications <configure>: If <option> is 0, it's time interval in 100ms units. If <option> is 1, it's RSSI threshold in dBm.	<code>OK/+CME ERROR:<err></code>
<code>*CSQ?</code>	<code>*CSQ=<option>,<configure></code> <code>OK/+CME ERROR:<err></code>
<code>*CSQ=?</code>	<code>*CSQ:(0-2),(0-65535)</code> <code>OK</code>

3.7.48 AT*URSLCT

Description

This proprietary AT command is used to trigger user PLMN selection.

Syntax

Command	Possible responses
<code>*URSLCT</code>	<code>OK/+CME ERROR:<err></code>

3.7.49 AT*DIALMODE

Description

This command is used to enable/disable usbnetwork function

Syntax

Command	Possible responses
AT*DIALMODE=mode	OK/+CME ERROR:<err>
AT*DIALMODE ?	* DIALMODE :<mode>
AT* DIALMODE =?	* DIALMODE: (list of supported <mode>s)

Defined values

<mode>: integer type

0: disable

1: enable

3.7.50 AT+ZDON

This command is used to display the current operator, including the name and PLMN.
This command can just be used as read command (i.e. AT+ZDON?).

When the operator changes, the new operator information is routed to TE using unsolicited code.

Syntax

Command	Possible responses
+ZDON?	+ZDON: <RPLMN>,<RMCC>,<RMNC>,<HPLMN>,<HMCC>,<HMNC>,<ROAM_STATUS> OK/+CME ERROR:<err>

Defined Values

<RPLMN>: string type, the name of local operator

<RMCC>: string type, the MCC of local operator

<RMNC>: string type, the MNC of local operator

<HPLMN>: string type, the name of attributive operator

<HMCC>: string type, the MCC of attributive operator

<HMNC>: string type, the MNC of attributive operator

<ROAM_STATUS>: string type

ROAM_NONE

ROAM_OFF

ROAM_ON

Example:

AT+ZDON?

+ZDON: "China Mobile","460","00","China Mobile","460","00","ROAM_OFF"

OK

3.7.51 AT*ASRCOPS

Description

Get the current mode, the currently selected operator in numeric format and the current Access Technology, if both CS/PS have operator info, CS is preferred.

Syntax

Command	Possible responses
*ASRCOPS?	*ASRCOPS: <mode>[,<format_1>,<oper>,<format_2>,<oper_alpha>,<AcT>] OK/+CME ERROR: <err> <format_1>: fixed to 2 <format_2>: fixed to 1 Refer to AT+COPS to get the description of parameters Example: *ASRCOPS: 0,2,"46001",1,"UNICOM",7 OK

3.7.52 AT*REGMODE

Description

Get the current registration mode.

Syntax

Command	Possible responses
*REGMODE	*REGMODE: <mode> OK/+CME ERROR: <err> Refer to AT+COPS to get the description of <mode>
AT*REGMODE =?	*REGMODE: (list of supported <mode>s)

3.7.53 AT*ZPAS

Description

This command is used to check card status, including the type of current network and service domain. This command can just be used as read command (i.e. AT*ZPAS?).

Syntax

Command	Possible responses
*ZPAS?	*ZPAS: <network>, <srv_domain> OK/+CME ERROR:<err>

Defined Values

<network>: string type, the type of current network

No Service

Limited Service
 EDGE
 GPRS
 GSM
 HSDPA
 HSUPA
 HSPA+
 UMTS
 LTE
 LTE_A
 <srv_domain>: string type, service domain
 CS_ONLY: CS domain service available.
 PS_ONLY: PS domain service available.
 CS_PS: CS&PS domain service available.
 CAMPED: camped in a cell.

Example:

```

AT+ZPAS?  

+ZPAS: "GPRS","CS_PS"  

OK
  
```

3.8 Mobile Control and Status Commands

3.8.1 AT+CPAS

Description

Execution command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone.

Test command returns values supported by the MT as a compound value.

Syntax

Command	Possible responses
+CPAS	+CPAS: <pas> OK/+CME ERROR: <err> Example: +CPAS: 2 OK

+CPAS=?	+CPAS: (0,1,2,3,4,5,6) OK
---------	------------------------------

Defined values

<pas>:

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

3.8.2 AT+CFUN

Description

Set command selects the level of functionality <fun> in the MT.

Syntax

Command	Possible responses
+CFUN=[<fun>[,<rst>]] Note: <fun> 0: minimum functionality 1: full functionality 3: disable phone receive RF circuits 4: disable phone both transmit and receive RF circuits 5: disable SIM 6: second RX off <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	OK/+CME ERROR: <err>
+CFUN?	+CFUN: <fun> OK/+CME ERROR: <err> Example: +CFUN: 1 OK
+CFUN=?	+CFUN: (0,1,3,4,5,6),(0-1) OK

3.8.3 AT*CFUN

Description

Set phone functionality status

Syntax

Command	Possible responses
AT*CFUN=<fun>[,<rst>,<isFeatureCfg>,<featureCfg>] Note: <fun>: 0: minimum functionality 1: full functionality 3: disable phone receive RF circuits 4: disable phone both transmit and receive RF circuits 5: update NVM file with minimum functionality mode 6: update NVM file with full functionality mode 9: update NVM file with both transmit and receive RF circuits disable mode <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 <isFeatureCfg> 0: < featureCfg > is not present 1: < featureCfg > is present < featureCfg > 0-63: bitmap for comm. Configurations for CSD, FAX, PRODUCTION, CONVENTIONAL_GPS, MS_BASED_GPS, MS_ASSISTED_GPS	OK/+CME ERROR: <err>
AT*CFUN?	*CFUN : <func>, < featureCfg> OK
AT*CFUN=?	*CFUN: (0,1,3,4,5,6,9),(0-1),(0,1),(0-63) OK

3.8.4 AT+OFF

Description

This proprietary AT command is used to make device in minimum functionality but without IMSI detach.

Syntax

Command	Possible responses
+OFF	OK/+CME ERROR:<err>

Note:

This command is similar to AT+CFUN=0, but without IMSI detach.

3.8.5 AT+CPIN

Description

Set command sends to the MT 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 MT and an error message, +CME ERROR, is returned to TE.

Syntax

Command	Possible responses
+CPIN=<pin>[,<newpin>]	OK/+CME ERROR: <err>
+CPIN?	+CPIN: <code> (Note) OK/+CME ERROR: <err> Example: +CPIN: READY OK Note: +CPIN: <code> can also be unsolicited result code sent from MT to TE when current SIM status changed.
+CPIN=?	OK

Defined values

<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-SIMLOCK PIN	MT is waiting phone-to-SIM card password to be given
PH-SIMLOCK PUK	MT is waiting phone-to-SIM card unblocking 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 (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation)
SIM PUK2	MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation)
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-NETSUB PUK	MT is waiting network subset personalization unblocking password to be given
PH-SP PIN	MT is waiting service provider personalization password to be given

PH-SP PUK 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

3.8.6 AT+CPIN2

Description

Verify PIN2 anytime after PIN ready not only in the case that PIN2 is required.

Syntax

Command	Possible responses
AT+CPIN2=<pin2> Note: <pin2>:SIM PIN2, string type values	OK/+CME ERROR: <err> Exmaple: AT+CPIN2=12345 OK
AT+CPIN2?	+CPIN: <code> OK/+CME ERROR: <err> <code>:refer to 3.8.4 Example: +CPIN: READY OK
AT+CPIN2=?	OK

3.8.7 AT+EPIN

Description

Get PIN's number of remaining retry.

Syntax

Command	Possible responses
AT+EPIN? Note: <p1 retry>: P1 status, number of remaining retries <p2 retry>: P2 status, number of remaining retries <puk1 retry>: PUK1 status, number of remaining retries <puk2 retry>: PUK2 status, number of remaining retries	+EPIN: <p1 retry>,<p2 retry>,<puk1 retry>,<puk2 retry> OK Example: +EPIN: 3,3,10,10 OK
AT+EPIN=?	+EPIN: (0-3),(0-3),(0-10),(0-10) OK

3.8.8 AT*EPIN

Description

Get MEP's number of remaining retry.

Syntax

Command	Possible responses
AT*EPIN? Note: <SIM MEP retry>: SIM MEP status, number of remaining retries <Network MEP retry>: Network MEP status, number of remaining retries <Sub Network MEP retry>: Sub Network MEP status, number of remaining retries <Service Provider MEP retry>: Service Provider MEP status, number of remaining retries <Corporate MEP retry>: Corporate MEP status, number of remaining retries	*EPIN: <SIM MEP retry>,<Network MEP retry>,<Sub Network MEP retry>,<Service Provider MEP retry>, <Corporate MEP retry> OK Example: *EPIN: 10,10,10,10,10 OK
AT*EPIN=?	*EPIN: (0-10), (0-10),(0-10),(0-10), (0-10) OK

3.8.9 Unsolicited result code: +MSRI

Description

Notification of allowing/disallowing Manual PLMN selection option in the user menu. The protocol stack sends an indication regarding whether manual PLMN selection appearance in the user's menu. The decision regarding allowing / disallowing the appearance of this option in the user's menu is done by SIM.

Syntax

+MSRI: <ind>

Defined Values

<ind>: indicate if allow manual PLMN selection option in the user menu

0 not allowed

1 allowed

Example:

+MSRI: 0

3.8.10 AT+CPBS

Description

Set command selects phonebook memory storage <storage>, which is used by other phonebook commands.

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

Test command returns supported storages as compound value.

Syntax

Command	Possible responses
+CPBS=<storage>[,<password>]	OK/+CME ERROR: <err>
+CPBS?	+CPBS: <storage>,<used>,<total> OK/+CME ERROR: <err> Example: +CPBS:"SM",2,200 OK Note: If some platform, we will use below format: +CPBS: <storage>,<used>,<total>,<firstIndex>[<PB info type>, <total entries>, <max length>, <used entries>[, <PB info type>, <total entries>, <max length>, <used entries>[, <PB info type>, <total entries>, <max length>, <used entries>[.....]]]] <PB info type>: string type, indicate which field "Name" "Number" "Additional Number 1" "Additional Number 2" "Additional Number 3" "Additional Number 4" "Email 1" "Email 2" "Email 3" "Email 4" "Secondary name entry" "Group 1" "Phone Book Control" "Not Define" <total entries>: integer type value indicating the total number of locations in selected memory <max length>: integer type value indicating the max length of this field <used entries>: integer type value indicating the number of used locations in selected memory Example: Field value definition: 1: NAME / total 300 fields, max length is 14, 2 used 2: NUMBER / total 300 fields, max length is 40, 2 used 3: ANR / total 300 fields, max length is 40, 2 used 4: ANR1 / total 300 fields, max length is 40, 2 used 5: ANR2 / total 300 fields, max length is 40, 2 used 6: ANR3 / total 300 fields, max length is 40, 2 used 7: EMAIL1 / total 200 fields, max length is 38, 2 used 8: EMAIL2 / total 200 fields, max length is 38, 2 used 9: EMAIL3 / total 200 fields, max length is 38, 2 used 10: EMAIL4 / total 200 fields, max length is 38, 2 used AT+CPBS?

	+CPBC:"SM",300,2,5,"Name", 300, 14, 2, "Number", 300, 40, 2, "Additional Number 1", 300, 40, 2, "Additional Number 2", 200, 38, 2, "Additional Number 3", 300, 40, 2, "Additional Number 4", 300, 40, 2, "Email1", 200, 38, 2, "Email2", 200, 38, 2, "Email3", 200, 38, 2, "Email4", 200, 38, 2 OK
+CPBS=?	+CPBS: (list of supported <storage>s) OK

Defined values

<storage> values reserved by the present document:

- "DC" MT dialled calls list (+CPBW may not be applicable for this storage)
- "EN" SIM/USIM (or MT) emergency number (+CPBW is not be applicable for this storage)
- "FD" SIM/USIM fixdialling-phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the information in EF_{FDN} under DF_{Telecom} is selected. If a UICC with an active USIM application is present, the information in EF_{FDN} under ADF_{USIM} is selected.
- "LD" SIM/UICC last-dialling-phonebook
- "MC" MT missed (unanswered received) calls list (+CPBW may not be applicable for this storage)
- "ME" MT phonebook
- "MT" combined MT and SIM/USIM phonebook
- "ON" SIM (or MT) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also). When storing information in the SIM/UICC, if a SIM card is present or if a UICC with an active GSM application is present, the information in EF_{MSISDN} under DF_{Telecom} is selected. If a UICC with an active USIM application is present, the information in EF_{MSISDN} under ADF_{USIM} is selected.
- "RC" MT received calls list (+CPBW may not be applicable for this storage)
- "SM" SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the EF_{ADN} under DF_{Telecom} is selected. If a UICC with an active USIM application is present, the global phonebook, DF_{PHONEBOOK} under DF_{Telecom} is selected.
- "AP" Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DF_{PHONEBOOK} under ADF_{USIM} is selected.
- "MBDN" SIM card CPHS MBDN.
- "MN" SIM card CPHS MN.
- "SDN" Service Dialling Number
- "ICI" Incoming call information
- "OCI" Outgoing call information

3.8.11 AT+CPBR

Description

Execution command returns phonebook entries in location number range <index1>...<index2> from the current phonebook memory storage selected with +CPBS.

Test command returns location range supported by the current storage as a compound value and the maximum lengths of <number> fields.

Syntax

Command	Possible responses
+CPBR=<index1>[,<index2> Example: AT+CPBR=7	[+CPBR:<index>,<NextIndex>,<number>,<type>,<text>,[<Email1>],[<Email2>],[<Email3>],[<Email4>],[<ANR1>],[<ANR1_Type>],[<ANR2>],[<ANR2_Type>],[<ANR3>],[<ANR3_Type>],[<ANR4>],[<ANR4_Type>]]<CR><LF> [+CPBR:<index>,<number>,<type>,<text>,[<Email1>],[<Email2>],[<Email3>],[<Email4>],[<ANR1>],[<ANR1_Type>],[<ANR2>],[<ANR2_Type>],[<ANR3>],[<ANR3_Type>],[<ANR4>],[<ANR4_Type>]]<CR><LF>[...]] OK/+CME ERROR: <err> <NextIndex>: integer type, indicate next valid entry index. <ANRX>: string type, additional number. <ANRX_Type>: integer type, type of additional number. <EmailX>: string type, email address. Example: Fields value definition : Index = 1; NextIndex = 5 ; Number = "1111"; Text = "Bill Gates" Email1 = a@email.com Email2 = Email3 = Email4 = ANR1 = "2222" ANR2 = "3333" ANR3 = "4444" ANR4 = "5555" Command example: +CPBR=1 +CPBR:1,5,"1111",129,"Bill Gates","a@email.com",,"2222",129,"3333",129,"4444",12 9,"5555",129 OK
+CPBR=?	+CPBR: (list of supported <index>s),[<nlength>] OK/+CME ERROR: <err>

3.8.12 AT+CPBW

Description

Execution command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS.

Test command returns location range supported by the current storage as a compound value, the maximum length of <number> field, supported number formats of the storage.

Syntax

Command	Possible responses
+CPBW=[<index>][,<number> [,<type>[,<text>]]] Note: If some platform, we will use below format: +CPBW=[<index>][,<number> [,<type>[,<text>,[<isHidden>],[<GroupName>],[<ANR1>],[<ANR1_Type>],[<ANR1_CategIndex>],[<ANR2>],[<ANR2_Type>],[<ANR2_CategIndex>],[<ANR3>],[<ANR3_Type>],[<ANR3_CategIndex>],[<ANR4>],[<ANR4_Type>],[<ANR4_CategIndex>],[<Email1>],<Email2>],[<Email3>],[<Email4>] <isHidden>: integer type 1: this entry is hidden 0: this entry is not hidden <GroupName>: string type, group name. <ANRX>: string type, additional number. <ANRX_Type>: integer type, type of additional number. <ANRX_CategIndex>: integer type, category index of additional number. <EmailX>: string type, email address. Example: Field value definition: Number = "1111"; Text = "Name 1"; ANR1 = "2222"; ANR2 = "3333"; ANR3 = "4444"; ANR4 = "5555"; Email1 = "a@email.com" Email2 = "b@email.com" Command example: AT+CPBW=2,"1111",129,"Name 1",,, "2222",129,,,"3333",129,,,"4444",129,,,"5555",1 29,,,"a@email.com",,"b@email.com" +CPBW:40 OK +CPBW=?	+CPBW:<index> OK/+CME ERROR: <err>
	+CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s) OK/+CME ERROR: <err> Example: +CPBW:(1-2),40,(129,145) OK

3.8.13 AT+CPBF

Description

Execution command returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field starts with string <findtext>. Test command returns the maximum lengths of <number> fields.

Syntax

Command	Possible responses
+CPBF=<findtext>	[+CPBF:<index>,<NextIndex>,<number>,<type>,<text>,[<Email1>],[<Email2>],[<Email3>],[<Email4>],[<ANR1>],[<ANR1_Type>],[<ANR2>],[<ANR2_Type>],[<ANR3>],[<ANR3_Type>],[<ANR4>],[<ANR4_Type>]<CR><LF> [+CPBF:<index>,<number>,<type>,<text>,[<Email1>],[<Email2>],[<Email3>],[<Email4>],[<ANR1>],[<ANR1_Type>],[<ANR2>],[<ANR2_Type>],[<ANR3>],[<ANR3_Type>],[<ANR4>],[<ANR4_Type>]<CR><LF>[....]]] OK/+CME ERROR: <err> <NextIndex>: integer type, indicate next valid entry index. <ANR>: string type, additional number. <ANR_Type>: integer type, type of additional number. <EmailX>: string type, email address. Example: Fields value definition : Index = 1; NextIndex = 5 ; Number = "1111"; Text = "Bill Gates" Email1 = a@email.com Email2 = Email3 = Email4 = ANR1 = "2222" ANR2 = "3333" ANR3 = "4444" ANR4 = "5555" Command example: +CPBF="Bill" +CPBF:1,5,"1111",129,"Bill Gates","a@email.com",,,,"2222",129,"3333",129,"4444",129,"5555",12 9 OK
+CPBF=?	OK/+CME ERROR: <err>

3.8.14 AT+MPBK

Description

The execution command returns the status of SIM and/or NVRAM phonebooks

Syntax

Command	Possible responses

AT+MPBK	+CEDRXRDP: <ready> OK/+CME ERROR:<err>
---------	---

Defined values

Refer to below +MPBK indication parameters

3.8.15 Unsolicited result code: +MPBK

Description

ASR extended AT command to indicate that the SIM and/or NVRAM phonebooks are ready to use

Syntax

+MPBK: <bReady>

Defined Values

< bReady >: indicate whether SIM and/or NVRAM phonebooks are ready to use

1	ready
0	not ready

Example

+MPBK: 1

3.8.16 AT*CPBC

Description

This proprietary AT command is used to read the SIM/USIM phonebook capabilities supported by the selected phonebook.

Syntax

Command	Possible responses
AT*CPBC	<p>*CPBC:<PB info type>, <total entries>, <max length>, <used entries>[, <PB info type>, <total entries>, <max length>, <used entries>[, <PB info type>, <total entries>, <max length>, <used entries>[.....]]]</p> <p><PB info type>: string type, indicate which field "Name" "Number" "Additional Number 1" "Additional Number 2" "Additional Number 3" "Additional Number 4" "Email 1" "Email 2" "Email 3" "Email 4" "Secondary name entry" "Group 1" "Phone Book Control" "Not Define"</p> <p><total entries>: integer type value indicating the total</p>

	<p>number of locations in selected memory <max length>: integer type value indicating the max length of this field <used entries>: integer type value indicating the number of used locations in selected memory</p> <p>Example: Field value definition: 1: NAME / total 300 fields, max length is 14, 2 used 2: NUMBER / total 300 fields, max length is 40, 2 used 3: ANR / total 300 fields, max length is 40, 2 used 4: ANR1 / total 300 fields, max length is 40, 2 used 5: ANR2 / total 300 fields, max length is 40, 2 used 6: ANR3 / total 300 fields, max length is 40, 2 used 7: EMAIL1 / total 200 fields, max length is 38, 2 used 8: EMAIL2 / total 200 fields, max length is 38, 2 used 9: EMAIL3 / total 200 fields, max length is 38, 2 used 10: EMAIL4 / total 200 fields, max length is 38, 2 used</p> <p>AT*CPBC *CPBC:"Name", 300, 14, 2, "Number", 300, 40, 2, "Additional Number 1", 300, 40, 2, "Additional Number 2", 200, 38, 2, "Additional Number 3", 300, 40, 2, "Additional Number 4", 300, 40, 2, "Email1", 200, 38, 2, "Email2", 200, 38, 2, "Email3", 200, 38, 2, "Email4", 200, 38, 2 OK</p>
AT*CPBC=?	*CPBC OK

3.8.17 AT*FDNBYPASS

Description

This proprietary AT command is used to bypass FDN check only once for MO call/SMS.

Syntax

Command	Possible responses
AT*FDNBYPASS	OK/+CME ERROR:<err> Example: AT*FDNBYPASS OK
AT*FDNBYPASS=?	*FDNBYPASS: OK

3.8.18 AT+CSIM

Description

Set command transmits to the MT the SIM command it then shall send as it is to the SIM.

This command allows a direct control of the SIM by a distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS.

Syntax

Command	Possible responses
+CSIM=<length>,<command>	+CSIM: <length>,<response> OK/+CME ERROR: <err>
+CSIM=?	OK

Defined values

<length> : integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response)

<command> : command passed on by the MT to the SIM in the format as described in GSM 51.011 (hexadecimal character format; refer +CSCS)

<response> : response to the command passed on by the SIM to the MT in the format as described in GSM 51.011 (hexadecimal character format; refer +CSCS)

A command APDU has the following general format:

CLA	INS	P1	P2	P3	Data
-----	-----	----	----	----	------

The response APDU has the following general format:

Data	SW1	SW2
------	-----	-----

The bytes have the following meaning:

- CLA is the class of instruction, 'A0' is used in the GSM application;
- INS is the instruction code for each command.
- P1, P2, P3 are parameters for the instruction. P1, P2, P3 are parameters for the instruction. They are specified in below table. 'FF' is a valid value for P1, P2 and P3. P3 gives the length of the data element. P3='00' introduces a 256 byte data transfer from the SIM in an outgoing data transfer command (response direction). In an incoming data transfer command (command direction), P3='00' introduces no transfer of data;
- SW1 and SW2 are the status words indicating the successful or unsuccessful outcome of the command.

Coding of the commands

[1] COMMAND	[2] I NS	[3] P1	[4] P2	[5] P 3	[6] S /R
SELECT STATUS	'A4' 'F2'	'00' '00'	'00' '00'	'02' lgth	S/R R
READ BINARY	'B0'	offset high	offset low	lgth	R
UPDATE BINARY	'D6'	offset high	offset low	lgth	S
READ RECORD	'B2'	rec No.	mode	lgth	R
UPDATE RECORD	'DC'	rec No.	mode	lgth	S
SEEK	'A2'	'00'	type/mode	lgth	S/R
INCREASE	'32'	'00'	'00'	'03'	S/R
VERIFY CHV	'20'	'00'	CHV No.	'08'	S
CHANGE CHV	'24'	'00'	CHV No.	'10'	S
DISABLE CHV	'26'	'00'	'01'	'08'	S
ENABLE CHV	'28'	'00'	'01'	'08'	S
UNBLOCK CHV	'2C'	'00'	see note2	'10'	S
INVALIDATE	'04'	'00'	'00'	'00'	-
REHABILITATE	'44'	'00'	'00'	'00'	-
RUN GSM ALGORITHM	'88'	'00'	'00'	'10'	S/R
SLEEP	'FA'	'00'	'00'	'00'	-
GET RESPONSE	'C0'	'00'	'00'	lgth	R
TERMINAL PROFILE	'10'	'00'	'00'	lgth	S
ENVELOPE	'C2'	'00'	'00'	lgth	S/R
FETCH	'12'	'00'	'00'	lgth	R
TERMINAL RESPONSE	'14'	'00'	'00'	lgth	S

NOTE1: The direction of the data is indicated by (S) and (R), where (S) stands for data sent

by the ME while (R) stands for data received by the ME.

NOTE2: If the UNBLOCK CHV command applies to CHV1 then P2 is coded '00'; if it applies to CHV2 then P2 is coded '02'.

Note: for detail information, please refer to 3GPP TS 11.11

Below demonstrate a example to use CSIM read the IMSI

AT+CSIM=14,A0A40000023F00 //first use "SELECT" command(INS is A4) to

select master file of GSM, file ID is 3F00

+CSIM:48,000000003F00010000000000099301020400838A838A9000 //the end two bytes 9000 mapping SW1 and SW2 show the correctly executed of command

AT+CSIM=14,A0A40000026F07 //then use "SELECT" command to select element

//file EF_{IMSI} that contain IMSI, file ID is 6F07

+CSIM:34,000000096F07040014FF14010200009000

AT+CSIM=10,A0B0000009 //use “READ BINARY”
 command(INS is B0) to read the IMSI
 +CSIM:22,0849060057432199449000

3.8.19 AT+CRSM

Description

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM command and its required parameters.

Syntax

Command	Possible responses
+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	+CRSM: <sw1>,<sw2>[,<response>] OK/+CME ERROR: <err>
+CRSM=?	+CRSM: (176,178,192,214,220,242),(12037-28599),(0-255),(0-255),(0-255),<data>,<pathid> OK

Defined values

<command> (command passed on by the MT to the SIM; refer GSM 51.011):

176 READ BINARY

178 READ RECORD

192 GET RESPONSE

214 UPDATE BINARY

220 UPDATE RECORD

242 STATUS

all other values are reserved

NOTE 1: The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.

<fileid>: integer type; this is the identifier Mandatory for every command except STATUS

NOTE 2: The range of valid file identifiers depends on the actual SIM and is defined in GSM 51.011 . Optional files may not be present at all.

<P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011

READ BINARY

<P1> Offset high (0...255)
 <P2> Offset low (0...255)

<P3> Length (0...255)

READ RECORD

<P1> Rec. No. (0...255)

<P2> Mode "02" = next record
 "03" = previous record
 "04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record.
<P3> Length (0...255)
GET RESPONSE
<P1> "00"
<P2> "00"
<P3> Length (0...255)

UPDATE BINARY
<P1> Offset high (0...255)
<P2> Offset low (0...255)
<P3> Length (0...255)
UPDATE RECORD
<P1> Rec. No. (0...255)
<P2> Mode "02" = next record
 "03" = previous record
 "04" = absolute mode/current mode, the record number is given in P1 with P1='00' denoting the current record.
<P3> Length (0...255)
STATUS
<P1> "00"
<P2> "00"
<P3> Length (0...255)

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

NOTE 3: 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. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

Responses to commands which are correctly executed:					
<sw1>	<sw2>	Description			
144	0	Normal ending of the command			
145	XX	Normal ending of the command, with extra information from the proactive			
SIM, containing a command for the ME.					
Length 'XX' of the response data.					
case of a SIM data					
158	XX	Length 'XX' of the response data given in download error.			
159	XX	Length 'XX' of the response data.			
Responses to commands which are postponed:					
<sw1>	<sw2>	Error Description			
147	0	SIM Application Toolkit is busy.			

Command cannot be internal update retry	146	0X	executed at present, further normal commands are allowed.
			Command successful but after using an routine 'X' times.
	146	64	Memory problem.
	148	0	No EF selected.
	148	2	Out of range (invalid address).
	148	4	• File ID not found.
command	148	8	• Pattern not found.
	152	2	File is inconsistent with the
	152	4	No CHV initialized • Access condition not fulfilled. • Unsuccessful CHV verification, at least one attempt left.
			• Unsuccessful
			UNBLOCK CHV verification, at least one attempt left.
			• Authentication failed.
status.	152	8	In contradiction with CHV status.
	152	16	In contradiction with invalidation
	152	64	• Unsuccessful CHV verification, no attempt left.
			• Unsuccessful
			UNBLOCK CHV verification, no attempt left.
			• CHV blocked. • UNBLOCK CHV blocked.
value reached.	152	80	Increase cannot be performed, Max
gives the correct	103	XX	Incorrect parameter P3 (NOTE: 'XX'
the command.	107	XX	length or states that no additional information is given
	109	XX	Incorrect parameter P1 or P2. Unknown instruction code given in
command.	110	XX	Wrong instruction class given in the
diagnostic given.	111	XX	Technical problem with no

<response>: response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer GSM 51.011). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command

Example:

1. read IMSI

```
AT+CRSM=176,28423,0,0,9          //READ BINARY,  file
ID(6F07),0,0,9 bytes
+CRSM: 144,0,084906005743219944 //generic success code, 9 bytes of file data
```

2. read last number dialled

```
AT+CRSM=192,28484           //GET RESPONSE, file ID(6F44)
+CRSM: 144,0,000001186F44044011FF440102031C // generic success code, 0000->
RFU
```

0118->File size 6F44-> File ID 04-> Type of the file (EF) 40->RFU
 11FF44->Access conditions (READ=1-CHV1, UPDATE=1- CHV1)
 01->File status 02->Length of the following data (byte 14 to the end)
 03->Structure of EF (cyclic) 1C->Length of a record (For cyclic and linear fixed EFs this byte denotes the length of a record. For a transparent EF, this byte shall be coded '00')

AT+CRSM=178,28484,0,4,28 //READ RECORD,
 EFLND file ID(6F44), 0, current,28 bytes of
 the record(according to above get response
 return value length of record 1C)
 +CRSM: 144,0,FFFFFFFFFFFFFFFFFF04810180F6FFFFFFFFFFFF//
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF//
 ->Alpha
 Identifier, 04->length of BCD number, 81->TON and NPI,
 0180F6FFFFFFFFFFFF->Dialling number(10086)

3.8.20 AT+CACM

Description

Set command resets the Advice of Charge related accumulated call meter value in SIM card or in the active application in the UICC (GSM or USIM) file EFACM.

Read command returns the current value of ACM.

Syntax

Command	Possible responses
+CACM=[<passwd>]	OK/+CME ERROR: <err>
+CACM?	+CACM: <acm> OK/+CME ERROR: <err> Example: +CACM: "000000" OK
+CACM=?	+CACM:(0 - FFFFFF) OK

Defined values

<passwd>: string type; SIM PIN2

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

3.8.21 AT+CAMM

Description

Set command sets the Advice of Charge related accumulated call meter maximum value in SIM card or in the active application in the UICC (GSM or USIM) file EFACMmax.
 Read command returns the current value of ACMmax.

Syntax

Command	Possible responses
+CAMM=[<acmmax>[,<passwd>]]	OK/+CME ERROR: <err>
+CAMM?	+CAMM: <acmmax> OK/+CME ERROR: <err> Example: +CAMM: "000000" OK
+CAMM=?	+CAMM:(000000 - FFFFFF) OK

Defined values

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

<passwd>: string type; SIM PIN2

3.8.22 AT+CPUC

Description

Set command sets the parameters of Advice of Charge related price per unit and currency table in SIM card or in the active application in the UICC (GSM or USIM) file EF_{PUCT}.

Read command returns the current parameters of PUCT.

Syntax

Command	Possible responses
+CPUC=<currency>,<ppu>[,<passwd>]	OK/+CME ERROR: <err>
+CPUC?	+CPUC: <currency>,<ppu> OK/+CME ERROR: <err>
+CPUC=?	+CPUC: <currency>, <ppu>, <PIN2> OK

Defined values

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

<ppu>: string type; price per unit; (e.g. "2.66","2.10E1", "2.10E-1")

<passwd>: string type; SIM PIN2

3.8.23 AT+CCWE

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.

Read command returns the current setting.

Test command returns supported settings.

Syntax

Command	Possible responses
+CCWE=<mode> Note: <mode> 0: Disable the call meter warning event 1: Enable the call meter warning event	OK/+CME ERROR: <err>
+CCWE?	+CCWE: <mode> OK/+CME ERROR: <err>
+CCWE=?	+CCWE: (list of supported <mode>s) +CME ERROR: <err>

3.8.24 AT*SIMDETEC

Description

The set command is used to detect the sim in specified slot was removed or not.
The test command returns supported sim slot.

Syntax

Command	Possible responses
AT*SIMDETEC=<simslot>	*SIMDETEC: <simslot>, <state> OK/+CME ERROR
AT*SIMDETEC=?	*SIMDETEC: (1,2) OK

Defined values

<simslot>:

1 - master sim.
2 - slave sim.

Note: the slave sim is not supported now.

<state>:

"NOS" - SIM was removed
"SIM" - SIM was inserted

Note: The example when use this AT command is as following:
AT*SIMDETEC=?

*SIMDETEC: (1,2)

OK

AT*SIMDETEC=1

*SIMDETEC: 1,NOS

//the master sim was removed

OK

3.8.25 Unsolicited result code: *SIMDETEC

Description

ASR extended AT command to indicate the SIM status

Syntax

*SIMDETEC: <simslot>, <state>

Defined Values

Refer to parameter description in AT*SIMDETEC item

3.8.26 AT+ERGA

Description

This command is used to implement “RUN GSM ALGORITHM” in SIM(refer 3GPP TS 51.011)

Syntax

Command	Possible responses
+ERGA=<rand>	+ERGA:<sres>,<kc> OK/+CME ERROR: <err>

Defined values

<rand>: 32 bytes length, string type values. (16 bytes defined in 3GPP TS 51.011)

<sres>: 8 bytes length, string type values. (4 bytes defined in 3GPP TS 51.011)

<kc>: Cipher Key Kc, 16 bytes length, string type values. (8 bytes defined in 3GPP TS 51.011)

NOTE: According to 3GPP 51.011, <rand> is 16bytes length; here 32 bytes are generated by expanding 16bytes with Hex format. <sres>, and <kc> are also expanded to double size with Hex format.

For example, <rand> defined in TS51.011[28] is 16 bytes like {0x11, 0x22, 0x33, 0x44, 0x55, 0x66, 0x77, 0x88, 0x88, 0x77, 0x66, 0x55, 0x44, 0x33, 0x22, 0x11}. <rand> used in +ERGA is expanded to 32 bytes string “11223344556677888877665544332211”.

AT CMD: AT+ERGA=”11223344556677888877665544332211”

RESPONSE: +ERGA: BD27B8A3, 5B3FCBEA771F4800

From the response, <sres> is “BD27B8A3”. Its string size is 8bytes. But <sres> should be parse into 4 bytes values {0xBD, 0x27, 0xB8, 0xA3}, and <kc> is 16 bytes string values, should be parse to 8 bytes values {0x5B, 0x3F, 0xCB, 0xEA, 0x77, 0x1F, 0x48, 0x00}.

3.8.27 AT+ERTCA

Description

This command is used to implement 3G Context authentication mechanism in USIM(refer to 3GPP TS 31.102).

Syntax

Command	Possible responses
+ERTCA=<rand>,<autn>,<sessionid>	+ERTCA:<status>,[<res/auts>[,<ck>,<ik>[,<kc>]]] OK/+CME ERROR: <err>

Defined values

<status>:

0: Success

1: Synchronisation failure

2: Authentication error, incorrect MAC (the status word SW1&SW2 : '9862')

3: Unsupported security context (the status word SW1&SW2: '9864')

<rand>: 32 bytes length, string type values. (16 bytes defined in 3GPP TS31.102)

<autn>: 32 bytes length, string type values. (16 bytes defined in 3GPP TS31.102)

<sessionid>: target a specific application on the smart card using logical channel mechanism.

<res>: string type values

<auts>: string type values

<ck>: string type values

<ik>: string type values

<kc>: string type values

NOTE: According to 3GPP TS31.102, <rand> and <autn> are 16bytes length, here 32 bytes are generated by expanding 16bytes with Hex format. <res>, <auts>, <ck>, <ik> and <kc> are also expanded to double size with Hex format.

For example, <rand> defined in TS31.102 is 16 bytes like {0x85, 0xba, 0x47, 0x63, 0x19, 0xa3, 0x91, 0xc3, 0xb3, 0xf0, 0xe1, 0x5b, 0xb2, 0x62, 0x16, 0x8a}. <autn> defined in TS31.102 is 16 bytes like {0x9f, 0x19, 0xe5, 0xc3, 0x1a, 0xce, 0x00, 0x00, 0xb5, 0xea, 0x9b, 0xfa, 0xa5, 0xaf, 0xfc, 0xe5}. <rand> used in +ERTCA is expanded to 32 bytes string "85ba476319a391c3b3f0e15bb262168a". And <autn> used in +ERTCA is expanded to 32 bytes string "9f19e5c31ace0000b5ea9bfaa5affce5".

AT CMD: AT+ERTCA="85ba476319a391c3b3f0e15bb262168a",

"9f19e5c31ace0000b5ea9bfaa5affce5"

RESPONSE: +ERTCA: 1, 1AED78F49C6E92281D3996B2065C

From the response, <auts> is "1AED78F49C6E92281D3996B2065C". Its string size is 28bytes. But <auts> should be parse into 14 bytes values {0x1A, 0xED, 0x78, 0xF4, 0x9C, 0x6E, 0x92, 0x28, 0x1D, 0x39, 0x96, 0xB2, 0x06, 0x5C }

3.8.28 AT+MSTK

Description

Services related to SIM Toolkit application [ASR private AT command]

Syntax

Command	Possible responses
+MSTK=<cmd>[,<data> Note: <cmd>: 0: enable/disable proactive command Indication 1: download ME capability profile 2. requests SIMAT notification capability info 3. get SIM card profile 4. send envelope command 11. respond to proactive command 12. respond to setup call request from STK app	+MSTK:<cmd>, <response data> OK There will be unsolicited result code +MSTK:<cmdType>[,<value>]sent from MT to TE. < cmdType >: 11: proactive indication 12: set up call indication 13: display Info indication 14: session end indication 15: set up call status indication 16: set up call result indication 18: send SM status indication 19: send SM result indication 20: send USSD result indication
+MSTK=?	+MSTK: (0-3),<data> OK

Example:

AT+MSTK=0,0 //disable proactive
command indication

OK

AT+MSTK=0,1 //enable proactive
command indication

OK

AT+MSTK=3 //get SIM(USIM) card profile, every bit represent each facility support or not by SIM

+MSTK:3, FFFFFFFF7F11009F3F0000000000000000 //SIM

(+MSTK:3, FFFFFFFF7F1100DFFF0000000000000000000000) //USIM

OK

AT+MSTK=2 //request SIMAT notification capability info

+MSTK: 2, 111212111333421211

OK

AT+MSTK=1, FFFFFFFF7F11009F3F0000000000000000(SIM)

AT+MSTK=1, FFFFFFFF7F1100DFBF000000000000000000000000 (USIM)

//download ME capability profile, every bit represent each facility support or not by SIM(USIM)

OK

+MSTK: 11,
D05E01030225000202818205F80005500530049004D53615E9475280F082880624B673A62A
50F0C5680624B673A84254E1A53850F06688070AB94C30F0A778065B095FB5A314E500F0
AA880638C4E0A80A15E020F0ABF807CBE5F694E0A6D77
//proactive SIM commands "SET UP MENU" indication

AT+MSTK=11,010302250082028281830100 // respond to proactive command "SET UP
MENU"

OK

AT+MSTK=4,d30782020181900128 // send envelope command "MENU
SELECTION"

OK

+MSTK: 11,
D02F0103042400020281820F10018065B095FB65E9665A62A55B9A52360F06028053D66D88
0F0A03804E1A52A14ECB7ECD
//proactive SIM commands "SELECT ITEM" indication

AT+MSTK=11,010304240082028281830111 // respond to proactive command "SELECT
ITEM"

OK

+MSTK: 14 // Session End indication

3.8.29 AT*ENVSIM

Description

Enable Virtual SIM

Syntax

Command	Possible responses
*ENVSIM	OK/+CME ERROR: <err>
*ENVSIM?	*ENVSIM: <n> OK/+CME ERROR: <err> Notes: <n> 0-disabled 1-enabled
*ENVSIM=?	OK

3.8.30 AT*EUICC

Description

Get the SIM card type.

Syntax

Command	Possible responses
*EUICC?	*EUICC: <n>(Note) OK <n>(Note1) 0: SIM 1: USIM 2: TEST SIM 3: TEST USIM 4: UNKNOWN Note: *EUICC: <n> can also be unsolicited result code sent from MT to TE when there is a change in the PIN status of the SIM/USIM card. Note1: the value (2,3,4) is protected by special MACRO, by default the MACRO is not defined and will not return these values.

3.8.31 Unsolicited result code: +REFRESH

Description

Indicates that file(s) on the SIM have been updated, or the SIM has been reinitialized.

Syntax

+REFRESH: <rc>, <EFID>

Defined Values

<rc>: result of a SIM refresh.

- 0 a file on SIM has been updated.
- 1 SIM initialized, all file should be re-read
- 2 SIM reset, SIM power required, SIM may be locked and all files should be re-read

<EFID>: EFID of the updated file if <rc> is 0

3.8.32 Generic UICC logical channel access +CGLA

Description

Set command transmits to the MT the <command> it then shall send as it is to the selected UICC. In the same manner the UICC <response> shall be sent back by the MT to the TA as it is.

This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.

Although Generic UICC Logical Channel Access command +CGLA allow TE to take control over the UICC-MT interface, there are some functions of the UICC-MT interface that logically do not need to be accessed from outside the TA/MT. Moreover, for security reason the GSM network authentication should not be handled outside the TA/MT. Therefore it shall not be allowed to execute a Run GSM Algorithm command or an Authenticate command in GSM context from the TE using +CGLA at all time whether the +CGLA is locked or unlocked. This shall not forbid the TE to send Authenticate commands in other security contexts (e.g. EAP security context).

Syntax

Command	Possible responses
+CGLA=<sessionid>,<length>,<command>	+CGLA: <length>,<response> OK/+CME ERROR: <err>
+CGLA=?	+CGLA: <sessionid>,<length>,<cmd> OK

Defined values

<sessionid> : integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").

<length> : integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response)

<command> : command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format; refer +CSCS)

<response> : response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101(hexadecimal character format; refer +CSCS).

3.8.33 Restricted UICC logical channel access +CRLA

Description

By using this command instead of Generic UICC Access +CGLA TE application has easier but more limited access to the UICC database. Set command transmits to the MT the UICC <command> and its required parameters. MT handles internally, for the selected UICC, all UICC-MT interface locking and file selection routines. As response to the command, MT sends the actual UICC information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the UICC, but failure in the execution of the command in the UICC is reported in <sw1> and <sw2> parameters.

Coordination of command requests to UICC and the ones issued by GSM/UMTS application inside the MT is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

Syntax

Command	Possible responses
---------	--------------------

+CRLA=<sessionid>,<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	+CRLA: <sw1>,<sw2>[,<response>] OK/+CME ERROR: <err>
+CRLA=?	+CRLA:<sessionid>,<cmd>[,<fieldid>[,<p1>,<p2>,<p3>[,<data>]]]] OK

Defined values

<sessionid>: integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").

<command> (command passed on by the MT to the UICC; refer 3GPP TS 31.101):

- 176 READ BINARY
- 178 READ RECORD
- 192 GET RESPONSE
- 214 UPDATE BINARY
- 220 UPDATE RECORD
- 242 STATUS
- 203 RETRIEVE DATA
- 219 SET DATA

all other values are reserved

Note1: The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.<fileid>: integer type; this is the identifier of a elementary datafile on UICC. Mandatory for every command except STATUS.

Note2: The range of valid file identifiers depends on the actual UICC and is defined in 3GPP TS 31.101. Optional files may not be present at all. <P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the UICC. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP TS 31.101.

<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 UICC in hexadecimal format (e.g. "5F704F30" for DFSoLSA/EFSAI). The <pathid> shall only be used in the mode "select by path from current DF" as defined in ETSI TS 102 221.

<sw1>, <sw2>: integer type; information from the UICC about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

<response>: response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes

the type of file and its size (refer 3GPP TS 31.101). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command.

3.8.34 Open logical channel +CCHO

Description

Execution of the command causes the MT to return <sessionid> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical channel; select the application identified by the <dfname> received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel.

This <sessionid> is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or Generic UICC Logical Channel access +CGLA commands.

Note: The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 for further information on logical channels in APDU commands protocol.

Syntax

Command	Possible responses
+CCHO=<dfname>	+CCHO: <sessionid> OK/+CME ERROR: <err>
+CCHO=?	+CCHO: <dfname> OK

Defined values

<dfname>: all selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes

<sessionid>: integer type; a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.

3.8.35 Close logical channel +CCHC

Description

This command asks the ME to close a communication session with the active UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command.

Syntax

Command	Possible responses
+CCHC=<sessionid>	+CCHC OK/+CME ERROR: <err>

+CCHC=?	+CCHC: <sessionid> OK
---------	--------------------------

Defined values

<sessionid>: integer type; a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.

3.8.36 Unsolicited result code: *AMRCODEC

Description

Indicate AMR codec type.

Syntax

*AMRCODEC:<codecType>

Defined Values

<codecType>:

0 WB AMR

1 NB AMR

2 others

3.8.37 Set power back off *GRIP

Description

This command asks the MT to power back off when people nearby to reduce radiation for people.

Syntax

Command	Possible responses
*GRIP=<option> <option> 0 power resume 1 power back off	OK/+CME ERROR: <err>
*GRIP =?	*GRIP:(0,1) OK

3.8.38 Configure MT info *COMCFG

Description

This command used to configure MT info.

Syntax

Command	Possible responses
AT*COMCFG:<mode>,<tokens> or <UMTS_WB_AMR value>,<GSM_WB_AMR value>,<VENDOR value>,<MANUFACTURE value>,<LTECATEGORY value> <mode>: 0 get MT configuration	When <mode> is 0 *COMCFG: <UMTS_WB_AMR value>,<GSM_WB_AMR value>,<VENDOR value>,<MANUFACTURE value>,<LTECATEGORY value>

<p>1 set MT configuration If <mode> is 0 AT*COMCFG:<mode>,<tokens> <tokens>: A bitmap representing the MT info to get. If<mode> is 1 AT*COMCFG:<mode>, <UMTS_WB_AMR value>,<GSM_WB_AMR value>,<VENDOR value>,<MANUFACTURE value>,<LTECATEGORY value> <UMTS_WB_AMR value>: 0 or 1 indicate WB AMR is used in UMTS <GSM_WB_AMR value>: 0 or 1 indicate WB AMR is used in GSM <VENDOR value>: vendor info 0 NONE 1 ATT 2 CMCC, 4 IOT 8 TELCEL 16 H3G 32 VDF 64 SILVER 128 ORG 256 TMOBILE 512 VERIZON 1024 HP <MANUFACTURE value>:manufacture info 0 NONE 1 M_SILVER <LTCATEGORY value>:manufacture info 4 NB1 5 NB2</p>	<p>OK/+CME ERROR: <err> When <mode> is 1 OK/+CME ERROR: <err> Example: AT*COMCFG=0,3 *COMCFG=1,1 OK AT*COMCFG=1,0,0,4 OK AT*COMCFG=0,7 *COMCFG=0,0,4 OK</p>
AT*COMCFG=?	*COMCFG:<mode>,<tokens> or <UMTS_WB_AMR value>,<GSM_WB_AMR value>,<VENDOR value>,<MANUFACTURE value>,<LTCATEGORY value> OK

3.8.39 AT+VZWRSP

Description

Read command returns the RSRP values for all cells which the UE is measuring. The device shall be capable of returning the RSRP values of up to 8 cells. This device shall support this command in both RRC IDLE and RRC CONNECTED modes.

Syntax

Command	Possible responses
+VZWRSP?	+VZWRSP:<cellID>1,<EARFCN>1,<RSRP>1,<cellID>2,<EARFCN>2,<RSRP>2,...,<cellID>n,<EARFCN>n,<RSRP>n OK/+CME ERROR: <err>

Defined values

<cellID>: Integer type; Cell ID where the format is "XXX"

<EARFCN>: Integer type; EARFCN for given cell where EARFCN is per 3GPP TS 36.101
<RSRP>: String type; RSRP value where the format is "-XXX.XX" dBm/15kHz

3.8.40 AT+VZWRSRQ

Description

Read command returns the RSRQ values for all cells which the UE is measuring. The device shall be capable of returning the RSRQ values of up to 8 cells. This device shall support this command in both RRC IDLE and RRC CONNECTED modes.

Syntax

Command	Possible responses
+VZWRSRQ?	+VZWRSRQ:<cellID>1,<EARFCN>1,<RSRQ>1, <cellID>2,<EARFCN>2,<RSRQ>2,..., <cellID>n,<EARFCN>n,<RSRQ>n OK/+CME ERROR: <err>

Defined values

<cellID>: Integer type; Cell ID where the format is "XXX"

<EARFCN>: Integer type; EARFCN for given cell where EARFCN is per 3GPP TS 36.101

<RSRQ>: String type; RSRQ value where the format is "-XXX.XX" dB/15kHz

3.8.41 AT*GATR

Description

This command is used to get some UICC information.

Syntax

Command	Possible responses
*GATR	*GATR:<data_len>, [data] OK/+CME ERROR: <err>

3.8.42 AT+CEN

Description

This command allows for reading and dynamical reporting of emergency numbers as received from the network. The emergency numbers are not necessarily received for the same <mcc> and <mnc> as currently registered to.

Read command returns one line of intermediate result code +CEN1: <reporting>,<mcc> with the current <reporting> setting and the Mobile Country Code <mcc>. Then follows zero or more occurrences of the emergency numbers with intermediate result code +CEN2: <cat>,<number>.

Set command enables reporting of new emergency numbers received from the network with unsolicited result codes equal to the intermediate result codes of the read form of the command.

Test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CEN=[<reporting>]	
+CEN?	+CEN1: <reporting>[,<mcc>,<mnc>] <CR><LF>[+CEN2: <cat>,<number> [<CR><LF>+CEN2: <cat>,<number> [...]]] <mcc>: string type <mnc>: string type
+CEN=?	+CEN: (list of supported <reporting>s)

3.8.43 AT+CISRVCC

Description

Set command informs MT about the SRVCC Support. MT normally updates the network when changing this parameter.

Read command returns the status of the MT stored SRVCC Support.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
+CISRVCC=[<uesrvcc>]	+CME ERROR: <err>
+CISRVCC?	+CISRVCC: <uesrvcc>
+CISRVCC=?	+CISRVCC: (list of supported <uesrvcc>s)

3.8.44 AT+CAVIMS

Description

Set command informs the MT whether the UE is currently available for voice calls with the IMS (see 3GPP TS 24.229). The information can be used by the MT to determine "IMS voice not available" as defined in 3GPP TS 24.301, and for mobility management for IMS voice termination, see 3GPP TS 24.008.

Read command returns the UEs IMS voice call availability status stored in the MT.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
+CAVIMS=[<state>]	
+CAVIMS?	+CAVIMS: <state>
+CAVIMS=?	+CAVIMS: (list of supported <state>s)

3.8.45 AT+CASIMS

Description

Set command informs the MT whether the UE is currently available for SMS using IMS (see 3GPP TS 24.229). The information can be used by the MT to determine the need to remain attached for non-EPS services, as defined in 3GPP TS 24.301.

Read command returns the UE's SMS using IMS availability status, as stored in the MT. Test command returns supported values as a compound value.

Syntax

Command	Possible responses
+CASIMS=<state>	
+CASIMS?	+CASIMS: <state>
+CASIMS=?	+CASIMS: (list of supported <state>s)

3.8.46 AT+CIREP

Description

Set command enables or disables reporting of PS to CS SRVCC, PS to CS vSRVCC and CS to PS SRVCC handover information, and of IMS Voice Over PS sessions (IMSVOPS) indicator information, by CIREPI and CIREPH.

Read command returns the status of result code presentation and the IMSVOPS supported indication.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
+CIREP=[<reporting>]	
+CIREP?	+CIREP: <reporting>, <nwimsvops>
+CIREP=?	+CIREP: (list of supported <reporting>s)

3.8.47 AT*ISIMAID

Description

Execution command queries ISIM AID. If ISIM exists, this command will return the ISIM application ID, otherwise return empty string

Syntax

Command	Possible responses
*ISIMAID	*ISIMAID: <aid string> OK

3.8.48 Unsolicited result code: *ISIMAI

Description

Indication to report ISIM AID

Syntax

*ISIMAI: < aid string >

3.8.49 AT+MEDCR

Description

Set/Get MEDATA COMM SERVER

Syntax

Command	Possible responses
+MEDCR=<flag>,<position>[,<configVal>]	+MEDCR: <position>,<value> OK

< flag >: a numeric parameter which determinates the operation

0: set operation

1: get operation

<position>: a numeric parameter, range (0-255)

8: opt for specific IOT without 4G to fasten registration

9: opt for no detach/attach for AT*BAND initated 23G NW mode change

10: opt for limit EF update for StartCS/PS

11: opt for remapping PS cid(default 5) since NW rejects 2nd same APN

12: opt for using invalid KSI(7) in case not power off normally

13: opt for setting LTE initial APN cid map from ebi/nsapi

30: opt for control cell change auto-reporting

46: LTE

47: UMTS

48: GSM

< configVal >: a numeric parameter, the configure value of each opt, range (0-255)

3.8.50 AT*ECCLIST

Description

This command is used to get emergency number list

Syntax

Command	Possible responses
AT*ECCLIST	*ECCLIST: <count>, <emergency number str> OK

Defined values

< count >: a numeric parameter , indicates the total number of items in <emergency number>

<emergency number str>: a string parameter, indicates the emergency number list. An emergency number item including service category and call number.

Example:

*ECCLIST: 6, "0, 112, 0, 000, 0, 08, 0, 118, 0, 911, 0, 999"

[6]: total 6 emergency number items: (0,112), (0, 000), (0, 08), (0,118), (0,911), (0,999)

[0, 112]: an emergency number item, 0 means service category type, 112 means emergency number

3.8.51 Unsolicited result code: *ECCLIST

Description

Indication to report emergency number list

Syntax

*ECCLIST: <count>, <emergency number str>

3.8.52 AT*SIMPOLL

Description

Set command controls parameters for polling interval of (U)SIM, and the new parameters will be saved in NVM.

Syntax

Command	Possible responses
AT*SIMPOLL=[<mode>[,<pollingConfig>,<stkPolling>,<Interval>]] Note: <mode>: integer type 0 - disable Polling 1 - enable Polling (Default) < pollingConfig >: integer type 0 - use UE default interval, 28s. (Default) 1 - enable polling config interval. < stkPolling > integer type 0 - don't use stk polling interval although STK provide the interval 1 - use the stk polling interval. (Default) < Interval >: integer type 1~65535 unit: second	OK/+CME ERROR: <err>
AT* SIMPOLL?	*SIMPOLL=[<mode>[<pollingConfig>,<stkPolling>,<Interval>]] OK Example: *SIMPOLL : 1, 1, 0,30 OK

AT* SIMPOLL =?	* SIMPOLL: (list of supported <mode>s), < pollingConfig >, < stkPolling >, < Interval > OK/+CME ERROR: <err>
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3.8.53 AT*ICCID

Description

This command is used to get ICCID.

Syntax

Command	Possible responses
* ICCID?	*ICCID: <iccid>

3.8.54 AT+SWITCHSIM

Description

Set command to set mater SIM. Only applied for dual-sim project.

Syntax

Command	Possible responses
AT+SWITCHSIM=<simID> Note: < simID >: integer type 0 - SIM1 1 - SIM2	OK/+CME ERROR: <err>
AT+ SWITCHSIM?	+SWITCHSIM: <simID> OK
AT+ SWITCHSIM =?	+SWITCHSIM: (0: SIM1, 1: SIM2) OK/+CME ERROR: <err>

3.9 Packet domain Commands

3.9.1 AT+CGREG

Description

The set command controls the presentation of an unsolicited result for package network registration status: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>,<AcT>,<rac>] when <n>=2 and there is a change of the network cell, or code +CGREG: <stat>[,[<lac>],[<ci>], [<AcT>],[<rac>][,<cause_type>,<reject_cause>]] when <n>=3 and there is a change of the network cell.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT.

Syntax

Command	Possible responses
+CGREG=<n> Note: <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 cause value information unsolicited result code +CGREG: <stat>[,<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]]	OK/+CME ERROR: <err>
+CGREG? 	+CGREG: <n> <stat>[,<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]] OK/+CME ERROR: <err> Note: <stat>,<lac>,<ci>,<AcT>,<cause_type>, <reject_cause> refer to 3.7.1 Example: +CGREG: 2,1,"43018","01b29362",2,0 OK
+CGREG=?	+CGREG: (0,3) OK

3.9.2 AT+CIREG

Description

The set command controls the presentation of an unsolicited result code +CIREGU: <reg_info>[,<ext_info>] when there is a change in the MT's IMS registration information.

The read command returns <n>, that shows whether reporting is enabled or disabled, <reg_info> that shows whether one or more of the public user identities are registered and optionally <ext_info>, that shows the status of the MT's IMS capabilities. For <ext_info>, all relevant values are always summarized and reported as a complete set of IMS capabilites in the unsolicited result code.

Syntax

Command	Possible responses
+CIREG=[<n>] Note: <n>: Enables or disables reporting of changes in the MT's IMS registration information. 0: disable reporting. 1: enable reporting (parameter <reg_info>). +CIREG: <reg_info> 2: enable extended reporting (parameters	OK/+CME ERROR: <err>

<p><reg_info> and <ext_info>).</p> <p>+CIREG: < reg_info >,<ext_info></p> <p><reg_info>: Indicates the IMS registration status. 0: not registered. 1: registered.</p> <p><ext_info>: The value range is from 1 to FFFFFFFF. It is a sum of hexadecimal values, each representing a particular IMS capability of the MT. 1: RTP-based transfer of voice according to MMTEL, see 3GPP TS 24.173 [87]. This functionality can not be indicated if the UE is not available for voice over PS, see 3GPP TS 24.229 [89]. 2: RTP-based transfer of text according to MMTEL, see 3GPP TS 24.173 [87]. 4: SMS using IMS functionality, see 3GPP TS 24.341 [101]. 8: RTP-based transfer of video according to MMTEL, see 3GPP TS 24.173 [87]. The hexadecimal values 10, 20, 40 ... 80000 are reserved by the present document.</p>	
<p>+CIREG?</p>	+CIREG: <n>,<reg_info>[,<ext_info>]

3.9.3 AT+CGATT

Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service.

The read command returns the current Packet Domain service state.

The test command is used for requesting information on the supported Packet Domain service states.

Syntax

Command	Possible responses
+CGATT= <state> Note: <state>: indicates the state of PS attachment 0 - detached 1 - attached	OK/+CME ERROR: <err>
+CGATT?	+CGATT: <state> OK Example

	+CGATT: 1 OK
+CGATT=?	+CGATT: (0-1) OK

3.9.4 AT+CGACT

Description

The execution command is used to activate or deactivate the specified PDP context (s). The read command returns the current activation states for all the defined PDP contexts. The test command is used for requesting information on the supported PDP context activation states.

Syntax

Command	Possible responses
+CGACT=<state> [,<cid>] Note: <state>: indicates the state of PDP context activation 0 - deactivated 1 - activated	OK/+CME ERROR: <err>
+CGACT?	[+CGACT: <cid>, <state>[<CR><LF>]+CGACT: <cid>, <state>[...]] OK/+CME ERROR: <err>
+CGACT=?	+CGACT: (0,1) OK

3.9.5 AT+CGDATA

Description

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

The test command is used for requesting information on the supported layer 2 protocols.

Syntax

Command	Possible responses
+CGDATA=<L2P>,<cid> Note: <L2P>: a string parameter that indicates the layer 2 protocol to be used between the TE and MT PPP: Point-to-point protocol for a PDP such as IP <cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). Example: AT+CGDATA="PPP",1 AT+CGDATA="",1	CONNECT/ERROR

+CGDATA=?	+CGDATA: (""), (1-8) OK
-----------	----------------------------

3.9.6 AT+CGDCONT

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGDCONT=<cid> [<PDP_type> [<APN> [<PDP_addr> [<d_comp> [<h_comp> [<ipAddrAlloc> [<request_type> [<pCscfDiscovery> [<imCnSignallingFlagInd>]]]]]]]]]	OK/+CME ERROR: <err>
+CGDCONT?	[+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>, <ipAddrAlloc>, <request_type>, <pCscfDiscovery>, <imCnSignallingFlagInd> [<CR><LF>]+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>, <ipAddrAlloc>, <request_type>, <pCscfDiscovery>, <imCnSignallingFlagInd> [...]] OK+CME ERROR: <err>
+CGDCONT=?	+CGDCONT: (1-15),!"IP"\,,,(0-1),(0-1)OK

Defined values

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

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

IP Internet Protocol (IETF STD 5)

IPV6 Internet Protocol, version 6 (IETF RFC 2460)

IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301 [83])

PPP Point to Point Protocol (IETF STD 51)

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

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

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

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

The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>: a numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 44.065)
0 - off (default if value is omitted)
1 - on (manufacturer preferred compression)
2 - V.42bis
Other values are reserved.

Note: only support 0 and 2 now.

<h_comp>: a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 and 3GPP TS 25.323)
0 - off (default if value is omitted)
1 - RFC1144 (applicable for SNDCP only)
2 - RFC2507

Note: only support 0 and 1 now.

<IPv4AddrAlloc>: integer type; controls how the MT/TA requests to get the IPv4 address information
0 IPv4 address allocation through NAS signalling
1 IPv4 address allocated through DHCP

<request_type>: integer type; indicates the type of PDP context activation request for the PDP context

NOTE: If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9.

0 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 handover is implementation specific)

- 1 PDP context is for emergency bearer services
- 2 PDP context is for new PDP context establishment
- 3 PDP context is for handover from a non-3GPP access network
- 4 PDP context is for handover of emergency bearer services from a non-3GPP access network
- 10 PDP context is for MMS

NOTE: A PDP context established for handover of emergency bearer services from a non-3GPP access network has the same status as a PDP context for emergency bearer services.

<pCscfDiscovery >: integer type; 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

< imCnSignallingFlagInd >: integer type; indicates 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 signalling only

3.9.7 AT+CGDSCONT

Description

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>.

The read command returns the current settings for each defined context.

Syntax

Command	Possible responses
+CGDSCONT=<cid> [<p_cid> [<d_comp> [<h_comp> [<imCnSignallingFlagInd>]]]]]	OK/+CME ERROR: <err>
+CGDSCONT?	[+CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp>, <imCnSignallingFlagInd> [<CR><LF>+CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp>, <imCnSignallingFlagInd> [...]]] OK/+CME ERROR: <err>
+CGDSCONT=?	+CGDSCONT: (range of supported <cid>s), (list of <cid>s for active primary contexts), (list of supported <d_comp>s), (list of supported <h_comp>s), (list of supported <imCnSignallingFlagInd>s) OK

Defined values

<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.

<d_comp>: a numeric parameter that controls PDP data compression (applicable for SNDCPonly) (refer 3GPP TS 44.065)
 0 - off (default if value is omitted)
 1 - on (manufacturer preferred compression)
 2 - V.42bis
 Other values are reserved.

Note: only support 0 and 2 now.

<h_comp>: a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 and 3GPP TS 25.323)
 0 - off (default if value is omitted)

1 - RFC1144 (applicable for SNDCP only)

2 - RFC2507

Other values are reserved.

Note: only support 0 and 1 now.

<IM_CN_Signalling_Flag_Ind>: integer type; indicates 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 signalling only

3.9.8 AT+CGQMIN

Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGQMIN=<cid> [<precedence> [<delay> [<reliability> [<peak> [<mean>]]]]]	OK/+CME ERROR: <err>
+CGQMIN?	+CGQMIN: +CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> [<CR><LF>]+CGQMIN: <cid>, <precedence>, <delay>, <reliability>, <peak>, <mean> [...] OK Example: CGQMIN: 1,3,4,5,1,1 CGQMIN: 2,3,4,5,1,1 CGQMIN: 3,3,4,5,1,1 CGQMIN: 4,3,4,5,1,1 CGQMIN: 5,3,4,5,1,1 CGQMIN: 6,3,4,5,1,1 CGQMIN: 7,3,4,5,1,1 CGQMIN: 8,3,4,5,1,1 OK
+CGQMIN=?	+CGQMIN: "IP", (0-4), (0-3), (0-5), (0-9), (0-18,31) OK

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

The following parameters are defined in -3GPP TS 23.107:

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

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

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

<peak>: a numeric parameter which specifies the peak throughput class

<mean>: a numeric parameter which specifies the mean throughput class

3.9.9 AT+CGQREQ

Description

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

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGQREQ=<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]	OK/+CME ERROR: <err>
+CGQREQ?	[+CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> [...]]] OK Example: CGQREQ: 1,0,0,0,0,0 CGQREQ: 2,0,0,0,0,0 CGQREQ: 3,0,0,0,0,0 CGQREQ: 4,0,0,0,0,0 CGQREQ: 5,0,0,0,0,0 CGQREQ: 6,0,0,0,0,0 CGQREQ: 7,0,0,0,0,0 CGQREQ: 8,0,0,0,0,0 OK
+CGQREQ=?	+CGQREQ: "IP",(0-4),(0-3),(0-5),(0-9),(0-18,31) OK

3.9.10 AT+CGEQREQ

Description

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

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGEQREQ=<cid> [,<Traffic class>]	OK/+CME ERROR: <err>

[,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio> [,<Residual bit error ratio> [,<Delivery of erroneous SDUs> [,<Transfer delay> [,<Traffic handling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]]]]	
+CGEQREQ?	<p>+CGEQREQ: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>, <Source statistics descriptor>, <Signalling indication>] [<CR><LF>+CGEQREQ: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>, <Source Statistics Descriptor>, <Signalling Indication> [...]]] OK Example: +CGEQREQ:1,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:2,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:3,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:4,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:5,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:6,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:7,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 +CGEQREQ:8,4,0,0,0,0,2,0,"0E0","0E0",3,0,1,0,0 OK</p>
+CGEQREQ=?	<p>For TD: +CGEQREQ: "IP", (0-4), (0-8640), (0-8640), (0-8640), (0-2), (0-1520), ("0E0"-1E1"), ("0E0"-6E8"), (0-3), (0-62), (0-3), (0-1), (0-1) OK For WCDMA: +CGEQREQ: "IP", (0-4), (0-256000), (0-256000), (0-256000), (0-256000), (0-2), (0-1520), ("0E0"-1E1"), ("0E0"-6E8"), (0-3), (0-62), (0-3), (0-1), (0-1)</p>

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107

<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

If the Traffic class is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided. Other values are reserved.

<Maximum bitrate UL>: a numeric parameter that indicates the maximum number of kbytes/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, ...). This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 subclause 10.5.6.5).

<Maximum bitrate DL>: a numeric parameter that indicates the maximum number of kbytes/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. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 subclause 10.5.6.5).

<Guaranteed bitrate UL>: a numeric parameter that indicates the guaranteed number of kbytes/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. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 subclause 10.5.6.5).

<Guaranteed bitrate DL>: a numeric parameter that indicates the guaranteed number of kbytes/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. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer TS 24.008 subclause 10.5.6.5).

<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 (refer TS 24.008 subclause 10.5.6.5).

<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 (refer TS 24.008 subclause 10.5.6.5).

<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 (refer TS 24.008 subclause 10.5.6.5).

<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
- 3 - 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 (refer TS 24.008 subclause 10.5.6.5).

<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 (refer TS 24.008 subclause 10.5.6.5).

<Source Statistics Descriptor>: a numeric parameter that specifies characteristics of the source of the submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as conversational or streaming (refer 3GPP TS 24.008 subclause 10.5.6.5).

- 0 Characteristics of SDUs is unknown
- 1 Characteristics of SDUs corresponds to a speech source

Other values are reserved.

<Signalling Indication>: a numeric parameter used to indicate signalling content of submitted SDUs for a PDP context. This parameter should be provided if the Traffic class is specified as interactive (refer 3GPP TS 24.008 subclause 10.5.6.5).

- 0 PDP context is not optimized for signalling
- 1 PDP context is optimized for signalling<PDP_type> (see +CGDCONT and +CGDSCONT commands).

3.9.11 AT+CGEQMIN

Description

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGEQMIN=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]]]	OK/+CME ERROR: <err>
+CGEQMIN?	+CGEQMIN: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>, <Source statistics descriptor>, <Signalling indication> [<CR><LF>]+CGEQMIN: [<cid>, <Traffic class>, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL>, <Guaranteed bitrate DL>, <Delivery order>, <Maximum SDU size>, <SDU error ratio>, <Residual bit error ratio>, <Delivery of erroneous SDUs>, <Transfer delay>, <Traffic handling priority>, <Source statistics descriptor>, <Signalling indication> [...]]]] OK Example: +CGEQMIN:1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

	+CGEQMIN:2,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:3,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:4,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:5,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:6,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:7,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 +CGEQMIN:8,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0 OK
+CGEQMIN=?	For TD: +CGEQREQ: "IP", (0-4), (0-8640), (0-8640), (0-8640), (0-2), (0-1520), ("0E0"- "1E1"), ("0E0"- "6E8"), (0-3), (0-62), (0-3), (0-1), (0-1) OK For WCDMA: +CGEQREQ: "IP", (0-4), (0-256000), (0-256000), (0-256000), (0-256000), (0-2), (0-1520), ("0E0"- "1E1"), ("0E0"- "6E8"), (0-3), (0-62), (0-3), (0-1), (0-1)

3.9.12 AT+GETIP

Description

Search IP via cid from local IP list

Syntax

Command	Possible responses
AT+GETIP=<cid> Note: <cid>: PDP context id. range 1-8 <ip>: IP address <gateway>: gateway address	+GETIP: <ip>,<gateway> OK/+CME ERROR: <err>

3.9.13 AT*TGSINK

Description

Private AT command: used to send the data through the specified PS data channel identified by cid.

Syntax

Command	Possible responses
AT*TGSINK=<cid>[,<PacketSize>[,<PacketCount>]] Note: cid: 1-11 PacketSize: 0-10000 PacketCount: 1-20	OK/+CME ERROR: <err>
AT*TGSINK=?	*TGSINK: (1-8),(0-10000),(1-20) OK

3.9.14 AT+CGSEND

Description

Private AT command: used to send the data through current activated PS data channel.

Syntax

Command	Possible responses
AT+CGSEND=<datalen>	OK/+CME ERROR: <err>
AT+CGSEND?	+CGSEND: (0-20000) OK
AT+CGSEND=?	+CGSEND: (0-20000) OK

3.9.15 AT+VPDUS

Description

Get Max PDU Size of data plane or control plane

Syntax

Command	Possible responses
+VPDUS=<option> <option>: 0 Request for the maximum PDU size when using the control plane 1 Request for the maximum PDU size when using the optimized data plane	+VPDUS:<PDU size> OK Example: AT+VPDUS=1 +VPDUS:2000 OK AT+VPDUS=0 +VPDUS:800 OK

3.9.16 AT+CGCMOD

Description

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

The test command returns a list of <cid>s associated with active contexts.

Syntax

Command	Possible responses
+CGCMOD=[<cid>]	OK/+CME ERROR: <err>
+CGCMOD=?	+CGCMOD: (list of <cid>s associated with active contexts) OK

3.9.17 AT+CGTFT

Description

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN for routing of down-link packets onto different QoS flows towards the TE.

The set command specifies a Packet Filters that is to be added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, <cid>.

The read command returns the current settings for all Packet Filters for each defined context.

The test command returns values supported as a compound value.

Syntax

Command	Possible responses
+CGTFT=<cid>, [<packet filter identifier>, <evaluation precedence index> [, <source address and subnet mask> [, <protocol number (ipv4) / next header (ipv6)> [, <local port range> [, <remote port range> [, <ipsec security parameter index (spi)> [, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [, <flow label (ipv6)> [, <direction>]]]]]]]]]	OK/+CME ERROR: <err>
+CGTFT?	[+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <remote address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <local port range>, <remote port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction>] [<CR><LF>]+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <remote address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <local port range>, <remote port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction> [...]] OK
+CGTFT=?	+CGTFT: <cid>(1-16), <packet filter identifier>(1-16), <evaluation precedence index>(0-255), <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <local port range>, <remote port range>, <ipsec security parameter index (spi)>(00000000-FFFFFFFF), <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>(00000-FFFFF), <direction>(0-3) OK

3.9.18 AT+FCLASS

Description

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

Syntax

Command	Possible responses
+FCLASS=<n> Note: <n> 0: data 1: fax class 1 (TIA 578 A)	OK/+CME ERROR: <err>
+FCLASS?	+FCLASS: <n> OK Example: +FCLASS: 0 OK
+FCLASS=?	+FCLASS: 0,1 OK

3.9.19 AT+CGEQOS

Description

The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] for a PDP context or Traffic Flows. When in UMTS/GPRS the MT applies a mapping function to UMTS/GPRS Quality of Service. A special form of the set command, +CGEQOS= <cid> causes the values for context number <cid> to become undefined.

The read command returns the current settings for each defined QoS.

The test command returns the ranges of the supported parameters.

Syntax

Command	Possible responses
+CGEQOS=<cid> [,<QCI> [,<DL_GBR>, <UL_GBR> [,<DL_MBR>,<UL_MBR]]]]	OK/+CME ERROR: <err>
+CGEQOS?	+CGEQOS: <cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR> [<CR>>LF>]+CGEQOS: <cid>,<QCI>,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR> [...]] OK/+CME ERROR: <err>
+CGEQOS=?	+CGEQOS: (range of supported <cid>s),(range of supported <QCI>s),(range of supported <DL_GBR>s),(range of supported <UL_GBR>s),(range of supported <DL_MBR>s),(range of supported <UL_MBR>s) OK

Defined values

<cid>: a numeric parameter which specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS.

<QCI>: a numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [85])

- 0 QCI is selected by network
- [1 – 4] value range for guaranteed bit rate Traffic Flows
- [5 – 9] value range for non-guaranteed bit rate Traffic Flows

<DL_GBR>: a numeric parameter which indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<UL_GBR>: a numeric parameter which indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<DL_MBR>: a numeric parameter which indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<UL_MBR>: a numeric parameter which indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

3.9.20 AT+CEREG

Description

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

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

Note: If the EPS MT also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

Syntax

Command	Possible responses
+CEREG=<n> <n>: 0: disable network registration unsolicited result code 1: enable network registration unsolicited result code +CEREG: <stat> 2: enable network registration and location information unsolicited result code +CEREG: <stat>[,<lac>,<ci>,<AcT>] 3: enable network registration, location information and cause value information unsolicited result code +CEREG: <stat>[,<lac>,<ci>,<AcT>][,<cause_type>,<reject_ca use>] <stat>: EPS registration status 0: not registered, MT is not currently searching an operator to register to 1: registered, home network	OK/+CME ERROR: <err>

<p>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 (attached for emergency bear only)(not applicable) 9: registered for "CSFB not preferred", home network (not applicable) 10: registered for "CSFB not preferred", roaming (not applicable) 11: attached for emergency bearer services only <lac>: string type; two byte location area code or tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) <ci>: string type; four byte GERAN/UTRAN/E-UTRAN cell ID in hexadecimal format <AcT>: access technology of the registered network 0: GSM 1: GSM Compact 2: UTRAN 3: GSM w/EGPRS (see NOTE 2) 4: UTRAN w/HSDPA (see NOTE 3) 5: UTRAN w/HSUPA (see NOTE 3) 6: UTRAN w/HSDPA and HSUPA (see NOTE 3) 7: E-UTRAN 8: UTRAN w/HSPA+ 9: E-UTRAN CA</p>	
+CEREG?	<p>+CEREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>] [,<cause_type>,<reject_cause>]] OK/+CME ERROR: <err></p>
+CEREG=?	<p>+CEREG: (range of supported <n>s) OK</p>

3.9.21 AT+CGCONTRDP

Description

The execution command returns the relevant information <bearer_id>, <apn>, <local_addr_and_subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr><IM_CN_Signalling_Flag> and <LIPA_indication> for a non secondary PDP Context established by the network with the primary context identifier <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the relevant information for all established PDP contexts are returned.

The test command returns a list of <cid>s associated with active contexts.

Note: The dynamic part of the PDP context will only exist if established by the network.

Syntax

Command	Possible responses
+CGCONTRDP=[<cid>]	+CGCONTRDP: <cid>, <bearer_id>, <apn>[, <local_addr and subnet_mask>[, <gw_addr>[, <DNS_prim_addr>[, <DNS_sec_addr>[, <P-CSCF_prim_addr>[, <P-CSCF_sec_addr>[, <IM_CN_Signalling_Flag>[, <LIPA_indication>]]]]]]] [<CR><LF>+CGCONTRDP: <cid>, <bearer_id>, <apn>[, <ip_addr>, <subnet_mask>[, <gw_addr>[, <DNS_prim_addr>[, <DNS_sec_addr>[, <P-CSCF_prim_addr>[, <P-CSCF_sec_addr>[, <IM_CN_Signalling_Flag>[, <LIPA_indication>]]]]]]] [...]] OK/+CME ERROR: <err>
+CGCONTRDP=?	+CGCONTRDP: (list of <cid>s associated with active contexts) OK

Defined values:

<cid>: a numeric parameter which specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands.

<bearer_id>: a numeric parameter which identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.

<APN>: a string parameter which is a logical name that was used to select the GGSN or the external packet data network.

<local_addr and subnet_mask>: string type; shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255) parameters on the form:

"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or
"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.

<gw_addr>: a string parameter which shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters

If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Gateway address followed by the dot separated IPV6 Gateway Address. The gateway addresses are separated by space.

<DNS_prim_addr>: a string parameter which shows the IP Address of the primary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.

<DNS_sec_addr>: a string parameter which shows the IP address of the secondary DNS Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of DNS Server.

<P_CSCF_prim_addr>: a string parameter which shows the IP Address of the primary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 primary Address of P-CSCF Server.

<P_CSCF_sec_addr>: a string parameter which shows the IP Address of the secondary P-CSCF Server. If the MT has dual stack capabilities the parameter shows first the dot separated IPV4 Address, followed by the dot separated IPV6 Address of P-CSCF Server.

<IM_CN_Signalling_Flag>: integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.

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

1 PDP context is for IM CN subsystem-related signalling only

<LIPA_indication>: integer type; indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE.

0 indication not received that the PDP context provides connectivity using a LIPA PDN connection

1 indication received that the PDP context provides connectivity using a LIPA PDN connection

3.9.22 AT+CGS CONTRDP

Description

The execution command returns <p_cid> and <bearer_id> for a given <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the <cid>, <p_cid> and <bearer_id> are returned for all established PDP contexts. In EPS, the Traffic Flow parameters are returned.

The test command returns a list of <cid>s associated with active contexts.

Note: Parameters for network initiated PDP contexts are returned as well. The dynamic part of the PDP context will only exist if established by the network.

Syntax

Command	Possible responses
+CGS CONTRDP=[<cid>]	+CGS CONTRDP: <cid>, <p_cid>, <bearer_id> [<CR><LF>]+CGS CONTRDP: <cid>, <p_cid>, <bearer_id> [...] OK/+CME ERROR: <err>
+CGS CONTRDP=?	+CGS CONTRDP: (list of <cid>s associated with active contexts) OK

3.9.23 AT+CGT FTRDP

Description

The execution command returns the relevant information about Traffic Flow Template of <cid> together with the additional network assigned values when established by the network. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the Traffic Flow Templates for all established PDP contexts are returned. Parameters of both network and MT/TA initiated PDP contexts will be returned.

The test command returns a list of <cid>s associated with active contexts.

Syntax

Command	Possible responses
+CGTFTRDP=[<cid>]	+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>, <direction> [<CR><LF>+CGTFTRDP: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label>, <direction> [...]] OK/+CME ERROR: <err>
+CGTFTRDP=?	+CGTFTRDP: (list of <cid>s associated with active contexts) OK

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.060 [47]

<packet filter identifier>: a numeric parameter. The value range is from 1 to 16.

<evaluation precedence index>: a numeric parameter. The value range is from 0 to 255.

<source address and subnet mask>: string type. The string is given as dot-separated numeric (0-255) parameters on the form:
"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or
"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.

<protocol number (ipv4) / next header (ipv6)>: a numeric parameter, value range from 0 to 255.

<destination port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

<source port range>: string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

<ipsec security parameter index (spi)>: numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.

<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>:

string type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".

<flow label (ipv6)>: numeric value in hexadecimal format. The value range is from 00000 to FFFF. Valid for IPv6 only.

<direction> a numeric parameter which specifies the transmission direction in which the Packet Filter shall be applied.

- 0 Pre Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162)
- 1 Uplink
- 2 Downlink
- 3 Bidirectional (Used for Uplink and Downlink)

NOTE: Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations are shown in 3GPP TS 23.060 [47].

3.9.24 AT+CGEQOSRDP

Description

The execution command returns the Quality of Service parameters <QCI>, [<DL_GBR> and <UL_GBR>] and [<DL_MBR> and <UL_MBR>] of the established PDP Context associated to the provided context identifier <cid>. If the context cannot be found an ERROR response is returned. If the parameter <cid> is omitted, the Quality of Service parameters for all established PDP contexts are returned.

The test command returns a list of <cid>s associated with active contexts.

Parameters of both network and MT/TA initiated PDP contexts will be returned.

Syntax

Command	Possible responses
+CGEQOSRDP=[<cid>]	+CGEQOSRDP: <cid>,<QCI>[,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>] [,<DL_AMBR>,<UL_AMBR>] [<CR>>LF>]+CGEQOSRDP: <cid>,<QCI>[,<DL_GBR>,<UL_GBR>,<DL_MBR>,<UL_MBR>] [,<DL_AMBR>,<UL_AMBR>] [...]] OK/+CME ERROR: <err>
+CGEQOSRDP=?	+CGEQOSRDP: (list of <cid>s associated with active contexts) OK

Defined values

<cid>: a numeric parameter which specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS.

<QCI>: a numeric parameter that specifies a class of EPS QoS. (see 3GPP TS 23.203 [85])

- 0 QCI is selected by network
- [1 – 4] value range for guaranteed bit rate Traffic Flows
- [5 – 9] value range for non-guaranteed bit rate Traffic Flows

<DL_GBR>: a numeric parameter which indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<UL_GBR>: a numeric parameter which indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<DL_MBR>: a numeric parameter which indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<UL_MBR>: a numeric parameter which indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI. (see 3GPP TS 24.301 [83])

<DL_AMBR>: integer type; indicates DL APN aggregate MBR (see 3GPP TS 24.301 [83]).
The value is in kbit/s.

<UL_AMBR>: integer type; indicates UL APN aggregate MBR (see 3GPP TS 24.301 [83]).
The value is in kbit/s.

3.9.25 AT+CGEREP

Description

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned. Read command returns the current mode and buffer settings. Test command returns the modes and buffer settings supported by the MT as compound values.

Syntax

Command	Possible responses
+CGEREP=[<mode>[,<bfr>]]	OK/+CME ERROR: <err>
+CGEREP?	+CGEREP: <mode>,<bfr> OK/+CME ERROR: <err>
+CGEREP=?	+CGEREP: <mode_min>, <mode_max>, <bfr_min>, <bfr_max> OK

Defined values

<mode>:

- 0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
- 1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.
- 2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE.

<bfr>:

- 0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered.
- 1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

Defined events

The following unsolicited result codes and the corresponding events are defined:

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

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.

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

The mobile termination has forced a context deactivation. The associated <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT.

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

The network has responded to an ME initiated Traffic Flow activation request with an EPS bearer activation or modification. The associated MT allocated context identifier <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT

+CGEV: NW ACT <p_cid>, <cid>

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.

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 active contexts have been deactivated. These are not reported separately.

+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.

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

The mobile termination has activated a PDN connection. The format of the parameter <cid> is 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.
- 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.

<cid_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from

TE, and MT has activated the PDN connection or PDP context associated with <cid_other>.

+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 PDN connection. The associated <cid> is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

+CGEV: EPS ACT <cid>

The network has activated a PDP context. The associated <cid> is provided to the TE, its format is found in command +CGDCONT.

+CGEV: EPS MODIFY <cid>, <change_reason>

The network has modified EPS bearer context parameter(s). The associated <cid> is provided to the TE in addition of the change reason: TFT and/or QoS modification. The format of the parameter <cid> is found in command +CGDCONT.

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

1: TFT only changed

2: Qos only changed

3: Both TFT and QoS changed

+CGEV: NW REATTACH

ASR internal definition. Used to notify IMS the NW reattach action

3.9.26 AT+CVMOD

Description

Set command selects the voice call mode for making a Mobile Originated voice call from the UE. The voice call mode can be CS_ONLY, VOIP_ONLY, CS_PREFERRED or VOIP_PREFERRED. Type of VoIP session preferred (e.g. SIP VoIP, IMS VoIP) is manufacturer specific issue.

Note 1:

If the Call Mode is set to CS_ONLY, then the ATD command will make a call in CS mode.

If the Call Mode is set to VOIP_ONLY, then the ATD command will make a call in VoIP mode.

If the Call Mode is set to CS_PREFERRED, then the ATD command gives preference for CS based voice call.

If the Call Mode is set to VOIP_PREFERRED, then the ATD command gives preference for VoIP based voice call.

NOTE 2: The preferences are not applicable for the emergency call.

NOTE 3: The preferences are not applicable if operator has set preferences for UE originated calls/sessions, 3GPP TS 24.216 [75] subclause 5.6.

Syntax

Command	Possible responses
+CVMOD=[<voice_mode>]	OK/+CME ERROR: <err>
+CVMOD?	+CVMOD: <voice_mode> OK/+CME ERROR: <err>
+CVMOD=?	+CVMOD: (list of supported <voice_mode>s) OK

3.9.27 AT+CEMODE

Description

The set command is used to set the MT to operate according to the specified mode of operation for EPS, see 3GPP TS 24.301 [83]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology.

The test command is used for requesting information on the supported MT mode of operation.

Syntax

Command	Possible responses
+CEMODE=[<mode>]	OK/+CME ERROR: <err>
+CEMODE?	+CEMODE: <mode> OK/+CME ERROR: <err>
+CEMODE=?	+CEMODE: (list of supported <mode>s) OK

Defined Values

<mode>: a numeric parameter which indicates the mode of operation

- 0 PS mode 2 of operation
- 1 CS/PS mode 1 of operation
- 2 CS/PS mode 2 of operation
- 3 PS mode 1 of operation

NOTE: the definition for UE modes of operation can be found in 3GPP TS 24.301 [83]

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

3.9.28 AT+CGPADDR

Description

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

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

Syntax

Command	Possible responses
+CGPADDR=[<cid> [<cid> [...]]]	+CGPADDR: <cid>,<PDP_addr_1>[,<PDP_addr_2>] [<CR><LF><cid>,<PDP_addr_1>[,<PDP_addr_2>] [...]] OK/+CME ERROR: <err>
+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK

Defined Values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_addr_1> and <PDP_addr_2>: each is a string type 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>. Both <PDP_addr_1> and <PDP_addr_2> are omitted if none is available. Both <PDP_addr_1> and <PDP_addr_2> are included when both IPv4 and IPv6 addresses are assigned, with <PDP_addr_1> containing the IPv4 address and <PDP_addr_2> containing the IPv6 address.

3.9.29 AT+CGCLASS

Description

The set command is used to set the MT to operate according to the specified mode of operation, see 3GPP TS 23.060 [47]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology. If no value has been set by the TE previously, the return value shall be the highest mode of operation that can be supported by the MT.

The test command is used for requesting information on the supported MT mode of operation.

Syntax

Command	Possible responses
+CGCLASS= [<class>]	OK/+CME ERROR: <err>
+CGCLASS?	+CGCLASS: <class> OK/+CME ERROR: <err>
+CGCLASS=?	+CGCLASS: (list of supported <class>s) OK

Defined Values

<class>: a string parameter which indicates the mode of operation

- A Class-A mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode) (highest mode of operation)
- B Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode)
- CG Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode)
- CC Class-C mode of operation in CS only mode (A/Gb mode), or CS (Iu mode) (lowest mode of operation)

NOTE:

<class> A means that the MT would operate simultaneous PS and CS service

<class> B means that the MT would operate PS and CS services but not simultaneously in A/Gb mode

<class> CG means that the MT would only operate PS services

<class> CC means that the MT would only operate CS services

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

If the MT is attached to the PS domain when the set command is issued with a <class> = CC specified, a PS detach shall be performed by the MT.

3.9.30 AT+CGPIAF

Description

Set command decides what format to print IPV6 address parameters of other AT commands. See RFC 4291 [88] for details of the IPv6 address format.

The +CGPIAF parameters <IPv6_AddressFormat>, <IPv6_SubnetNotation>, <IPv6_LeadingZeros> and <IPv6_CompressedZeros> affect the following commands and parameters:

- a) in +CGTFT and +CGTFTRDP, the <remote address and subnet mask>;
- b) in +CGDCONT, the <PDP_addr>;
- c) in +CGPADDR, the <PDP_addr_1> and <PDP_addr_2>;
- d) in +CGCONTRDP, the <local address and subnet mask>, <DNS_prim_addr>, <DNS_sec_addr>, <P_CSCF_prim_addr> and <P_CSCF_sec_addr>.

Read command returns the current command parameter settings.

Test command returns values supported as compound values.

Syntax

Command	Possible responses
AT+CGPIAF=[<IPv6_AddressFormat>[,<IPv6_SubnetNotation>[,<IPv6_LeadingZeros>[,<IPv6_CompressedZeros>]]]]	OK/+CME ERROR:<err>
AT+CGPIAF?	+CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressedZeros>
AT+CGPIAF=?	+CGPIAF: (list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressedZeros>s)

<IPv6_CompressZeros>s

Defined values

<IPv6_AddressFormat>: integer type, decides the IPv6 address format. Relevant for all AT command parameters that can hold an IPv6 address.

- 0 Use IPv4-like dot-notation. IP address, and subnetwork mask if applicable, are dot-separated.

Example: For <remote address and subnet mask>:

"32.1.13.184.0.0.205.48.0.0.0.0.0.0.255.255.255.255.255.255.240.0.0.0.0.0.0.0.0"
0"

For other IP address parameters:

"32.1.13.184.0.0.205.48.0.0.0.0.0.0.0"

- 1 Use IPv6-like colon-notation. IP address, and subnetwork mask if applicable and when given explicitly, are separated by a space.

Example: For <remote address and subnet mask>:

"2001:0DB8:0000:CD30:0000:0000:0000:0000
FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000"

For other IP address parameters:

"2001:0DB8:0000:CD30:0000:0000:0000:0000"

<IPv6_SubnetNotation>: integer type, decides the subnet-notation for <remote address and subnet mask>. Setting does not apply if <IPv6_AddressFormat> = 0.

- 0 Both IP Address and subnet mask are stated explicitly, separated by a space.

Example:

"2001:0DB8:0000:CD30:0000:0000:0000:0000 FFFF:FFFF:FFFF:FFF0:0000:0000:0000:0000"

- 1 The printout format is applying / (forward slash) subnet-prefix Classless Inter-Domain Routing (CIDR) notation.

Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000/60"

<IPv6_LeadingZeros>: integer type, decides whether leading zeros are omitted or not. Setting does not apply if <IPv6_AddressFormat> = 0.

- 0 Leading zeros are omitted.

Example: "2001:DB8:0:CD30:0:0:0:0"

- 1 Leading zeros are included.

Example: "2001:0DB8:0000:CD30:0000:0000:0000:0000"

<IPv6_CompressZeros>: integer type, decides whether 1-n instances of 16-bit zero-values are replaced by only '::'. This applies only once. Setting does not apply if <IPv6_AddressFormat> = 0.

- 0 No zero compression.

Example: "2001:DB8:0:CD30:0:0:0:0"

- 1 Use zero compression.

Example: "2001:DB8:0:CD30::"

3.9.31 AT*AUTHReq

Description

This proprietary AT command is used to requests to add authentication parameters to a defined PDP context. The command must be sent after the PDP context was defined and before the PDP context is activated. The authentication parameters will be sent to the GGSN in a protocol configuration information entry, when PDP context is activated.

In case authentication parameters are already defined for this PDP context the new authentication parameters will replace the existing parameters. Set authentication type to none will delete authentication parameters defined for this PDP context.

Syntax

Command	Possible responses
AT*AUTHReq=<cid>,<type>[,<UserName>[,<Password>]]	OK/+CME ERROR: <err>
AT*AUTHReq=?	*AUTHReq: <cid>,<type>(0-None;1-PAP;2-CHAP),<UserName>,<Pass word> OK

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands)

<type>: (Authentication Protocol type) a numeric parameter which specifies the type of authentication data protocol

0 - None

1 - PAP (Password Authentication Protocol)

2 - CHAP (Challenge Handshake Authentication Protocol)

<Username>: a string parameter that specifies a user name added in PPP authentication packet and sent to server for authentication

<Password>: a string parameter that specifies a password added in PPP authentication packet and sent to server for authentication

Note: The example when use this AT command is as following:

AT*AUTHReq=1,1,ASR,123456

OK

AT*AUTHReq=?

*AUTHReq:<cid>,<type>(0-None;1-PAP;2-CHAP),<UserName>,<Password>

OK

3.9.32 Unsolicited result code: +CGEV

Description

Indication from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. Refer to the details in **AT+CGEREP**

Syntax

+CGEV: XXX

3.9.33 AT*FASTDORM

Description

This proprietary AT command is used to make the device to initiate exit from DCH or FACH/ PCH when the application knows that there is no more packet data expected.

Syntax

Command	Possible responses
*FASTDORM	OK/+CME ERROR: <err>

*FASTDORM =?	OK
--------------	----

3.9.34 AT*FDY

Description

This proprietary AT command is used to enable/disable Fast Dormancy Timer.

Syntax

Command	Possible responses
AT*FDY=<enable>,< lcdOnTimerInterval>,<lcdOffTimerInter val>,<rel8LcdOnTimerInterval>,<rel8Lc dOffTimerInterval> Parameter: <enable>: integer type 0 disable PS power consuming control 1 enable PS power consuming control <lcdOnTimerInterval>,< lcdOffTimerInterval>,< rel8LcdOnTimerInterval>,< rel8LcdOffTimerInterval >: integer type, [1~0x7FFFFFFF] in ms. If this parameter is not present, the default value is 5000.	OK/+CME ERROR:<err> Example: AT*FDY =1,10000 OK AT*FDY =1 OK AT*FDY= 0 OK

3.9.35 AT*CGATT

Description

This proprietary AT command is used to enable/disable auto attach when power on.

Syntax

Command	Possible responses
AT*CGATT=<state> <state>: 0 disable auto attach when power on 1 enable auto attach when power on	OK/+CME ERROR:<err> Example: AT*CGATT =0 OK AT*CGATT =1 OK
AT*CGATT?	*CGATT:<state> OK/+CME ERROR:<err>
AT*CGATT =?	*CGATT: (0,1) OK

3.9.36 AT*CGDFLT

Description

This proprietary AT command is used to set/get default PDP context info under LTE.

Syntax

Command	Possible responses
AT*CGDFLT = <mode>,[<PDP_type>,[<APN>,[<emg_in_d>,[<ipcp_req>,[<pcscf_v6>,[<imcn_sig>,[<dns_v6>,[<nw_bear>,[<dsm_v6_ha>,[<dsm_v6_pref>,[<dsm_v6_ha_v4>,[<ip_via_nas>,[<ip_via_dhcp>,[<pcscf_v4>,[<dns_v4>,[<msisdn>,[<ifom>,[<v4mtu>,[<local_tft>,[<etif>]]]]]]]]]]]]]	OK/+CME ERROR:<err>
AT*CGDFLT?	*CGDFLT:<PDP_type>,[<APN>,[<emg_ind>,[<ipcp_re_q>,[<pcscf_v6>,[<imcn_sig>,[<dns_v6>,[<nw_bear>,[<dsm_v6_ha>,[<dsm_v6_pref>,[<dsm_v6_ha_v4>,[<ip_via_nas>,[<ip_via_dhcp>,[<pcscf_v4>,[<dns_v4>,[<msisdn>,[<ifom>,[<v4mtu>,[<local_tft>,[<etif>]]]]]]]]]]]]]]]]] OK/+CME ERROR:<err>

Defined values

<mode>: integer type; indicates whether saved to NVM.

0 - not save to NVM

1 - save to NUM

<PDP_type>: string type; specifies the type of packet data protocol

IP Internet Protocol (IETF STD 5)

IPv6 Internet Protocol, version 6 (IETF RFC 2460)

IPv4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301 [83])

<APN>: string type; used to select the GGSN or the external packet data network.

<emg_ind>: integer type; indicates whether it's for emergency bear.

0 – the default PDP Context isn't for emergency bear

1 – the default PDP Context is for emergency bear

<ipcp_req>: integer type; indicates whether need IPCP protocol.

0 – doesn't need IPCP protocol

1 – need IPCP protocol

<pcscf_v6>: integer type; P-CSCF ipv6 address request.

0 – doesn't need P-CSCF ipv6 address

1 – need P-CSCF ipv6 address

<imcn_sig>: integer type; indicates whether the PDP context is for IM CN subsystem-related signalling only or not..

0 - the PDP context is not for IM CN subsystem-related signalling only

1 - the PDP context is for IM CN subsystem-related signalling only

<dns_v6>: integer type; DNS Server IPv6 Address Request.

0 – doesn't need DNS Server IPv6 Address

1 – need DNS Server IPv6 Address

<nw_bear>: integer type; MS support of Network Requested Bearer Control indicator.

0 – not support

1 – support

<dsm_v6_ha>: integer type; DSMIPv6 HOME agent address request.

0 – doesn't need DSMIPv6 HOME agent address

1 – need DSMIPv6 HOME agent address

<dsm_v6_pref>: integer type; DSMIPv6 HOME network Prefix Request.

0 – doesn't need DSMIPv6 HOME network Prefix

1 – need DSMIPv6 HOME network Prefix

<dsm_v6_ha_v4>: integer type; DSMIPv6 IPv4 Home Agent Address Request.

0 – doesn't need DSMIPv6 IPv4 Home Agent Address

1 – need DSMIPv6 IPv4 Home Agent Address
 <ip_via_nas>: integer type; IP address allocation via NAS signalling.
 0 –IPv4 address allocation isn't via signalling
 1 –IP address allocation via NAS signalling
 <ip_via_dhcp>: integer type; IPv4 address allocation via DHCPv4.
 0 – IPv4 address allocation isn't via DHCPv4
 1 – IPv4 address allocation via DHCPv4
 <pcscf_v4>: integer type; P-CSCF IPv4 Address Request.
 0 – doesn't need P-CSCF IPv4 Address
 1 – need P-CSCF IPv4 Address
 <dns_v4>: integer type; DNS Server IPv4 address Request.
 0 – doesn't need DNS Server IPv4 address
 1 – need DNS Server IPv4 address
 <msisdn>: integer type; MSISDN Request.
 0 – doesn't need MSISDN
 1 – need MSISDN
 <ifom>: integer type; IFOM-Support-Request.
 0 – doesn't need IFOM-Support
 1 – need IFOM-Support
 <v4mtu>: integer type; IPv4 Link MTU Request.
 0 – doesn't need IPv4 Link MTU
 1 – need IPv4 Link MTU
 <local_tft>: integer type; MS support of Local address in TFT indicator.
 0 – support
 1 – not support
 <etif>: integer type; provide PCO or APN in UE side or network side.
 0 – provide related info by network side.
 1 – provide related info by UE side.

3.9.37 AT+VZWAPNE

Description

This proprietary AT command is used to set/get APN list.
 Set command causes the APN table on the DUT to be overwritten. One Set command must be issued for each APN edit.
 Read command queries the APN table that is currently on the DUT, starting from the first entry to the last. Test command returns the supported entry values.

Syntax

Command	Possible responses
AT+VZWAPNE=<wapn>,<apncl>,<apnni>,<apntype>,<apnb>,<apned>,<apntime>	OK/+CME ERROR:<err>
AT+VZWAPNE?	+VZWAPNE:<apncl>,<apnni>,<apntype>,<apnb>,<apned>,<apntime> OK

Defined values

<wapn>: Integer type; Indicates which APN entry to edit. The maximum number of APNs being “n”.
 0 Take no action

1 Edit APN entry #1
 2 Edit APN entry #2
 3 Edit APN entry #3
 4 Edit APN entry #4
 n Edit APN entry #n

<apnc1>: Integer type; Indicates the APN Class. The maximum number of APNs being “n”.
 1 APN Class #1
 2 APN Class #2
 3 APN Class #3
 4 APN Class #4
 n APN Class #n

<apnni>: String type; Indicates the Network Identifier.
 VZWIMS Verizon Wireless IMS PDN
 VZWADMIN Verizon Wireless Administrative PDN
 VZWINTERNET Verizon Wireless Internet PDN
 VZWAPP Verizon Wireless Application PDN

<apntype>: String type; APN type.
 IPv4 IPv4 type
 IPv6 IPv6 type
 IPv4v6 IPv4 and IPv6 type

<apnb>: String type; APN Bearer.
 LTE LTE bearer used

<apned>: String type; Enable/Disable the APN.
 Enabled The APN is enabled
 Disabled The APN is disabled

<apntime>: Integer type; APN inactivity timer value.
 0 indicates that the timer is infinity
 x indicates the timer value in minutes

3.9.38 AT*VZWTESTAPP

Description

This proprietary AT command is used for VZW application test.

Syntax

Command	Possible responses
AT*VZWTESTAPP=<apn>,<state>[,<period>]	OK/+CME ERROR:<err>

Defined values

<apn>:

Access point name, by now: "VZWIMS", "VZWINTERNET" support.

<state>:

- 0 - primary pdp disconnected
- 1 - primary pdp idle
- 2 - primary pdp Transmitting
- 3 - secondary pdp disconnected
- 4 - secondary pdp idle
- 5 - secondary pdp transmitting

<period>:

only valid when <state> = 2

Logical:

- 1> If "apn" not valid (not "VZWIMS" & "VZWINTERNET"), just do nothing.
- 2> <state> = 0, do nothing by now
 - <state> = 1
 - a> If PS attached, if "apn" has PDN connection, do nothing.
 - b> If PS attached, if "apn" has no PDN connection, just trigger "AT+CGDCONT=x,x,x" & "AT+CGDATA" to set up the PDN connection, and start 5 seconds timer, after timer expire, re-check again.
 - c> If PS not attached, just start a 5 seconds timer, do nothing, after timer expire, re-check again.
 - <state> = 2
 - a> If PS attached, if "apn" has PDN connection, just send the PS data (send LteSnMultiDataReq to RABM), and start a <period> timer, after timer expire, re-check again.
 - b> If PS attached, if "apn" has no PDN connection, just trigger "AT+CGDCONT=x,x,x" & "AT+CGDATA" to set up the PDN connection, and start 5 seconds timer, after timer expire, re-check again.
 - c> If PS not attached, just start a 5 seconds timer, do nothing, after timer expire, re-check again.
 - <state> = 3, do nothing by now
 - <state> = 4
 - a> If PS attached, if "apn" has dedicate PDN connection, do nothing.
 - b> If PS attached, if "apn" has no dedicate PDN connection, just trigger "AT+CGDSCONT=x,x,x" & "AT+CGDATA" to set up the dedicate PDN connection, and start 5 seconds timer, after timer expire, re-check again.
 - c> If PS not attached, just start a 5 seconds timer, do nothing, after timer expire, re-check again.
 - <state> = 5
 - a> If PS attached, if "apn" has dedicate PDN connection, just send the PS data (send LteSnMultiDataReq to RABM), and start a <period> timer, after timer expire, re-check again.
 - b> If PS attached, if "apn" has no dedicate PDN connection, just trigger "AT+CGDSCONT=x,x,x" & "AT+CGDATA" to set up the dedicate PDN connection, and start 5 seconds timer, after timer expire, re-check again.
 - c> If PS not attached, just start a 5 seconds timer, do nothing, after timer expire, re-check again.

3.9.39 AT+CVDP

Description

The set command is used to set the MT to operate according to the specified voice domain preference for UTRAN.

The read command returns the setting, independent of the current serving cell capability and independent of the current serving cell's access technology.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
AT+CVDP=<setting>]	
AT+CVDP?	+CVDP: <setting>
AT+CVDP=?	+CVDP: (list of supported <setting>s)

3.9.40 AT+CEVDP

Description

The set command is used to set the MT to operate according to the specified voice domain preference for E-UTRAN.

The read command returns the setting, independent of the current serving cell capability and independent of the current serving cell's access technology.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
AT+CEVDP=[<setting>]	
AT+CEVDP?	+CEVDP: <setting>
AT+CEVDP=?	+CEVDP: (list of supported <setting>s)

3.9.41 AT+CEUS

Description

The set command is used to set the MT to operate according to the specified UE's usage setting for EPS.

The read command returns the usage setting set by the TE.

The test command is used for requesting information on the supported MT setting(s) as a compound value.

Syntax

Command	Possible responses
AT+CEUS=[<setting>]	
AT+CEUS?	+CEUS: <setting>
AT+CEUS=?	+CEUS: (list of supported <setting>s)

3.9.42 AT+CMMIVT

Description

The set command is used to set the MT to perform additional procedures as specified in 3GPP TS 24.008 and 3GPP TS 24.301 to support terminating access domain selection by the network.

The read command returns the setting, independent of the current serving cell capability and independent of the current serving cell's access technology.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
AT+CMMIVT=[<setting>]	
AT+CMMIVT?	+CMMIVT: <setting>

AT+CMMIVT=?	+CMMIVT: (list of supported <setting>s)
-------------	---

3.9.43 AT*CIIND

Description

The set command is used to notify CP the current IMS registration state. IMS stack should use this command to notify CP on the completion of initialization and every time its registration state change occurs.

Syntax

Command	Possible responses
AT*CIIND=<reg_state> Notes: <reg_state>: integer type. Indicates the IMS registration state. 0 – IMS is not registered 1 – IMS is registered	OK/+CME ERROR: <err>

3.9.44 AT*IMSSRV

Description

The set command is used to request to set the service status of IMS

Syntax

Command	Possible responses
AT*IMSSRV=< imsSrvType >,< imsSrvStatus >,< srvFailCause > Notes: < imsSrvType >: integer type. Indicates IMS service type. 0 – IMS MO CALL 1 – IMS SMS 2 – IMS SS 3 – IMS EMERGENCY CALL 4 – IMS REGISTER 5 – IMS Deregister 6 – IMS MT CALL < imsSrvStatus >: integer type. Indicates IMS service status. 0 – service start 1 – service end 2 – service failed < srvFailCause >: integer type. Indicates the cause of service fail. 0 – no cause 1 – CS fail CSFB follow 2 – CS call fail due to cancelled by network 3 – bootup	*IMSSRV: <result> OK/+CME ERROR: <err>

<result>: integer type. Indicates the result of service status request 0 – success 1 – failed, another card is doing CS service 2 – failed, another card is doing high priority service, ims will redial later	
* IMSSRV =?	* IMSSRV: (0-6),(0-2),(0-3) OK

3.9.45 AT*PSDC

Description

The set command is used to enable/disable PS service

Syntax

Command	Possible responses
AT*PSDC=<enable> Notes: < enable >: integer type. 0 – disable PS service 1 – enable PS service	OK/+CME ERROR: <err>
*PSDC?	*PSDC: < enable > OK Example: *PSDC: 0 OK
*PSDC=?	*PSDC: (0,1) OK

3.10 MS Commands

3.10.1 AT+CMGF

Description

Set command tells the TA, which input and output format of messages to use.

Test command returns supported modes as a compound value.

Syntax

Command	Possible responses
+CMGF=<mode>	OK/+CMS ERROR: <err>
+CMGF?	+CMGF: <mode> OK Example: +CMGF: 0 OK
+CMGF=?	+CMGF: (0,1) OK

Defined Values

- <mode>:
- 0 PDU mode (default when implemented)
 - 1 text mode

3.10.2 AT+CMSS

Description

This command sends message with location value <index> from preferred message storage to the network.

Syntax

Command	Possible responses
+CMSS=<index>[,<da>[,<toda>]]	if sending successful: +CMSS: <mr> OK if sending fails: +CMS ERROR: <err>
+CMSS=?	OK

3.10.3 AT+CMGS

Description

This command transmits SMS message from TE to network in text or PDU mode.

Syntax

Command	Possible responses
if PDU mode (+CMGF=0): +CMGS=<length><CR> PDU is given<ctrl-Z/ESC>	if sending successful: +CMGS: <mr> OK if sending fails: +CMS ERROR: <err>
if text mode (+CMGF=1): +CMGS=<da>[,<toda>]<CR> text is entered<ctrl-Z/ESC>	
+CMGS=?	OK

3.10.4 AT+CMGR

Description

This command retrieves a message from the short message storage. The short message storage being used is defined by the command +CPMS

Syntax

Command	Possible responses
+CMGR=<index>	if PDU mode (+CMGF=0) , command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> OK if text mode (+CMGF=1), command successful and SMS-DELIVER:

	+CMGR:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> OK if text mode (+CMGF=1), command successful and SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> OK otherwise: +CMS ERROR: <err>
+CMGR=?	OK

3.10.5 AT+CMGW

Description

This command stores a message in memory storage. Memory location <index> of the stored message is returned.

Syntax

Command	Possible responses
if text mode (+CMGF=1): +CMGW=<oa/da>[,<tooa/toda>[,<stat>]]<CR> text is entered<ctrl-Z/ESC> if PDU mode (+CMGF=0): +CMGW=<length>[,<stat>]<CR>PDU is given<ctrl-Z/ESC> +CMGW=?	if sending successful: +CMGW: <index> OK if sending fails: +CMS ERROR: <err> OK

Layout of SMS-SUBMIT in PDU Mode

Reference	Description	Length
<sca>	Service Center address: 1 BYTE: length (number of followed octets). Mandatory 1 BYTE: <tosca> - value between 128-255	1, 3-12 BYTES (When length is 1, length BYTE = 0)
<fo>	First Octet.	1 BYTE
<TP-MR>	Message Reference. An integer representation of a reference number of the SM submitted to the SC by the MS. Values between 0-255.	1 BYTE
<TP-DA>	Destination address formatted according to the formatting rules of address fields.	2-12 BYTES
<TP-PID>	Protocol-Identifier. Values between 0-255.	1 BYTE
<TP-DCS>	Data Coding Scheme. Values between 0-255.	1 BYTE
<TP-UDL>	User data length	1 BYTE
<TP-UD>	User data	0-140 BYTES

3.10.6 AT+CSCA

Description

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

Syntax

Command	Possible responses
+CSCA=<sca>[,<tosca>]	OK/+CMS ERROR: <err>
+CSCA?	+CSCA: <sca>,<tosca> OK Example: +CSCA: "8613010314500",145 OK
+CSCA=?	OK

3.10.7 AT+CSCB

Description

Set command selects which types of CBMs are to be received by the ME.

Test command returns supported modes as a compound value.

Syntax

Command	Possible responses
+CSCB=<mode>,<mids>[,<dcss>] Note: <mode>: 0: message types specified in <mids> and <dcss> are accepted 1: message types specified in <mids> and <dcss> are not accepted <mids>: string type; all different possible combinations of CBM message identifiers (default is empty string); e.g. "0,1,5,8-9". Valid value range is [0-999] and max number supported is 30. <dcss>: string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5" Valid value range is [0-63] and max number supported is 30.	OK/+CMS ERROR: <err>
+CSCB?	+CSCB:<mode>,<mids>,<dcss> OK Example: +CSCB:1, "0,1,5,8-9","0-3,5" OK
+CSCB=?	+CSCB:(0,1) OK

3.10.8 AT*CSCB

Description

Set command selects which types of CBMs are to be received by the ME.

Test command returns supported modes as a compound value.

Syntax

Command	Possible responses
AT*CSCB=<mode>,<mids>[,<dcss>[,<enableAll>[,<DisableDcss>]]] Note: <mode>: 0: message types specified in <mids> and <dcss> are accepted 1: message types specified in <mids> and <dcss> are not accepted <mids>: string type; all different possible combinations of CBM message identifiers (default is empty string); e.g. "0,1,5,8-9". Valid value range is [0-999] and max number supported is 30. <dcss>: string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5" Valid value range is [0-63] and max number supported is 30. <enableAll>: 1: Receive all cell broadcast messages 0: Filter cell broadcast messages according to CBMI and data coding schemes < DisableDcss>: 1: Disable filtering of cell broadcast messages according to data coding schemes 0: Enable filtering of cell broadcast messages according to data coding schemes	OK/+CMS ERROR:<err>
AT*CSCB?	*CSCB:<mode>,<mids>,<dcss>,<enableAll>,<DisableDcss> OK Example; *CSCB:1, "0,1,5,8-9","0-3,5",1,1 OK
AT*CSCB=?	*CSCB:(0,1) OK

3.10.9 AT*CBMCS

Description

This proprietary AT command is used to set/get a CBM filter setting that decides which types of CBM are to be received by the ME.

Syntax

Command	Possible responses
AT*CBMCS=<enableAll>[,<disableCb>] < enableAll >:integer type 0: filter cell broadcast messages according to CBMI and data coding schemes 1: receive all cell broadcast messages	OK/+CME ERROR:<err>

< disableCb >:integer type 0: enable CBS feature 1: disable CBS feature	
AT*CBMCS?	*CBMCS:<enableAll>,<disableCb> OK
AT*CBMCS=?	*CBMCS:(0,1), (0,1) OK

3.10.10 AT+CNMI

Description

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON.

Test command gives the settings supported by the TA as compound values.

Syntax

Command	Possible responses
+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]] Note: <mode> 0: Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. 1: Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE. 2: Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. 3: Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.	OK/+CMS ERROR: <err>
+CNMI? 	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK Example: +CNMI:1,2,2,1,1 OK
+CNMI=?	+CNMI: (0-3),(0-3),(0,2),(0-1),(0-1) OK

3.10.11 AT+CGSMS

Description

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

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

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

Syntax

Command	Possible responses
+CGSMS= <service> Note: <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)	OK/+CMS ERROR:<err>
+CGSMS?	+CGSMS: <service> OK Example: +CGSMS:3 OK
+CGSMS=?	+CGSMS: (0-3) OK

3.10.12 AT+CMMS

Description

Set command controls the continuity of SMS relay protocol link.

Test command returns supported values as a compound value.

Syntax

Command	Possible responses
+CMMS=<n> Note: <n>: 0: disable 1: keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0 2: enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <n>=0)	OK/+CMS ERROR: <err>
+CMMS?	+CMMS: <n> OK Example: +CMMS:0 OK
+CMMS=?	+CMMS: (0,1,2) OK

3.10.13 AT+CMGD

Description

This command deletes message from preferred message storage <mem1> location <index>.

Syntax

Command	Possible responses
+CMGD=<index>[,<deflag> Note: <deflag>: 0 Deletes the message specified in <index> 1 Deletes all read messages 2 Deletes all read messages and sent MO messages 3 Deletes all read messages, sent and unsent MO messages 4 Deletes all messages Note: Now Only support 0 and 4	OK/+CMS ERROR: <err>
+CMGD=?	+CMGD: (list of valid <index>s), (list of valid <deflag>s) OK Example: +CMGD:(1,3,4,5),(0-4) OK

3.10.14 AT+CMGL

Description

Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE.

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

Syntax

Command	Possible responses
+CMGL[=<stat>]	if PDU mode(+CMGF=0), command successful +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu> [<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu> [...]] OK if text mode (+CMGF=1), command successful and SMS-DELIVERS: +CMGL:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[<CR><LF>+CMGL:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[...]] OK if text mode (+CMGF=1), command successful and SMS-SUBMITS: +CMGL: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>[<CR><LF>+ CMGL:<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>[...]]

	OK otherwise: +CMS ERROR: <err> Example: +CMGL: 4,,147 0891683110304105F24008A101563530000401105291831523820605040B8 423F0EA06246170706C69636174696F6E2F766E642E7761702E6D6D732D 6D65737361676500B487AF848C82985A546D4142745443 OK +CMGL: 6,,153 0891683110503905F0000BA13151621597F4000801106290706123865E7F5 BCC6C7D8D384F18552E5C0F8F6622365B9D9A6CFF154E07002C59658F EAFF144E07002C4E307530672C7530FF134E07002C5E1586 OK
+CMGL=?	if PDU mode (+CMGF=0) +CMGL: (0-4) OK if text mode (+CMGF=0) +CMGL: "REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL" OK

3.10.15 AT+CSMS

Description

Set command selects messaging service <service>.

Test command returns a list of all services supported by the TA.

Read command returns supported message types along the current service setting.

Syntax

Command	Possible responses
+CSMS=<service>	+CSMS: <mt>,<mo>,<bm> OK/+CMS ERROR: <err>
+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm> OK Example: +CSMS: 0,1,1,1 OK
+CSMS=?	+CSMS: (0,1) OK

3.10.16 AT+CSMP

Description

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>. If TA supports the EVPF, see 3GPP TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes.

NOTE: When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for <scts>.

Syntax

Command	Possible responses
+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	OK/CME ERROR 1
+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs> OK
+CSMP=?	OK

3.10.17 AT+CPMS

Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.

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

Syntax

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

3.10.18 AT*CNMA

Description

This proprietary AT command is based on AT+CNMA which is used to send ACK for a received SMS. The standard AT command does not have parameters. If want to use +CNMA, the syntax is same as *CNMA.

Syntax

Command	Possible responses
if PDU mode (+CMGF=0): *CNMA[=<n>] if text mode (+CMGF=1): *CNMA Example: When received a SMS indication (+CMT), AP should send this command as an ACK with a proper parameter according to its memory status.	*CNMA: <val> OK/+CME ERROR: <err>

AT*CNMA =?	*CNMA:(0-2) OK
------------	-------------------

Defined values

<n>:
 0 – success
 1 – Memory full
 2 – General error

3.10.19 Unsolicited result code: +MMSG

Description

ASR extended AT command to Indicate an Short Messages Storage status change

Syntax

+MMSG: <smsReady>, <smsFull>

Defined Values

<smsReady>: indicates if the SIM is ready for SMS

0 not ready
 1 ready

<smsFull>: indicates if the memory capacity of SIM for SMS has been reached

0 not reached
 1 reached

Example:

+MMSG: 1, 0

+MMSG: 1, 1

3.10.20 Unsolicited result code: +CMTI

Description

The +CMTI unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SM, if the +CNMI parameter <mt> is set to 1.

This unsolicited message indicates that a new SMS-DELIVER message was received, and is stored in location <index>:

Syntax

+CMTI: <mem>, <index>

Defined Values

<mem> : string type, memory to which received SMS are preferred to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI)

BM: broadcast message storage
 ME: ME message storage
 MT: any of the storages associated with ME

SM: SIM message storage

SR: status report storage

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

Example:

+CMTI: "ME",2

3.10.21 Unsolicited result code: +CMT

Description

The +CMT unsolicited response is sent to the TE upon receipt of a new SMS-DELIVER SM if the +CNMI parameter <mt> is set to 2.

This unsolicited message displays the received SMS-DELIVER message:

Syntax

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

+CMT: <oa>, [<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (Text mode)

Defined Values

PDU mode:

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

<length>: the length of the actual TP data unit in octets

<pdu>: Message header and contents in PDU mode format.

Text mode:

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

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

<scts>: TP-Service-Centre-Time-Samp in time-string format

<tooa>: TP-Originating-Address Type-of-Address octet in integer format

<fo>: first octet of SMS-DELIVER in integer format

<pid>: TP-Protocol-Identifier in integer format

<dcs>: SMS Data Coding Scheme

<sca>: RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set.

<tosca>: RP SC address Type-of-Address octet in integer format

<length>: the length of the message body <data>

<data>: Message contents.

Example:

+CMT: ,23

0791795212010095040C917952446505430004502032115430800441424344

+CMT: "+972544565034",,"04/11/04,09:48:36 GMT+08"

ABC

3.10.22 Unsolicited result code: +CBM

Description

The +CBM unsolicited response is sent to the TE upon receipt of a new cell broadcast message if +CNMI parameter <bm> is set to 2.

This unsolicited message displays the received CB message. The displayed CBM is not saved in message storage. (only support PDU mode)

Syntax

+CBM: <length><CR><LF><pdu>

Defined Values

<length>: Size of message in PDU mode format, in octets.

<pdu>: Message header and contents in PDU mode format.

3.10.23 Unsolicited result code: +CDS

Description

Received SMS status report content (only PDU mode supported).

Syntax

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

3.10.24 AT+CMEFULL

Description

Report to network whether there is storage available for new SMS messages. The PS will send the network an indication that memory is full if memory capacity is exceeded, if there is enough memory to receive at least one SMS, the PS will send the network an indication that memory is available for storing new messages, then the network can start forwarding the pending messages that were held due to memory full status.

Syntax

Command	Possible responses
AT+CMEFULL=<memFull> <memFull>:	OK/+CMS ERROR: <err>

0 memory is not full 1 memory is full (Note)	
Note: this option is protected by special MACRO, by default the MACRO is not defined so the option has no effect.	
AT+CMEFULL=?	+CMEFULL: (0,1) OK

3.11 ASR Factory Commands

3.11.1 AT*MRD_CDF

Description

This is a generic AT command for copying an existing file into factory, for example, it can be used when RF calibration is done and copy the calibration nvm files into factory. This command can only be used in production mode (send AT*PROD=1 will enter production mode).

Syntax

Command	Possible responses
*MRD_CDF=<a>,<f>[,<v>,<d>]	If <a>=W OK <ul style="list-style-type: none"> - if no error happens +CMEM ERROR: <err> <ul style="list-style-type: none"> - if UE is not in production mode - if file already exist in factory - if any parameters are not right - if error when write factory If <a>=U OK <ul style="list-style-type: none"> - if no error happens +CMEM ERROR: <err> <ul style="list-style-type: none"> - if UE is not in production mode - if any parameters are not right - if error when write factory if <a>=D OK <ul style="list-style-type: none"> - if no error in deleting (1) - if file does not exist (2) If <a>=Q OK <ul style="list-style-type: none"> - if file exists in factory (exist) - if file does not exist in factory (not exist)
*MRD_CDF=?	*MRD_CDF=<a>,<f>[,<v>,<d>]

Defined values

<a>:

W: write file to factory

U: update file to factory
D: delete file from factory
Q: query file
<f>: File name, must be ASCII strings terminated with NULL, the max is 116 bytes
<v>: Version string, must be 4 ASCII strings like 0201, 0311, etc
<d>: Date string, must be 9 ASCII strings like 06JUN2010

Note:

1. Difference between action W and U

For W, it will try to write file to factory, file with same name must not exist in factory; otherwise, error will be reported.

For U, it will try to update file to factory, if file with same name exist in factory, this old file will be overwritten.

Examples:

We can use the following steps to test AT*MRD_CDF write command.

1. Write a file to factory

Write UDP.nvm to factory, with version “0001” and time stamp 2011.1.25

AT*MRD_CDF=W,UDP.nvm,0001,25JAN2011

OK

2. Query if file exist in RD, and file version

AT*MRD_CDF=Q,UDP.nvm

OK

exist

3. Update file to RD

UE always overwrites exist file.

AT*MRD_CDF=U,UDP.nvm,0001,26JAN2011

OK

4. Delete file in RD

AT*MRD_CDF=D,UDP.nvm

1

OK

3.11.2 AT*MRD_SN

Description

This is a generic AT command for writing SN (serial number) to factory. This command can only be used in production mode (send AT*PROD=1 will enter production mode).

Syntax

Command	Possible responses
*MRD_SN=<a>,[<v>,<d>,<s>]	If <a>=W OK - if no error happens +CME ERROR: <err> - if UE is not in production mode - if SN already exist in factory - if any parameters are not right

	<ul style="list-style-type: none"> - if error when write factory <p>if <a>=D OK</p> <ul style="list-style-type: none"> - if no error in deleting - if SN does not exist (*CME ERROR: Missing SN) <p>If <a>=R OK</p> <ul style="list-style-type: none"> - if no error in read (*MRD_SN: <v>, <d>, <s>) - if SN does not exist (*CME ERROR: Missing SN)
*MRD_SN=?	*MRD_SN=<a>,[<v>,<d>,<s>]

Defined values

<a>:

W: write SN to factory

D: delete SN from factory

R: read SN from factory

<v>: Version string, must be 4 ASCII strings like 0201, 0311, etc

<d>: Date string, must be 9 ASCII strings like 06JUN2010

<s>: The ASCII strings of SN, must terminated with NULL, the max is 32 bytes

Example:

1. Write a SN to factory

AT*MRD_SN=W,0101,12NOV2010,SN-Q1234567890
OK

2. Read SN from factory

AT*MRD_SN=R
*MRD_SN:0101,Tue Jun 19 00:00:00 2012,SN-Q1234567890
OK

3. Delete SN from factory

AT*MRD_SN=D
OK

3.11.3 AT*MRD_IMEI

Description

This is a generic AT command for writing IMEI to factory. This command can only be used in production mode (send AT*PROD=1 will enter production mode).

Syntax

Command	Possible responses
*MRD_IMEI=<a>[,<v>,<d>,<s>,<n>]	<p>If <a>=W OK</p> <ul style="list-style-type: none"> - if no error happens <p>+CME ERROR: <err></p> <ul style="list-style-type: none"> - if UE is not in production mode - if IMEI already exist in factory - if any parameters are not right - if error when write factory

	if <a>=D OK <ul style="list-style-type: none"> - if no error in deleting (1) - if IMEI does not exist (2) If <a>=R OK <ul style="list-style-type: none"> - if no error happens - if file does not exist (MRDFileRead error)
MRD_IMEI?	OK <ul style="list-style-type: none"> - if IMEI exists (MRD_IMEI: <s>) - if IMEI does not exist (NULL)
*MRD_IMEI=?	*MRD_IMEI=<a>[,<v>,<d>,<s>,<n>]

Defined values

<a>:

W: write IMEI to factory

D: delete IMEI from factory

R: read IMEI from factory

<v>: Version string, must be 4 ASCII strings like 0201, 0311, etc

<d>: Date string, must be 9 ASCII strings like 06JUN2010

<s>: The ASCII strings of IMEI, must be 14 or 15 or 16 digits, must terminated with NULL

<n>: index for DSDS IMEIs, 0: IMEI1; 1: IMEI2

Example:

1. Write IMEI1 to factory

AT*MRD_IMEI=W,0101,12NOV2010,01234567890123,0
OK

2. Write IMEI2 to factory

AT*MRD_IMEI=W,0101,19JUN2012,01234567890123,1
OK

3. Read IMEI1 from factory

AT*MRD_IMEI=R,0
*MRD_IMEI:0101,Tue Jun 19 00:00:00 2012,01234567890123
OK

4. Read IMEI2 from factory

AT*MRD_IMEI=R,1
*MRD_IMEI:0101,Tue Jun 19 00:00:00 2012,01234567890123
OK

5. Delete IMEI1 from factory

AT*MRD_IMEI=D,0
OK

6. Delete IMEI2 from factory

AT*MRD_IMEI=D,1
OK

3.11.4 AT*MRD_MEPE

Description

This is a generic AT command for writing MEP to factory. This command can only be used in production mode (send AT*PROD=1 will enter production mode).

Syntax

Command	Possible responses
*MRD_MEPE=<a>[,<v>,<d>,<cat>,<id>,<s1>[,<s2>[,<s3>,<s4>[,<s5>,<s6>,<s7>[,<s8>,<s9>,<n>]]]]]	<p>If <a>=W OK – if no error happens +CME ERROR: <err> – if UE is not in production mode – if any parameters are not right – if error when write factory</p> <p>if <a>=D OK – if no error in deleting +CME ERROR: <err> – if file does not exist</p> <p><a> = Q *MRD_MEPE: <v>, <d> – if MEP exist in factory +CME ERROR: <err> – if MEP does not exist</p>
*MRD_MEPE=?	*MRD_MEPE=<a>[,<v>,<d>,<cat>,<s1>[,<s2>[,<s3>,<s4>[,<s5>,<s6>,<s7>[,<s8>,<s9>,<n>]]]]]

Defined values

<a>:

W: write MEP to factory

D: delete MEP from factory

Q: query MEP from factory

<v>: Version string, must be 4 ASCII strings like 0201, 0311, etc

<d>: Date string, must be 9 ASCII strings like 06JUN2010

<n>: index for DS/DS MEPS, 0: MEP for SIM1; 1: MEP for SIM2

<cat>: update domain, can be following values:

"PN": network personalization

"PU": network subnet personalization

"PP": service provider personalization

"PC": corporate personalization

"PS": SIM/USIM personalization

"PSW": all the password

"CP": common part, field are not included in above categories

"RAW": raw data, the whole MEP.bin generated by PC tools

<idx>: index inside each cat. For each cat, there are 100 entries. So the range of value is from 0 to 99.

In each categories, parameter <s1>~<s9> may have different means, e.g.

<cat>: "PN"

AT*MRD_MEPE=<a>,<v>,<d>,<cat>,<mcc1>,<mnc1>,<act1>,<mcc2>,<mnc2>,<act2>,<mcc3>,<mnc3>,<act3>

<mccX>: hexadecimal format, MCC value, maximum length 3

<mncX>: hexadecimal format, MNC value, maximum length 3

<actX>: hexadecimal format, access technology, maximum length 4
 0x80: GSM
 0x8000: UTRAN

<cat>: "PU"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<network_subset>
 <network_subset>: hexadecimal format, Network Subset Code, maximum length 2

<cat>: "PP"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<service_provider>
 <service_provider>: hexadecimal format, service provider code, maximum length 2

<cat>: "PC"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<corporate>
 <corporate>: corporate code, maximum length 2

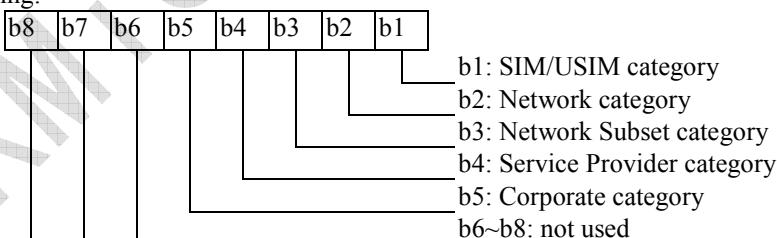
<cat>: "PS"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<imsi>
 <imsi>: string type, IMSI, maximum length 15

<cat>: "PSW"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<nck>,<nsck>,<spck>,<cck>,<pck>,<unlockpsw>,<trail_limit>
 <nck>: the ASCII strings of 16 characters representing NCK (network control key)
 <nsck>: the ASCII strings of 16 characters representing NSCK (network subset control key)
 <spck>: the ASCII strings of 16 characters representing SPCK (service provider control key)
 <cck>: the ASCII strings of 16 characters representing CCK (corporate control key)
 <pck>: the ASCII strings of 16 characters representing PCK (SIM lock control key)
 <unlockpsw>: the ASCII strings of 16 characters representing the MEP unlock password
 <trail_limit>: the ASCII strings representing the trial repeat limit

<cat>: "CP"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<si_enabled>,<si_activated>

<si_enabled>: hexadecimal format, default enabled code
 <si_activated>: hexadecimal format, default activated code
 These two fields are managed as bit wise
 0: not activate or disable
 1: activate or enable

Coding:



<cat>: "RAW"
 AT*MRD_MEP=<a>,<v>,<d>,<cat>,<data>
 <data>: hexadecimal format, binary generated by PC tools

Command example:

1. Write PN codes to RD for SIM1

The three PLMNs are China Mobile 2G (46000, 80), China Mobile 3G (46007, 8000), AT&T 2G

3.11.5 AT*MRD_AUTH

Description

This is a generic AT command for PC tools to get authorization from the UE to add, modify or remove the entries in MRD. It only can be used in production mode.

Note: This AT command is not released.

Syntax

Command	Possible responses
*MRD_AUTH	*MRD_AUTH=<c> +CME ERROR: <err> <ul style="list-style-type: none"> - if target did not boot in production mode
*MRD_AUTH=<r>,<pke>,<sm>	OK <ul style="list-style-type: none"> - if user was properly authorized and no error occurred +CME ERROR: <err> <ul style="list-style-type: none"> - if target failed to authorize the user - if target did not receive all expected parameters
*MRD_AUTH?	*MRD_AUTH="authorized" <ul style="list-style-type: none"> - if user was previously authorized *MRD_AUTH="not authorized" <ul style="list-style-type: none"> - if user was not previously authorized

Defined values

Defined values:
 <c> is a 128 bit (hexadecimal character format) challenge sent by the UE to the PC tool for signing by PKCS1v1.5 digital signature.

`<r>` is the 1024 bit (hexadecimal character format) response expected by UE from the PC tool after the challenge. The response is expected within 5 seconds of the challenge, otherwise the target aborts due to timeout; it is the same format as `<pke>` and `<sm>` (e.g. 32 words of 32 bit, LSW first, in each word, MSB first).

`<pke>` is the 1024 bit (hexadecimal character format) RSA public key exponent used to authorize the user/tool; it is in the format of the TIM descriptor (e.g. 32 words of 32 bit, LSW first, in each word MSB first)

<sm> is the 1024 bit (hexadecimal character format) RSA system modulus used to authorize the user/tool; it is in the format of the TIM descriptor (e.g. 32 words of 32 bit, LSW first, in each word, MSB first).

Example:

```
172d664a19a950fc5fbe20ff966020db0a0272f5fa8df871694df770d8250c6a6e19ec9107badbcb68f  
2bf451225efa98de295feb1d992a0edf3744669645aeb7c1a2fd65ee2bae54a7147f6c94d39d88b9c8  
955bde9acb8ab213f8a209fb931b021238fdc1458fc8af5458555b00cf044d  
OK
```

3. PC tool query current authorization status

AT*MRD_AUTH?

*MRD_AUTH: authorized

OK

3.11.6 AT*MRD_DUMP

Description

This is a generic AT command for dumping MRD image. It only can be used in production mode and in authorized state.

Note: This AT command is not released.

Syntax

Command	Possible responses
*MRD_DUMP=<partition>,<path>	OK <ul style="list-style-type: none">- if user was properly authorized and no error occurred +CME ERROR: <err> <ul style="list-style-type: none">- if target is not in authorized state- if target dump image failed
*MRD_DUMP?	*MRD_DUMP: <partition>,<path>

Defined values

<partition> MRD partition number

0: primary partition

1: backup partition (if support MRD BACKUP)

<path> file path in UE's file system

Example:

1. Dump primary partition

AT*MRD_DUMP=0, "/tmp/mrd.bin"

OK

2. Dump backup partition

AT*MRD_DUMP=1, "/tmp/mrd_backup.bin"

OK

3.11.7 AT*MRD_ITEM

Description

This is a generic AT command for writing CID/MEID/BSN/QR/HC /MMI_FLAG to factory (factory a). This command can only be used in production mode(send AT*PROD=1 will enter production mode).

Syntax

Command	Possible responses
*MRD_ITEM=<a>,<t>[<v>,<d>,<s>]	<p>If <a>=W OK</p> <ul style="list-style-type: none"> - if no error happens <p>+CME ERROR: <err></p> <ul style="list-style-type: none"> - if UE is not in production mode - if item to be written already exist in factory - if any parameters are not right - if error when writing factory <p>if <a>=D OK</p> <ul style="list-style-type: none"> - if no error in deleting (1) - if file does not exist (2) <p>+CME ERROR: <err></p> <ul style="list-style-type: none"> - if any parameters are not right <p>If <a>=R OK</p> <ul style="list-style-type: none"> - if no error happens - if file does not exist (MRDFileRead error) <p>+CME ERROR: <err></p> <ul style="list-style-type: none"> - if any parameters are not right
*MRD_ITEM=?	*MRD_ITEM=<a>,<t>[<v>,<d>,<s>]

Defined values

<a>: string type, operation

 W: write item(CID, MEID, etc) to factory

 D: delete item(CID, MEID, etc) from factory

 R: read item(CID, MEID, etc) from factory

<t>: string type, type of item

 “CID”

 “MEID”

 “BSN”

 “QR”

 “HC”

 “MMI_FLAG”

<v>: string type

 Version string, must be 4 ASCII strings like 0201, 0311, etc

<d>: string type

 Date string, must be 9 ASCII strings like 06JUN2010

<s>: string type

 The ASCII strings of item data, must terminated with NULL

Example:

1. Write CID to factory

AT*MRD_ITEM=W,CID,0101,12NOV2010,0123456789abc

OK

3. Read CID from factory

AT*MRD_ITEM=R,CID

*MRD_ITEM:"CID",101,"Fri Nov 12 00:00:00 2010","0123456789abc"

OK

4. Delete CID from factory

AT*MRD_ITEM=D,CID
"1"
OK

3.11.8 AT*CLCK

Description

This AT command is used to disable/unblock/query a specified MEP category.

Syntax

Command	Possible responses
*CLCK=<fac>,<mode>[,<passwork>]	If <mode>=2 *CLCK: <status> OK/+CME ERROR: <err> If <mode>=0,1 OK/+CME ERROR: <err>
*CLCK=?	*CLCK: ("PS","PN","PU","PP","PC"), (0-2), <password> OK

Defined values

<fac>:

"PS": SIM MEP category
"PN": NETWORK MEP category
"PU": Sub network MEP category
"PP": Service Provider category
"PC": Corporate MEP category

<mode>:

0: disable

1: unblock

2: query status

<password>: facility password

<status>

0: Lock is enabled and activated

1: Lock is enabled and de-activated

2: Lock is disabled

3: Lock is blocked since wrong key entry exceeded retry counter

4: Lock state was not read from data base yet

5: MEP feature is not supported

Command example:

```
AT+CLCK="PN",2 // query "PN" state: 0, not activate
+CLCK: 0
OK
AT+CLCK="PN",2 // query "PN" state with *CLCK: 1, deactivate
*CLCK: 1
OK
AT+CLCK="PN",1 // lock(activate) "PN"
OK
+CPIN: PH-NET PIN // indication of CPIN state change
AT+CPIN? // current CPIN state PH-NET PIN, need NCK to unlock
+CPIN: PH-NET PIN
OK
AT+CLCK="PN",0,"2222" // enter incorrect NCK for 5 times
```

```

+CME ERROR: 16
AT+CLCK="PN",0,"2222" // enter incorrect NCK for 5 times
+CME ERROR: 16
AT+CLCK="PN",0,"2222" // enter incorrect NCK for 5 times
+CME ERROR: 16
AT+CLCK="PN",0,"2222" // enter incorrect NCK for 5 times
+CME ERROR: 16
AT+CLCK="PN",0,"2222" // enter incorrect NCK for 5 times
+CME ERROR: 100
+CPIN: PH-CORP PUK // indication
AT+CPIN?
+CPIN: PH-CORP PUK // CPIN state: PH-CORP PUK (bug? should be PH-NET PUK)
OK
AT*CLCK="PN",2 // query "PN" state: 3, blocked
*CLCK: 3
OK
AT+CLCK="PN",2 // query "PN" state: 1, activate
+CLCK: 1
OK
AT*CLCK="PN",1,"666666" // unblock "PN"
OK
+CPIN: PH-NET PIN // indication
AT*CLCK="PN",2 // "PN" state: 0, activate
*CLCK: 0
OK
AT+CLCK="PN",0,"111111" // unlock "PN"
OK
+CPIN: READY // indication
AT+CPIN? // CPIN state: READY
+CPIN: READY
OK

```

3.11.9 AT*MEPCG

Description

This AT command is used to read the MEP codes for a specified category.

Syntax

Command	Possible responses
*MEPCG=<fac>	*MEPCG: <val> OK/+CME ERROR: <err>
*MEPCG=?	*MEPCG: ("PS","PN","PU","PP","PC")

Defined values

<fac> MEP category:
 "PS": SIM MEP category
 "PN": NETWORK MEP category
 "PU": Sub network MEP category
 "PP": Service Provider category
 "PC": Corporate MEP category

<val> value of MEP category:
 "PS": IMSI
 "PN": MCC+MNC
 "PU": network subnet code

"PP": service provide ID
"PC": corporate ID

Command example:

1. Read PS codes from RD

If the IMSI is 460006531387203, a China Mobile SIM card

AT*MEPCG="PS"

*MEPCG: 460006531387203

OK

2. Read PN codes from RD

If the three PLMNs are China Mobile 2G (46000, 80), China Mobile 3G (46007, 8000), AT&T 2G (310410, 80)

AT*MEPCG="PN"

*MEPCG:46000, 46007, 310410

OK

3. Read PU codes from RD

If the Network Subset is 0x12

AT*MEPCG="PU"

*MEPCG:18

OK

4. Read PP codes from RD

If the Service Provide codes is 0x34

AT*MEPCG="PP"

*MEPCG:52

OK

5. Read PC codes to RD

If the Corporate codes is 0x56

AT*MEPCG="PC"

*MEPCG:86

OK

3.11.10 AT* CALINFO

Description

This is a generic AT command for reading and writing calibration info.

Syntax

Command	Possible responses
*CALINFO=<operation>[,<type>,<value>]	If <operation>=W OK <ul style="list-style-type: none">- if no error happens+CME ERROR: <err>- if any parameters are not right- if error when write calibration info If <operation>=R OK <ul style="list-style-type: none">- if no error happens+CME ERROR: <err>

	<ul style="list-style-type: none"> - if any parameters are not right - if error when write calibration info if <a>=D OK <ul style="list-style-type: none"> - if no error in deleting +CME ERROR: <err> <ul style="list-style-type: none"> - if error when deleting PL_Cal_Info.nvm if <a>=L OK <ul style="list-style-type: none"> - if no error in listing
*MRD_CDF=?	*CALINFO=<operation>[,<type>,<value>]

Defined values

<operation>:

W: write calibration info to PL_Cal_Info.nvm

R: read calibration info from PL_Cal_Info.nvm

D: delete PL_Cal_Info.nvm

L: list all the calibration info

< type >: Version string, must be the specified calibration type defined in code.

< value >: String of calibration info written to nvm.

Note:

If write calibration info to nvm, this command can only work either after sending AT*NVMFLUSH or the system flush the flash when entering D2.

Examples:

We can use the following steps to test AT* CALINFO write command.

1. Write calibration info of specified type to PL_Cal_Info.nvm

AT*CALINFO=W,GsmCal,1234567890

*CALINFO: GsmCal,1234567890

OK

2. Read calibration info of specified type from PL_Cal_Info.nvm

AT*CALINFO=R,GsmCal

*CALINFO: GsmCal,1234567890

OK

3. Delete PL_Cal_Info.nvm

AT*CALINFO=D

*CALINFO: OK

OK

4. List all calibration info in PL_Cal_Info.nvm

AT*CALINFO=L //Info is printed to AP com

list record[0] SnWrite=

list record[1] LteCal=

list record[2] WcdmaCal=

list record[3] TdscdmaCal=

list record[4] CdmaCal=

list record[5] GsmCal=

list record[6] LteTest=

list record[7] WcdmaTest=
list record[8] TdscdmaTest=
list record[9] GsmTest=
list record[10] CdmaTest=
list record[11] FunctionTest=
list record[12] AntennaTest=
list record[13] GoldenBoard=
list record[14] ImeiWrite=
list record[15] CustumDef1=
list record[16] CustumDef2=
list record[17] CustumDef3=
list record[18] GsmGolden=
list record[19] WcdmaGolden1=
list record[20] WcdmaGolden2=
list record[21] TdscdmaGolden=
list record[22] CdmaGolden=
list record[23] LteGolden1=
list record[24] LteGolden2=
list record[25] LteGolden3=
list record[26] LteGolden4=
list record[27] LteGolden5=
list record[28] LteGolden6=
list record[29] LteGolden7=
list record[30] LteGolden8=
list record[31] CurrentTest=
list record[32] Reserve2=
list record[33] Reserve3=
list record[34] Reserve4=

3.12 Engineering Mode related Commands

3.12.1 AT+EEMOPT

Description

Set/Get GSM/UMTS Engineering Mode indicator

Syntax

Command	Possible responses
+EEMOPT=<option>[,<value>]	OK/+CME ERROR: <err>
+ EEMOPT?	+EEMOPT: <option>[,<value>]

	OK/+CME ERROR: <err>
+ EEMOPT=?	List of options

Defined values

<option>:

0: Turn off indicator. This is the default mode after ME boot-up.

1: Set to query mode. In this mode, no network parameter indication is reported.

(NOTE: but user can query the network parameter by +EEMGINFO)

2: Set to periodic mode. In this mode, the GSM Engineering Mode's information will be reported in specific time interval, which specified by <value> second.

(NOTE: refer to indicator +EEMGINFOBASIC, +EEMGINFOsvc, +EEMGINFOps, +EEMGINFONC)

3: Snapshot mode. The old <value> will stored as snapshot.

4: Restore to snapshot <value>.

<value>:

Time interval in seconds for reporting indications. Only valid when option is set to 2.

3.12.2 AT+EEMGINFO

Description

Query GSM/UMTS information in Engineering Mode.

Syntax

Command	Possible responses
+ EEMGINFO?	+EEMGINFO:<state>,<nw_type> OK/+CME ERROR: <err>
+ EEMGINFO = <type> Note: <type>: 0: not force, may include Ncell info 1: force to decode system info to get Ncell info This option is only applied under oneshot mode (AT+EEMOPT=0)	OK/+CME ERROR: <err>
+ EEMGINFO =?	+EEMGINFO:(0-1) OK

Defined values

<state>:

0: ME in Idle mode

1: ME in Dedicated mode

2: ME in PS PTM mode

3: ME in invalid mode

<nw_type>:

0: GSM

- 1: UMTS
2: LTE

3.12.3 Unsolicited result code: +EEMLTESVC

Description

Indication of serving-cell information in LTE Engineering Mode

Syntax

+EEMLTESVC:< p1>,< p2>,< p3>,< p4>,< p5>,< p6>,< p7>,< p8>,< p9>,< p10>,< p11>,< p12>,< p13>,< p14>,< p15>,< p16>,< p17>,< p18>,< p19>,< p20>,< p21>,< p22>,< p23>,< p24>,< p25>,< p26>,< p27>,< p28>,< p29>,< p30>,< p31>,< p32>,< p33>,< p34>,< p35>,< p36>,< p37>,< p38>,< p39>,< p40>,< p41>,< p42>,< p43>,< p44>,< p45>,< p46>,< p47>,< p48>,< p49>,< p50>,< p51>.

All parameters are interger type:

Defined Values:

<p1> mcc
<p2> lenOfMnc
<p3> mnc
<p4> tac
<p5> phyCellId
<p6> dlEuArfcn
<p7> ulEuArfcn
<p8> band
<p9> dlBandwidth
<p10> rsrp
<p11> rsrq
<p12> sinr
<p13> errcModeState
<p14> emmState
<p15> serviceState
<p16> IsSingleEmmRejectCause
<p17> EMMRejectCause
<p18> mmeGroupId
<p19> mmeCode
<p20> mTmsi
<p21> sCellPresent
<p22> cellId
<p23> subFrameAssignType
<p24> specialSubframePatterns
<p25> transMode
<p26> mainRsrp

<p27> diversityRsrp
<p28> mainRsrq
<p29> diversityRsrq
<p30> rssi
<p31> cqi
<p32> pathLoss
<p33> tb0DlTpt
<p34> tb1DlTpt
<p35> tb0DlPeakTpt
<p36> tb1DlPeakTpt
<p37> tb0UlPeakTpt
<p38> tb1UlPeakTpt
<p39> dlThroughPut
<p40> dlPeakThroughPut
<p41> averDlPRB
<p42> averCQITb0
<p43> averCQITb1
<p44> rankIndex
<p45> grantTotal
<p46> ulThroughPut
<p47> ulPeakThroughPut
<p48> currPuschTxPower
<p49> averUlPRB
<p50> dlBler
<p51> ulBler

3.12.4 Unsolicited result code: +EEMLTEINTRA

Description

Indication of Intra freq information in LTE Engineering Mode.

Syntax

+EEMLTEINTRA: <p1>,<p2>,<p3>,<p4>,<p5>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTRAFREQ
<p2> phyCellId
<p3> euArfcn
<p4> rsrp
<p5> rsrq

3.12.5 Unsolicited result code: +EEMLTEINTER

Description

Indication of Inter freq information in LTE Engineering Mode.

Syntax

+EEMLTEINTER: <p1>,<p2>,<p3>,<p4>,<p5>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTERFREQ

<p2> phyCellId

<p3> euArfcn

<p4> rsrp

<p5> rsrq

3.12.6 Unsolicited result code: +EEMLTEINTERRAT

Description

Indication of inter RAT information in LTE Engineering Mode.

Syntax

+EEMLTEINTERRAT: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>[,<p10>]

All parameters are interger type:

Defined Values:

<p1> networktype (0:GSM,1:UMTS)

<p2> number of INTERRAT.

<p3> mcc

<p4> mnc

<p5> lac

<p6> ci

<p7> arfcn(GSM)/uarfcn(UMTS)

<p8> bsic(GSM) / psc_cellParameterId(UMTS)

<p9> rssi(GSM) / rscp(UMTS)

<p10> cpichEcN0(UMTS)

3.12.7 Unsolicited result code: +EEMUMTSSVC

Description

Indication of serving-cell information in UMTS Engineering Mode

Syntax

1. Non TD mode:

+EEMUMTSSVC:<p1>,<p2>,<p3>,<p4>,[<p5>,<p6>,...>,<p10>],[<p11>,<p12>,...,<p28>],[<p29>,<p30>,...,<p57>]

All parameters are interger type

Define values:

<p1>: Engineer Mode

<p2> sCMeasPresent

<p3> sCParamPresent

<p4> ueOpStatusPresent

If **sCMeasPresent** is TRUE, the following 6 items will be printed.

<p5> cpichRSCP

<p6> ultraRssi

<p7> cpichEcN0

<p8> sQual

<p9> sRxLev

<p10> txPower

If **sCParamPresent** is TRUE, the following 18 items will be printed.

<p11> rac

<p12> nom

<p13> mcc

<p14> mnc

<p15> lac

<p16> ci

<p17> uraId

<p18> psc

<p19> arfcn

<p20> t3212

<p21> t3312

<p22> hcsUsed

<p23> attDetAllowed

<p24> csDrxCycleLen

<p25> psDrxCycleLen

<p26> utranDrxCycleLen

<p27> HSDPASupport

<p28> HSUPASupport

If **ueOpStatusPresent** is TRUE, the following 27 items will be printed.

<p29> rrcState

<p30> numLinks

<p31> srncId
<p32> sRnti
<p33> algPresent
<p34> cipherAlg
<p35> cipherOn
<p36> algPresent
<p37> cipherAlg
<p38> cipherOn
<p39> HSDPAActive
<p40> HSUPAActive
<p41> MccLastRegisteredNetwork
<p42> MncLastRegisteredNetwork
<p43> TMSI
<p44> PTMSI
<p45> IsSingleMmRejectCause
<p46> IsSingleGmmRejectCause
<p47> MMRejectCause
<p48> GMMRejectCause
<p49> mmState
<p50> gmmState
<p51> gprsReadyState
<p52> readyTimerValueInSecs
<p53> NumActivePDPContext

<p54> ULThroughput
<p55> DLThroughput

<p56> serviceStatus
<p57> pmmState

2. TD mode:

+EEMUMTSSVC:<p1>,<p2>,<p3>,<p4>,[<p5>,<p6>,<p7>,<p8>],[<p9>,<p10>,...,<p27>],[<p28>,<p29>,...,<p60>]

All parameters are interger type

Define values:

<p1>: Engineer Mode
<p2> sCMeasPresent
<p3> sCPParamPresent
<p4> ueOpStatusPresent

If **sCMeasPresent** is TRUE, the following 4 items will be printed.

<p5> pccpchRSCP

<p6> ultraRssi
<p7> sRxLev
<p8> txPower

If **sCParamPresent** is TRUE, the following 18 items will be printed.

<p9> rac
<p10> nom
<p11> mcc
<p12> lenOfMnc

<p13> mnc
<p14> lac
<p15> ci
<p16> uraId
<p17> cellParameterId
<p18> arfcn
<p19> t3212
<p20> t3312
<p21> hcsUsed
<p22> attDetAllowed
<p23> csDrxCycleLen
<p24> psDrxCycleLen
<p25> utranDrxCycleLen
<p26> HSDPASupport
<p27> HSUPASupport

If **ueOpStatusPresent** is TRUE, the following 27 items will be printed.

<p28> rrcState
<p29> numLinks
<p30> srncId
<p31> sRnti
<p32> algPresent
<p33> cipherAlg
<p34> cipherOn
<p35> algPresent
<p36> cipherAlg
<p37> cipherOn
<p38> HSDPAActive
<p39> HSUPAActive
<p40> MccLastRegisteredNetwork
<p41> MncLastRegisteredNetwork
<p42> TMSI
<p43> PTMSI

<p44> IsSingleMmRejectCause
<p45> IsSingleGmmRejectCause
<p46> MMRejectCause
<p47> GMMRejectCause
<p48> mmState
<p49> gmmState
<p50> gprsReadyState
<p51> readyTimerValueInSecs
<p52> NumActivePDPContext
<p53> ULThroughput
<p54> DLThroughput
<p55> serviceStatus
<p56> pmmState
<p57> LAUStatus
<p58> LAUCount
<p59> RAUStatus
<p60> RAUCount

3.12.8 Unsolicited result code: +EEMUMTSINTRA

Description

Indication of Intra freq information in UMTS Engineering Mode

Syntax

1. Non-TD mode

+ EEMUMTSINTRA:

<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTRAFREQ
<p2> cpichRSCP
<p3> ultraRssi
<p4> cpichEcN0
<p5> sQual
<p6> sRxLev
<p7> mcc
<p8> mnc
<p9> lac
<p10> ci
<p11> arfcn
<p12> psc

2. TD mode

+ EEMUMTSINTRA: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTRAFREQ

<p2> pccpchRSCP

<p3> utraRssi

<p4> sRxLev

<p5> mcc

<p6> mnc

<p7> lac

<p8> ci

<p9> arfcn

<p10> cellParameterId

3.12.9 Unsolicited result code: +EEMUMTSINTER

Description

Indication of inter freq information in UMTS Engineering Mode

Syntax

1. Non-TD mode

+EEMUMTSINTER:

<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTERFREQ

<p2> cpichRSCP

<p3> utraRssi

<p4> cpichEcN0

<p5> sQual

<p6> sRxLev

<p7> mcc

<p8> mnc

<p9> lac

<p10> ci

<p11> arfcn

<p12> psc

2. TD mode

+EEMUMTSINTER: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>

All parameters are interger type:

Defined Values:

<p1> index of ENGMODE INTERFREQ
<p2> pccpchRSCP
<p3> ultraRssi
<p4> sRxLev
<p5> mcc
<p6> mnc
<p7> lac
<p8> ci
<p9> arfcn
<p10> cellParameterId

3.12.10 Unsolicited result code: +EEMUMTSINTERRAT

Description

Indication of inter RAT information in UMTS Engineering Mode

Syntax

+EEMUMTSINTERRAT:

<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>

All parameters are integer type:

Defined Values:

<p1> index of ENGMODE INTERRAT
<p2> gsmRssi
<p3> rxLev
<p4> C1
<p5> C2
<p6> mcc
<p7> mnc
<p8> lac
<p9> ci
<p10> arfcn
<p11> bsic

3.12.11 Unsolicited result code: +EEMGINFOBASIC

Description

Indication of basic information in GSM Engineering Mode

Syntax

+EEMGINFOBASIC: <state>

Defined Values

<state>:

- 0: ME in Idle mode
- 1: ME in Dedicated mode
- 2: ME in PS PTM mode

3.12.12 Unsolicited result code: +EEMGINFOsvc

Description

Indication of serving-cell information in GSM Engineering Mode

Syntax

+EEMGINFOsvc: <mcc>, <mnc>, <lac>, <ci>, <nom>, <nco>, <bsic>, <C1>, <C2>, <TA>, <TxPwr>, <RxSig>, <RxSigFull>, <RxSigSub>, <RxQualFull>, <RxQualSub>, <ARFCN_tch>, <hopping_chnl>, <chnl_type>, <TS>, <PacketIdle>, <rac>, <arfcn>, <bs_pa_mfrms>, <C31>, <C32>, <t3212>, <t3312>, <pbcch_support>, <EDGE_support>, <ncc_permitted>, <rl_timeout>, <ho_count>, <ho_succ>, <chnl_access_count>, <chnl_access_succ_count>, <gsmBand>, <chanl_mode>

All parameters are interger type:

Defined Values:

- <mcc>: Mobile Country Code
- <mnc>: Mobile Network Code
- <lac>: Location Area Code
- <ci>: Cell Identifier
- <nom>: Network Operation Mode
- <nco>: Network Control Order
- <bsic>: Base Station Identity Code
- <C1>: C1 value
- <C2>: C2 value
- <TA>: Timing Advance
- <TxPwr>: Transmit Power
- <RxSig>: Receive level BCCH
- <RxSigFull>: Receive level for full set of TCH
- <RxSigSub>: Receive level for sub set of TCH
- <RxQualFull>: BER in DTX mode
- <RxQualSub>: BER in non-DTX mode
- <ARFCN_tch>: Traffic Channel ARFCN(Absolute Radio Frequency Channel)
- <hopping_chnl>: Channel is hopping
- <chnl_type>: Channel type

<TS>: Serving timeslot
<PacketIdle>: In packet idle mode
<rac>: Routing Area Code
<arfcn>: Absolute Radio Frequency Channel
<bs_pa_mfrms>: BS PA frames
<C31>: C31 value
<C32>: C32 value
<t3212>: timeout No. 3212
<t3312>: timeout No. 3312
<pbcch_support>: Support PBCCH
<EDGE_support>: Support EDGE
<ncc_permitted>: NCC permitted
<rl_timeout>: Radio link timeout
<ho_count>: Total hand-over count
<ho_succ>: Success hand-over count
<chnl_access_count>: Total channel access count
<chnl_access_succ_count>: Success channel access count
<gsmBand>: gsm band
<chanl_mode>: mode of dedicated channel

3.12.13 Unsolicited result code: +EEMGINFOPS

Description

Indication of PS information in GSM Engineering Mode

Syntax

+EEMGINFOPS: <PS_attached>, <attach_type>, <service_type>, <tx_power>, <c_value>, <ul_ts>, <dl_ts>, <ul_cs>, <dl_cs>, <ul_modulation>, <dl_modulation>, <gmsk_cv_bep>, <8psk_cv_bep>, <gmsk_mean_bep>, <8psk_mean_bep>, <EDGE_bep_period>, <single_gmm_rej_cause>, <pdp_active_num>, <mac_mode>, <network_control>, <network_mode>, <EDGE_slq_measurement_mode>, <edge_status>

All parameters are interger type:

Defined Values:

<PS_attached>: GPRS/EDGE attached
<attach_type>: Attach type
<service_type>: Service type
<tx_power>: Transmit power
<c_value>: C value
<ul_ts>: Uplink timeslot
<dl_ts>: Downlink timeslot
<ul_cs>: Uplink Coding Scheme
<dl_cs>: Downlink Coding Scheme

<ul_modulation>: Uplink modulation
<dl_modulation>: Downlink modulation
<gmsk_cv_bep>: GMSK CV BEP(Block Error Probability)
<8psk_cv_bep>: 8PSK CV BEP
<gmsk_mean_bep>: GMSK mean BEP
<8psk_mean_bep>: 8PSK mean BEP
<EDGE_bep_period>: EDGE BEP period
<single_gmm_rej_cause>: Is single GMM reject cause
<pdp_active_num>: Activated PDP number
<mac_mode>: MAC mode
<network_control>: Network control
<network_mode>: network mode
<EDGE_slq_measurement_mode>: EDGE SLQ measurement mode
<edge_status>: EDGE status

3.12.14 Unsolicited result code: +EEMGINFONC

Description

Indication of neighbour-cell information in GSM Engineering Mode

Syntax

+EEMGINFONC: <nc_num>, [<mcc>, <mnc>, <lac>, <rac>, <ci>, <rx_lv>, <bsic>, <C1>, <C2>, <arfcn>, <C31>, <C32>, [...]]

Defined Values

<nc_num>: Neighbor cell number
<mcc>: Mobile Country Code
<mnc>: Mobile Network Code
<lac>: Location Area Code
<rac>: Routing Area Code
<ci>: Cell Indentifier
<rx_lv>: Receive signal level
<bsic>: Base Station Identity Code
<C1>: C1 value
<C2>: C2 value
<arfcn>: Absolute Radio Frequency Channel
<C31>: C31 value
<C32>: C32 value

3.12.15 Unsolicited result code: +EEMGINBFTM

Description

To notify current network status which used for EFEM

Syntax

+EEMGINBFTM:
<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,<p15>,<p16>,<p17>,<p18>,<p19>

Defined Values

<p1>: Engineering Mode
<p2>: mcc
<p3>: mnc
<p4>: lac
<p5>: ci
<p6>: bsic
<p7>: C1
<p8>: C2
<p9>: Timing advance
<p10>: TxPowerLevel
<p11>: rxSigLevel
<p12>: rxSigLevelFull
<p13>: rxSigLevelSub
<p14>: rxQualityFull
<p15>: rxQualitySub
<p16>: arfcnTch
<p17>: hopping status
<p18>: channel type
<p19>: Server Timeslot

3.12.16 Unsolicited result code: +EEMGINFOGMM

Description

Indication of mobility management information in GSM Engineering Mode

Syntax

+EEMGINFOGMM:
<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,<p15>,<p16>,<p17>,<p18>,<p19>

All parameters are interger type

Defined Values

<p1>: MccLastRegisteredNetwork
<p2>: MncLastRegisteredNetwork

<p3>: TMSI
 <p4>: PTMSI
 <p5>: IsSingleMmRejectCause
 <p6>: MMRejectCause
 <p7>: currentBandMode
 <p8>: mmState
 <p9>: gmmState
 <p10>: gprsReadyStatus
 <p11>: readyTimerValueInSecs
 <p12>: serviceStatus
 <p13>: LAUStatus
 <p14>: LAUCount
 <p15>: RAUStatus
 <p16>: RAUCount

3.13 GPS related Commands

3.13.1 AT+LPNWUL

Description

This AT command is used to deliver measurements reports and/or status from A-GPS client to PS/NW.

Syntax

Command	Possible responses
+LPNWUL =[<msg_data>],<msg_data_len>, <count>,<bearer_type>, <ifinal>	+LPNWUL: <val> OK/+CME ERROR: <err>

Defined values

<msg_data>: max 1000 bytes length, string type values in HEX. ASN.1 payload, divided to 4 segments of 500 bytes. If msg_data is empty, it means msg_data is NULL, and msg_data_len should be set 0.

<msg_data_len>: length of ASN.1 payload.

<count>: index of the message

<bearer_type>: specifies the over-the-air message type (RRC or RRLP). If the value is 0, bearer type is RRC; 1 for RRLP.

<ifinal>: True if this is the last message on this session from the Location Manager, (to free MS/UE resources).

NOTE: ASN.1 payload is divided to 4 segments of 500 bytes. Here 1000 bytes <msg_data> are generated by expanding 500bytes with Hex format. <msg_data_len> is the length of ASN.1 payload, which size is not larger than 500bytes.

For example, for the Test Case “17.2.4.1_LCS MT-LR UE-based” of Control Plane 3G Conformance - 3GPP TS 34.123, one ASN.1 payload is 18bytes like {0xc8, 0xbc, 0xbc, 0xb4, 0xc1, 0x0c, 0xb0, 0x19, 0x78, 0xd8, 0x61, 0x00, 0x0c, 0x42, 0x85, 0x8e, 0x22, 0x18}. And this is last message on this session from the Location Manager.

AT CMD1: AT+LPNWUL=c8bc4c10cb01978d861000c42858e2218,18,0,0,1
RESPONSE1: +LPNWUL:0

AT CMD2: AT+LPNWUL=,18,1,0,1
RESPONSE2: +LPNWUL:0

AT CMD3: AT+LPNWUL=,18,2,0,1
RESPONSE3: +LPNWUL:0

AT CMD4: AT+LPNWUL=,18,3,0,1
RESPONSE4: +LPNWUL:0

From the response, <val> is 0, which means ASN.1 payload is delivered successfully.

3.13.2 AT+LPLOCVR

Description

This AT command is used to respond to the location verification indication.

Syntax

Command	Possible responses
+LPLOCVR=<taskid>, <invokeHandle>, <present>[,<verificationRsp>]	OK/+CME ERROR

Defined values

<taskid>: Application background task ID (It is copied from APEX interface), 0 as default value.

<invokeHandle>: This must correspond to a 'live' invokeHandle associated with an outgoing invoke. If a matching invoke handle is not found then this signal is not generated (It is copied from APEX interface).

<present>: True if Location notification response is present.

<verificationRsp>: Location notification response.

1: GRANTED

0: DENIED

NOTE: This AT command is used to respond to the location verification indication.

For example, location verification indication is granted, and < invokeHandle > is 0xffff8000.

AT CMD: AT+LPLOCVR=0,4294934528,1,1

RESPONSE: OK

3.13.3 Unsolicited result code: +LPLOC

Description

Indication that the location information of the mobile was requested.

Syntax

+LPNWDL:<p1>,<p2>,<p3>,<p4>,[<p5>,<p6>,[<p7>,[<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,[<p15>,<p16>,[<p17>,<p18>,<p19>,<p20>,[<p21>]]]]]

Defined Values

<p1>: Radio This must correspond to a 'live' invoke Handle associated with an outgoing invoke. If a matching invoke handle is not found then this signal is not generated
<p2>: LCS notification type
<p3>: LCS Location estimate type
<p4>: Indicated if deferred location type is present
<p5>: Deferred location type
<p6>: Indicated if LCS client external ID is present
<p7>: Indicates if address is present
<p8>: Address length, max is 20
<p9>: External Address
<p10>: Indicated if LCS client name is present
<p11>: Data coding scheme
<p12>: LCS client name length
<p13>: LCS client name
<p14>: Indicated if Format indicator is present
<p15>: format indicator
<p16>: Indicated if LCS requestor ID is present
<p17>: Data coding scheme
<p18>: LCS requestor ID length
<p19>: LCS requestor ID
<p20>: Indicated if Format indicator is present
<p21>: format indicator

3.13.4 Unsolicited result code: +LPNWDL

Description

An indication primitive from protocol stack to APPS, indicating of either RRC or RRLP positioning-related message from the network to the AGPS client running on the APPS.

Syntax

+LPNWDL:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>

Defined Values

<p1>: Radio bearer type
<p2>: data
<p3>: Size of data
<p4>: Session type info
<p5>: RRC state
<p6>: Ordinal number of the message

3.13.5 Unsolicited result code: +LPSTATE

Description

AGPS C-Plane indication primitive from protocol stack to APPS, indicating of RRC state change. It should be called by ABPS whenever the RRC state changes while a positioning session is active

Syntax

+LPSTATE:<p1>, <p2>

Defined Values

<p1>: Radio bearer type

<p2>: Current RRC state

3.13.6 Unsolicited result code: +LPMEAST

Description

Indication primitive from protocol stack to APPS, indicating of RAT termination (either of GSM or WCDMA)

Syntax

+LPMEAST:<p1>

Defined Values

<p1>: Radio bearer type

3.13.7 Unsolicited result code: +LPRESET

Description

This is an indication primitive from protocol stack to APPS, which is a test I/F message (TIM) requesting the UE to erase all the assistance data that may have been previously stored in the UE, prior to the execution of the test

Syntax

+LPRESET:<p1>

Defined Values

<p1>: Radio bearer type

3.13.8 AT*GPSTEST

Description

This proprietary AT command is used to do CSR and ASR GPS test. If property "ro.gps.chip.vendor" contains "CSR", it will load CSR GPS lib. Otherwise, it will use ASR GPS lib.

Syntax

Command	Possible responses
For CSR GPS *GPSTEST=<attr>,<p1>,<p2>	For CSR GPS *GPSTEST: <r0>,<r1>,<r2>
For ASR GPS AT*GPSTEST=<attr>, <p1>,	OK/+CME ERROR:<err> For ASR GPS

<p2>[,<mode>[, <svid>]]	*GPSTEST: <r0>,<r3> OK/+CME ERROR:<err>
*GPSTEST?	OK/+CME ERROR:<err>

Defined values

<attr>: 1 byte

0 – Operation

1 – Read

<p1>:1 byte

0 – deactivation when attr is 0, or read when attr is 1.

1 – activation. Only used when attr is 0.

2 – Read GPS UART communication status. Only used when attr is 0, and only for ASR GPS

<p2>:1 byte

0 – Multi channel. Or reading GPS UART communication status when p1 is 2.

1 – Single Channel

2 – GLONASS single channel. Only for ASR GPS

For ASR GPS test, when <attr> is 0, <p1> is 1, <p2> is 1, below paramters is needed and the <mode> value will be saved to use when do Read single channel test(<attr> is 1, <p1> is 0, <p2> is 1).

<mode>:1 byte, default value is 4.

1 – Integrity test 1,all tracking channels track one SV at one signal level

2 – Integrity test 2, all tracking channels track one SV at two signal level

3 – Week acquisition test

4 – CW test for GPS

5 – Live fix test

6 – Live fix test for AGPS

<svid>:1 byte, [1-32], default value is 1.

For CSR GPS:

<r0>:1 byte

0 – Deactivation or activation is successful

1 – Read

<r1>: unsigned long (4 bytes).

Input frequency value.

<r2>:2 bytes

This value is 10 times about original CN value in dB

For example, if r2 is 388, the CN value is 38.8.

For ASR GPS:

<r0>:1 byte

0 – Deactivation, activation or Read is successful

<r3>: string type or unsigned int.

(a)String type. Used when activating or deactivating test mode. “OK” stands for successful case, “TIMEOUT” for operation is on-going or timeout, “NOSIG” for not detecting signal, “ERROR” for unknown error.

(b)unsigned int(4 bytes). Used when activating or deactivating test mode.

Test scenarios:

(A) GPS test mode

Command	attr	p1	p2	<mode>(only)	<svid>(only)

				for ASR GPS)	for ASR GPS)
AT*GPST EST	0 (Operation)	0 (Deactivation)	0: -	-	-
		1	1: -	-	-
	1 (Activation)	0: Not supported	-	-	-
		1: (Act Single Channel)	[1-6]	[1-32]	
	1 (Read)	0 (Read)	0: Not supported	-	-
			1: (Read CN/Single Channel)	Use the value saved by activation command.	-

(B) GLONASS test (only for ASR GPS)

Command	attr	p1	p2
AT*GPST EST	0 (Operation)	0 (Deactivation)	2
		1 (Activation)	2 (Act Single Channel)
	1 (Read)	0 (Read)	2 (Read CN/Single Channel)

(C) Read GPS UART communication status (Only for ASR GPS)

Command	attr	p1	p2
AT*GPST EST	0 (Operation)	2 (Read)	0 (Read UART communication status)

GPS Response message

(1) CSR GPS

r0	r1	r2	description
0	-	-	Deactivation or activation is successful
1	X	X	Read frequency and CN from Single Channel

(2) ASR GPS

r0	r3	description
0	-	Deactivation or activation is successful
0	X	Read test mode and CN from Single Channel, Or status in string format

Note: The example when use this AT command is as following:

For CSR GPS:

1. operation deactivation single channel - Turn GPS Off

AT*GPSTEST =0,0,1

*GPSTEST:0

OK

2. operation activation single channel - Turn GPS On

AT*GPSTEST=0,1,1

*GPSTEST:0

OK

3. read single channel - Read the test result

AT*GPSTEST =1,0,1

*GPSTEST:1,1574994073,388

OK

For ASR GPS:

1. operation deactivation single channel - Turn GPS Off

AT*GPSTEST =0,0,1

*GPSTEST:0,OK

OK

2. operation activation single channel - Turn GPS On and set integrity test mode and SV ID.

AT*GPSTEST=0,1,1,1,3 //Enter Integrity test mode 1 and target SV id is 3

*GPSTEST:0,OK

OK

3. read single channel - Read the test result.

AT*GPSTEST=1,0,1

*GPSTEST:0,44

OK

3.14 WIFI Commands

3.14.1 AT*WIFICTRL

Description

ASR extended AT command to control WIFI scan function

Syntax

Command	Possible responses
AT*WIFICTRL=<option> Note: <option>: integer type. 0 – stop to scan wifi hotspot 1 – start to scan wifi hotspot	OK/+CME ERROR: <err>
AT*WIFICTRL?	*WIFICTRL: <option> OK/+CME ERROR: <err>
AT*WIFICTRL =?	*WIFICTRL: (0-1)

3.14.2 Unsolicited result code: *WIFICELLINFO

Description

ASR extended AT command to indicate the searched wifi hotspot information

Syntax

* WIFICELLINFO: <mac addr>, <rssi>, <channel_num>

Defined Values

< mac addr >: string type, MAC address

< rssi >: integer type, receive signal, in dBm

< channel_num >: integer type

3.15 Other Commands

3.15.1 AT+VDUMP

Description

Set control log level. Store the log level to global variable. It can control log print to android log buffer and to file, log level less than the control log level will be print,

Syntax

Command	Possible responses
+VDUMP=<loglevel> Note: <loglevel> the log level less than loglevel will be displayed. 0: LOG_SILENT 1: LOG_EMERG 2: LOG_ALERT 3: LOG_CRIT 4: LOG_ERR 5: LOG_WARNING 6: LOG_NOTICE 7: LOG_INFO 8: LOG_DEBUG	OK/+CME ERROR: <err>
+VDUMP?	+VDUMP: <loglevel> OK
+VDUMP=?	+VDUMP: (0-8) OK

3.15.2 AT*POWERIND

Description

This proprietary AT command is used to notify modem that AP sleep status. When AP goes to sleep, modem will not send indication to AP except MT call and SMS incoming.

Syntax

Command	Possible responses
*POWERIND=<n>	OK/+CME ERROR: <err>
*POWERIND =?	*POWERIND:(0-1) OK

Defined values

<n>:

0 – AP is awake

1 – AP is sleep

Note: The example when use this AT command is as following:

1. Send a command that will provide indications, after that AP will receive many indications, e.g. enable engineering mode indication: AT+EEMOPT=2,1
2. Send AT*POWERIND=1 to CP, then CP will not send indications to AP except MT call and

MT SMS;
3. Send AT*POWERIND=0 to CP, AP can receive indications again.

3.15.3 AT*SYSSLEEP

Description

This proprietary AT command is used to make device enter suspend state.

Syntax

Command	Possible responses
*SYSSLEEP	OK/+CME ERROR:<err>

3.15.4 AT+LTEPOWER

Description

This proprietary AT command is used to control LTE Tx/Rx power.

Syntax

Command	Possible responses
+LTEPOWER =<option>,<channel>,<power>	OK/+CME ERROR:<err>

Defined values

<option>:

Operations:

0 – Operation (Tx On /Off)

<channel>: map of number and frequency.

1: 18300

2: 18900

3: 19500

4: 20175

5: 20525

6: 20700

7: 21100

8: 21625

17: 23790

20: 24300

38: 38000

40: 39150

<power>:

compared to 2G/3G. it defined below.

'0' : Max Power (23dBm)

'1' : 10dBm

In case of Tx Off, whatever in Band case to request to turn Tx on, channel and power should be set 01 and 9 respectively.

1. In case of requesting to output Tx Power as 10dBm in LTE Band 4.
AT+LTEPOWER=0,04,1 // request to turn Tx On as 10dBm in Band 4
2. In case of requesting to turn Tx on as 10dBm in LTE Band 17:
AT+LTEPOWER=0,17,1 // request to turn Tx On as 10dBm in LTE Band 17
3. In case of requesting to turn LTE Tx Off
AT+LTEPOWER=0,01,9 // request to turn Tx Off

3.15.5 AT*GSMTR

Description

This proprietary AT command is used to set Tx or Rx on GSM for radio testing.

Syntax

Command	Possible responses
*GSMTR=<op>[,<band>,<arfcn>,<afcDac>[,<txRampScale>,<rxGainCode>]]	*GSMTR: <rssiDbmValue> OK/+CME ERROR:<err>
*GSMTR=?	*GSMTR=<op>[,<band>,<arfcn>,<afcDac>[,<txRampScale>,<rxGainCode>]] OK

Defined values

<op>:

Operations:

- 0 – start GSM Tx
- 1 – start GSM Rx
- 2 – start GSM Tx and RX
- 3 – stop GSM Tx or Rx

<band>:

GSM band mode:

- 1 – PGSM 900 (standard or primary)
- 2 – DCS GSM 1800
- 4 – PCS GSM 1900
- 8 – EGSM 900 (extended)
- 16 – GSM 450
- 32 – GSM 480
- 64 – GSM 850

<arfcn>:

Absolute Radio Frequency Channel Number:

- For PGSM 900, range: (1-124)
- For DCS1800, range: (512-885)
- For PCS1900, range: (512-810)
- For EGSM 900, range: (0-124) and (975-1023)
- For GSM 450, range: (259-293)
- For GSM 480, range: (306-340)
- For GSM850, range: (128-251)

<afcDac>:

AFC DAC:

Range: (5000-32000)

<txRampScale>:

Tx ramp scale:

Only valid for Tx or Tx+Rx mode.

Range: (0-1023), suggested range is (200-700) (too bigger will cause Tx saturated, and equipment could not detect it)

<rxGainCode>:

Rx gain code:

Only valid for Rx or Tx+Rx mode

Range: (0-49)

<rssiDbmValue>:

The Rssi value to be returned in case of GSM Rx mode and loop back mode.

Range: ((-110)-(-20))

Note: The example when use this AT command is as following:

This command only can be used when radio is off, so before using this command, send AT+CFUN=0,0 to turn off radio first.

1. Test GSM Rx

Start GSM Rx:

AT*GSMTR=1,1,10,6000,200,20

*GSMTR: -61

OK

Stop GSM RX:

AT*GSMTR=3

*GSMTR: -61

OK

2. Test GSM Tx

Start GSM Tx:

AT*GSMTR=0,1,10,6000,200,20

*GSMTR: -61

OK

Stop GSM Tx:

AT*GSMTR=3

*GSMTR: -61

OK

3. Test GSM Tx and Rx

Start GSM Tx and Rx:

AT*GSMTR=2,1,10,6000,200,20

*GSMTR: -61

OK

Stop GSM TX and RX:

AT*GSMTR=3

*GSMTR: -61

OK

3.15.6 AT*RFC

Description

This proprietary AT command is used to switch from AT command mode to DIAG mode on UART port in production mode (when power on, press END key will enter production mode). By default, in production mode, the UART port is in AT command mode. After executing this command, it will switch to DIAG mode.

Syntax

Command	Possible responses
*RFC	OK/+CME ERROR:<err>
*RFC=?	OK

3.15.7 AT*MODEMRESET

Description

This proprietary AT command is used to silent reset CP(depend on EEH final action setting).

Syntax

Command	Possible responses
*MODEMRESET[=<resetInfo>] <resetInfo>:string type, describe information to silent reset CP, max string length is 511.	OK/+CME ERROR Example: AT*MODEMRESET="timeout nums is 5, reach limit" OK

3.15.8 AT*HTCCTO

Description

This proprietary AT command is used to modify timeout values of AT commands.

Syntax

Command	Possible responses
*HTCCTO=<AT command>, <mode>, <timeout> <AT command>:AT command name, string type. <mode>(Note1): 1 SET 2 GET 3 SET+GET 4 TEST 5 SET+TEST 6 GET+TEST 7 SET+GET+TEST <timeout>: timeout value, (0-65536)	OK/+CME ERROR:<err> Example: AT*HTCCTO="+CMGF", 7, 10 OK

Note1: For action command, SET is equal ACTION. Note2: below is special case that can not use this command to modify timeout value: +CGACT= 155 seconds for active operation 55 seconds for deactivate operation ATD*99...# 155 seconds	
*HTCCTO=?	*HTCCTO: <AT command>, (1-7),<timeout> OK

3.15.9 AT*NASCHK

Description

This command is used to disable/enable NAS integrity check function.

Syntax

Command	Possible responses
*NASCHK=<flag> <flag>: 0 disable 1 enable	OK/+CME ERROR: <err>
*NASCHK?	*NASCHK:<flag> OK Example: *NASCHK:1 OK
*NASCHK=?	*NASCHK:(0,1) OK

3.15.10 AT*USBT

Description

This command is used to disable/enable USB Tethering.

Syntax

Command	Possible responses
*USBT=<flag> <flag>: 0 disable 1 enable	OK/+CME ERROR: <err>
*USBT=?	*USBT:(0,1) OK

3.15.11 AT*MOBILEDATA

Description

This command is used to disable/enable data access ability of mobile network.

Syntax

Command	Possible responses
*MOBILEDATA=<flag> <flag>: 0 disable 1 enable	OK/+CME ERROR: <err>
*MOBILEDATA=?	*MOBILEDATA:(0,1) OK

3.15.12 AT*RFTEMP

Description

This command is used to read RF temperature.

Syntax

Command	Possible responses
*RFTEMP=<tempType> <tempType>: 0: temperature in Celsius. 1: temperature in raw data.	*RFTEMP:<reqHandle>,<temp> OK

3.15.13 AT*LTECOEX

Description

This command is used to query/notify LTE status for coexit with WIFI/BT.

Syntax

Command	Possible responses
*LTECOEX=<enable> <enable>: 0 disable LTE coexist info indication. 1 enable LTE coexist info indication.	OK/+CME ERROR: <err>
*LTECOEX?	*LTECOEX:<isLteOn>,<rrcState>,<lteBand>,<earfcn>,[<td dUIDICfg>],[<tddSpecialSubframeConfig>],[<longDRXC ycle>],[<shortDRXCycle>]

<isLteOn>:
integer type, 1: current operating on LTE, 0: otherwise;

<rrcState>:
integer type, Current ERRC state, 1: connected, 0: idle;

<lteBand>:
integer type, LTE current operation band,
1-32: FDD Band1_32;
33-44: TDD Band33_44;

```

<earfcn>:
    integer type, Earfcn;
<tddUIDICfg>:
    integer type, TD-LTE UL/DL configuration index: 0-6;
<tddSpecialSubframeConfig>:
    integer type, TD-LTE special subframe configuration index: 0-9;
<longDRXCycle>:
    integer type, long DRX cycle in ms;
<shortDRXCycle>:
    integer type, short DRX cycle in ms.

```

3.15.14 AT+CPLMNS

Description

This command is used to request to cancel the manual PLMN search.

Syntax

Command	Possible responses
+CPLMNS	OK

3.15.15 AT*PMICREG

Description

This command is used to get/set the specified register of current PMIC

Syntax

Command	Possible responses
*PMICREG=<operation >,<page>,<reg address>[,<reg value>]	If < operation >=W or w: OK/+CME ERROR: <err> If < operation >=R or r: *PMICREG: <page>,<reg address>,<reg value> OK
* PMICREG?	Read all PMIC related registers: *PMICREG: <page>,<reg address>,<reg value> *PMICREG: <page>,<reg address>,<reg value> *PMICREG: <page>,<reg address>,<reg value> OK
* PMICREG=?	*PMICREG: <op>,<page>,<reg address>[,<reg value>] OK

Defined values

<operation >: string type

W or w: write value to register

R or r: read value from register

< page >: integer type

0: base page
 1: power page
 2: GPADC page
 < reg address >: hex numeric type, range (0-FF)
 < reg value >: hex numeric type, range (0-FF)

Example:

```
AT*PMICREG=R,2,D
*PMICReg:2,d,0
OK
```

```
AT*PMICREG=W,2,D,7
OK
```

3.15.16 AT*REGRW

Description

This command is used to read/write the memory address.

Syntax

Command	Possible responses
*REGRW=<operation>,<mem address>[,<mem value>]	If < operation >=W or w: OK/+CME ERROR: <err> If < operation >=R or r: *REGRW: <mem address>,<mem value> OK
*REGRW?	OK
*REGRW =?	*REGRW: <op>,<mem address>[,<mem value>] OK

Defined values

< operation >: string type
 W or w: write value to register
 R or r: read value from register

< mem address >: hex string type
 < mem value >: hex string type

Example:

```
AT*REGRW=R, D401E2C0
*REGRW: d401e2c0, b040
OK
```

```
AT*REGRW=W,D401E2C0,FFFF
OK
```

3.15.17 AT*PROD

Description

This command is used to set diag cache flag.
Besides, send AT*PROD=1 will enter production mode.

Syntax

Command	Possible responses
*PROD= <value>	OK/+CME ERROR
*PROD=?	*PROD: (0,1) OK
*PROD?	*PROD: <value>

Defined values

<value>, integer type:

- 1 diag log will be transmitted to usb directly without cache
- 0 diag log will be transmitted to usb directly after cached to a specified size

Examples:

AT* PROD=1

OK

3.15.18 AT* NVMFLUSH

Description

This command is to flush nvm file in psram to flash.

Syntax

Command	Possible responses
*NVMFLUSH=<value>	OK <ul style="list-style-type: none">- if no error happens+CME ERROR: <err><ul style="list-style-type: none">- if any parameters are not right- if error when flushing nvm files to flash
*NVMFLUSH =?	*NVMFLUSH:(0-1)

Defined values

<value> integer type, should be 1

Note:

1. If we want to flush the nvm files to flash, we need to use the following steps:
AT+CFUN=0
AT*NVMFLUSH=1
Wait until it returns ok
2. If a file is modified by acat tool (-flash explorer) and needs being written to flash, we need to send AT*PROD=1 to make sure open flash explorer without failure.
3. When the flush is done, it will return ok.

Examples:

AT* NVMFLUSH=1

OK

3.15.19 AT*PLATCFG

Description

This command is used to config diag output option and eeh dump option

Syntax

Command	Possible responses
*PLATCFG=<cfgType>[, <cfgVal>]	<p>*PLATCFG=<cfgType> means get current config value of the <cfgType></p> <p>*PLATCFG:<cfgType>, <cfgVal> OK – if no error happens +CME ERROR: <err> – if any parameters are not right</p> <p>*PLATCFG=<cfgType>,<cfgVal> means set the config value of the <cfgType></p> <p>OK – if no error happens +CME ERROR: <err> – if any parameters are not right</p>
*PLATCFG =?	*PLATCFG:(0-1),(0-2)

Defined values

<cfgType> integer type
0 config diag option
1 config EEH dump option

<cfgVal> integer type
For diag configuration:
0 diag output over USB
1 diag output to SD
2 diag output over SPI

For EEH dump configuration:
0 eeh dump to SD
1 eeh dump over SPI

3.15.20 AT*FLASHTEST

Description

This command is used to test internal 8M spi flash stability. Internal use.

Syntax

Command	Possible responses
*FLASHTEST=<addrStart>,<length>,<stepSize>	OK – if no error happens +CME ERROR: <err> – if any parameters are not right
*FLASHTEST =?	*FLASHTEST:(0-0x800000),(0-0x800000), (0-0x800000)

Defined values

<addrStart>: hex numeric type, range (0-800000)

<length>: hex numeric type, range (0-800000)

<stepSize>: hex numeric type, range (0-800000)

Example:

//Test from 0x100000, length set to 512K, step size set to 1M

AT*FLASHTEST =100000, 80000, 100000

* FLASHTEST: PASS

OK

3.15.21 AT*SULOGCFG

Description

This command is config sulog option, including work mode, log level and output mode.

Syntax

Command	Possible responses
*SULOGCFG=<type>,<printLvl1>,<printLvl2>,<logCfg>,<saved>	OK – if no error happens +CME ERROR: <err> – if any parameters are not right
*SULOGCFG?	*SULOGCFG: <type>,<printLvl1>,<printLvl2>,<logCfg>
*SULOGCFG =?	*SULOGCFG: (range of <type>), (range of <printLvl1>), (range of <printLvl2>), (range of <logCfg>), (range of <saved>) OK

Defined values

<type>: integer type,su log mode, need save to NVM and take effect after reboot

0 sulog off

1 sulog hw+sw mode

2 sulog hardware mode

3 sulog software mode

<printLvl1>/<printLvl2>: hex numeric type, control the print log level for each L1 module, each module use 2 bits to indicate the log level (0-off, 1-level1, 2-level2, 3-level3)

```

typedef union
{
    struct
    {
        UINT32 LTE_ULPATH_MODULE : 2; // 1
        UINT32 LTE_ICS_MODULE : 2;
        UINT32 LTE_RF_MODULE : 2;
        UINT32 LTE_L1_SCHEDULE_MODULE : 2;
        UINT32 LTE_CE_CONFIG_MODULE : 2;
        UINT32 LTE_MEAS_MODULE : 2;
        UINT32 LTE_DFE_MODULE : 2;
        UINT32 LTE_CCM_MODULE : 2;
        UINT32 LTE_DL_HARQ_MODULE : 2;
        UINT32 LTE_AXC_MODULE : 2; // 10
        UINT32 LTE_CSI_MODULE : 2;
        UINT32 LTE_DCH_MODULE : 2;
        UINT32 LTE_EMACSF_MODULE : 2;
        UINT32 LTE_MSR_IN_TD GSM_MODULE : 2;
        UINT32 LTE_MRAT_MODULE : 2;
        UINT32 LTE_IRAT_GSM_MODULE : 2;
        UINT32 LTE_MEAS_IN_IRAT_MODULE : 2;
        UINT32 LTE_DS_SCM_MODULE : 2;
        UINT32 LTE_HW_MODULE_MODULE : 2;
        UINT32 LTE_IPC2RCAT_MODULE : 10; // 20
    }
    UINT32 value32[2];
} ? end {anonLtePrintLevelStruct} : LtePrintLevelStruct;

```

<logCfg >: integer type

0 sulog output over USB

1 sulog output to SD

< saved >: integer type, whether save configuration to NVM

0 configuration NOT saved to NVM

1 configuration saved to NVM

Example:

AT*SULOGCFG=?

*SULOGCFG: (0-3),(0xFFFFFFFF),(0xFFFFFFFF),(0-1),(0-1)

OK

AT*SULOGCFG?

*SULOGCFG: 1, 0x4a656515, 0x55, 0

OK

AT*SULOGCFG=1,EFFFEDDE,78EFE9FE,1,0

OK

4

AT Command – CCI Primitive Mapping

Table 5: Summary of CCI Primitives

AT commands	CCI Primitives	
“AT+CGSN”, “AT+GSN”, “AT+GSN?”	CI_DEV_PRIM_GET_SERIALNUM_ID_REQ	
“AT+CIMI”	CI_SIM_PRIM_GET_SUBSCRIBER_ID_REQ	
“ATA”	CI_CC_PRIM_ANSWER_CALL_REQ	
“ATD[Tt]*99...#”	CI_PS_PRIM_ENTER_DATA_STATE_REQ	
“ATD**04*...#”, “ATD**05*...#”, “ATD**042*...#”, “ATD**052*...#”	CI_SIM_PRIM_OPERCHV_REQ	
Call forwarding MMI code (SC=21/67/61/62/ 002/004)	“ATD*SC...#”, “ATD#SC...#” “ATD#SC...#” “ATD*SC...#”, “ATD**SC...#” “ATD##SC...#” “ATD*SC...#”, “ATD#SC...#”, “ATD**SC...#” “ATD*SC...#” “ATD#SC...#” “ATD*SC...#” “ATD#SC...#” “ATD*SC...#” “ATD#SC...#” “ATD*SC...#” “ATD#SC...#” “ATD*SC...#”, “ATD#SC...#”, “ATD#SC...#”, “ATD**SC...#”, “ATD#SC...#” “ATD*SC...#”, “ATD#SC...#”, “ATD**SC...#” “ATD*SC...#”, “ATD**SC...#” “ATD##3424*9#” “ATD<number>[l][l]” AT+CDU=	CI_SS_PRIM_SET_CF_ACTIVATION_REQ CI_SS_PRIM_INTERROGATE_CF_INFO_REQ CI_SS_PRIM_REGISTER_CF_INFO_REQ CI_SS_PRIM_ERASE_CF_INFO_REQ CI_SS_PRIM_SET_CW_ACTIVATION_REQ CI_SS_PRIM_GET_ACTIVE_CW_CLASSES_REQ CI_SS_PRIM_GET_COLP_STATUS_REQ CI_SS_PRIM_GET_CLIR_STATUS_REQ CI_SS_PRIM_GET_COLR_STATUS_REQ CI_SS_PRIM_GET_CLIP_STATUS_REQ CI_SS_PRIM_GET_CNAP_STATUS_REQ CI_SS_PRIM_CHANGE_CB_PASSWORD_REQ CI_SS_PRIM_SET_CB_ACTIVATE_REQ CI_SS_PRIM_GET_CB_MAP_STATUS_REQ if USSD operations is idle: CI_SS_PRIM_START_USSD_SESSION_REQ, otherwise: CI_SS_PRIM_RECEIVED_USSD_INFO_RSP CI_DEV_PRIM_COMM_ASSERT_REQ CI_CC_PRIM_MAKE_CALL_REQ
“AT*DIALE=”	CI_CC_PRIM_MAKE_CALL_REQ	
“ATH”	CI_CC_PRIM_RELEASE_CALL_REQ	
“AT+CBST=”	CI_CC_PRIM_SET_DATA_BSTYPE_REQ	
“AT+CBST?”	CI_CC_PRIM_GET_DATA_BSTYPE_REQ	

"AT+CBST=?"	CI_CC_PRIM_GET_SUPPORTED_DATA_BSTYPES_REQ
"AT+CRLP=?"	CI_CC_PRIM_SET_RLP_CFG_REQ
"AT+CRLP?"	CI_CC_PRIM_GET_RLP_CFG_REQ
"AT+CRLP=?"	CI_CC_PRIM_GET_RLP_CAP_REQ
"AT+ECHUPVT=<cause>"	CI_CC_PRIM_REFUSE_CALL_REQ
"AT+ECHUPVT"	CI_CC_PRIM_RELEASE_CALL_REQ
"AT+CREG=?"	CI_MM_PRIM_SET_REGRESULT_OPTION_REQ
"AT+CREG?"	CI_MM_PRIM_GET_REGRESULT_INFO_REQ
"AT+CIND=?"	CI_MM_PRIM_ENABLE_NETWORK_MODE_IND_REQ
"AT+COPS=0"	CI_MM_PRIM_AUTO_REGISTER_REQ
"AT+COPS=1/4,...."	CI_MM_PRIM_MANUAL_REGISTER_REQ
"AT+COPS=2"	CI_MM_PRIM_DEREGISTER_REQ
"AT+COPS=3,...."	CI_MM_PRIM_SET_ID_FORMAT_REQ
"AT+COPS?"	CI_MM_PRIM_GET_CURRENT_OPERATOR_INFO_REQ
"AT+COPS=?"	CI_MM_PRIM_GET_NUM_NETWORK_OPERATORS_REQ
"AT+CPOL=[<index>],[<format>],<oper>"	CI_MM_PRIM_ADD_PREFERRED_OPERATOR_REQ
"AT+CPOL=<index>"	CI_MM_PRIM_DELETE_PREFERRED_OPERATOR_REQ
"AT+CPOL=<format>"	CI_MM_PRIM_SET_ID_FORMAT_REQ
"AT+COPN"	CI_MM_PRIM_GET_NITZ_INFO_REQ
"AT+CLKC=<call barring facility>, 0/1"	CI_SS_PRIM_SET_CB_ACTIVATE_REQ
"AT+CLKC=<call barring facility>, 2"	CI_SS_PRIM_GET_CB_MAP_STATUS_REQ
"AT+CLKC=<MEP facility>,...."	CI_SIM_PRIM_PERSONALIZEME_REQ
"AT+CLKC=<other facility>,...."	CI_SIM_PRIM_LOCK_FACILITY_REQ
"AT+CPWD=<call barring facility>,...."	CI_SS_PRIM_CHANGE_CB_PASSWORD_REQ
"AT+CPWD=SC/P2,...."	CI_SIM_PRIM_OPERCHV_REQ
"AT+CLIP=?"	CI_SS_PRIM_SET_CLIP_OPTION_REQ
"AT+CLIP?"	CI_SS_PRIM_GET_CLIP_STATUS_REQ
"AT+CLIR=?"	CI_SS_PRIM_SET_CLIR_OPTION_REQ
"AT+CLIR?"	CI_SS_PRIM_GET_CLIR_STATUS_REQ
"AT+COLP=?"	CI_SS_PRIM_SET_COLP_OPTION_REQ
"AT+COLP?"	CI_SS_PRIM_GET_COLP_STATUS_REQ
"AT+COLR?"	CI_SS_PRIM_GET_COLR_STATUS_REQ
"AT+CNAP=?"	CI_SS_PRIM_SET_CNPAP_OPTION_REQ
"AT+CNAP?"	CI_SS_PRIM_GET_CNPAP_STATUS_REQ
"AT+CCFC=<reason>,0/1"	CI_SS_PRIM_SET_CF_ACTIVATION_REQ

"AT+CCFC=<reason>,2"	CI_SS_PRIM_INTERROGATE_CF_INFO_REQ
"AT+CCFC=<reason>,3"	CI_SS_PRIM_REGISTER_CF_INFO_REQ
"AT+CCFC=<reason>,4"	CI_SS_PRIM_ERASE_CF_INFO_REQ
"AT+CCWA=,2"	CI_SS_PRIM_GET_ACTIVE_CW_CLASSES_REQ
"AT+CCWA=,0/1"	CI_SS_PRIM_SET_CW_ACTIVATION_REQ
"AT+CHLD=19"	CI_CC_PRIM_RELEASE_ALL_CALLS_REQ
"AT+CHLD=1/1X" (X is from 1 to 7)	CI_CC_PRIM_RELEASE_CALL_REQ
"AT+CHLD=0/2/2X/3/4" (X is from 1 to 7)	CI_CC_PRIM_MANIPULATE_CALLS_REQ
"AT+CUSD=2"	CI_SS_PRIM_ABORT_USSD_SESSION_REQ
"AT+CUSD=0/1, ##3424*9#"	CI_DEV_PRIM_COMM_ASSERT_REQ
"AT+CUSD=0/1,"	If USSD operations is idle: CI_SS_PRIM_START_USSD_SESSION_REQ, otherwise: CI_SS_PRIM_RECEIVED_USSD_INFO_RSP
"AT+CAOC=0"	CI_CC_PRIM_GET_CCM_VALUE_REQ
"AT+CAOC=1"	CI_SS_PRIM_SET_CCM_OPTION_REQ
"AT+CAOC=2"	CI_SS_PRIM_SET_CCM_OPTION_REQ
"AT+CAOC?"	CI_SS_PRIM_GET_CCM_OPTION_REQ
"AT+VTS=<DTMF string>, [<duration>]"	If <duration> is not equal previous set CI_CC_PRIM_SET_DTMF_PACING_REQ, CI_CC_PRIM_SEND_DTMF_STRING_REQ otherwise: CI_CC_PRIM_SEND_DTMF_STRING_REQ
"AT\$VTS=<DTMF>,1"	CI_CC_PRIM_START_DTMF_REQ
"AT\$VTS=<DTMF>,0"	CI_CC_PRIM_STOP_DTMF_REQ
"AT+VTD="	CI_CC_PRIM_SET_DTMF_PACING_REQ
"AT+VTD?"	CI_CC_PRIM_GET_DTMF_PACING_REQ
"AT+CSSN="	CI_SS_PRIM_SET_SS_NOTIFY_OPTIONS_REQ
"AT+CSSN?"	CI_SS_PRIM_GET_SS_NOTIFY_OPTIONS_REQ
"AT+CLCC"	CI_CC_PRIM_LIST_CURRENT_CALLS_REQ
"AT+CFUN="	CI_DEV_PRIM_SET_FUNC_REQ
"AT+CFUN?"	CI_DEV_PRIM_GET_FUNC_REQ
"AT*CFUN="	CI_DEV_PRIM_SET_FUNC_REQ
"AT*CFUN?"	CI_DEV_PRIM_GET_FUNC_REQ
"AT+CPIN="	CI_SIM_PRIM_OPERCHV_REQ
"AT+CPIN?"	CI_SIM_PRIM_GET_PIN_STATE_REQ
"AT+CPIN2="	CI_SIM_PRIM_OPERCHV_REQ
"AT+CPIN2?"	CI_SIM_PRIM_GET_PIN_STATE_REQ
"AT+EPIN?"	CI_SIM_PRIM_GET_PIN_STATE_REQ
"AT*SIMDETEC="	CI_SIM_PRIM_GET_PIN_STATE_REQ
"AT+CTZR?"	CI_MM_PRIM_GET_NITZ_INFO_REQ
"AT*CTZR?"	CI_MM_PRIM_GET_NITZ_INFO_REQ
"AT+BGLTEPLMN="	CI_MM_PRIM_SET_LTE_BACKGROUND_INFO_REQ
"AT+BGLTEPLMN?"	CI_MM_PRIM_GET_LTE_BACKGROUND_INFO_REQ
"AT+BGLTEPLMN=?"	CI_MM_PRIM_GET_NUM_LTE_NETWORK_OPERATORS_REQ CI_MM_PRIM_GET_LTE_NETWORK_OPERATOR_INFO_REQ

"AT^SYSCONFIG"	CI_DEV_PRIM_SET_BAND_MODE_REQ
"AT^SYSCONFIG?"	CI_DEV_PRIM_GET_BAND_MODE_REQ
"AT+WS46"	CI_DEV_PRIM_SET_BAND_MODE_REQ
"AT+WS46?"	CI_DEV_PRIM_GET_BAND_MODE_REQ
"AT*CSQ"	CI_MM_PRIM_SET_SIGQUALITY_IND_CONFIG_REQ
"AT*CSQ?"	CI_MM_PRIM_GET_SIGQUALITY_IND_CONFIG_REQ
"AT*URSLCT"	CI_MM_PRIM_TRIGGER_USER_RESELECTION_REQ
"AT*PWRPLMN?"	CI_MM_PRIM_GET_POWER_UP_PLMN_MODE_REQ
"AT*PWRPLMN= "	CI_MM_PRIM_SET_POWER_UP_PLMN_MODE_REQ
"AT+CPBS= "	CI_PB_PRIM_SELECT_PHONEBOOK_REQ
"AT+CPBS?"	CI_PB_PRIM_GET_PHONEBOOK_INFO_REQ
"AT+CPBS=? "	CI_PB_PRIM_GET_SUPPORTED_PHONEBOOKS_REQ
"AT+CPBR=<index1>[,<index2>]"	(Numbers of below request dependent on <index1> and <index2> value set) CI_PB_PRIM_READ_PHONEBOOK_ENTRY_REQ
"AT+CPBR=? "	CI_PB_PRIM_GET_PHONEBOOK_INFO_REQ
"AT+CPBW=<index>"	CI_PB_PRIM_DELETE_PHONEBOOK_ENTRY_REQ
"AT+CPBW=<index>,<number>,...."	If index is valid: CI_PB_PRIM_REPLACE_PHONEBOOK_ENTRY_REQ Otherwise: CI_PB_PRIM_ADD_PHONEBOOK_ENTRY_REQ
"AT+CPBF= "	(Numbers of CI_PB_PRIM_READ_PHONEBOOK_ENTRY_REQ dependent on total number of entries) CI_PB_PRIM_GET_PHONEBOOK_INFO_REQ CI_PB_PRIM_READ_PHONEBOOK_ENTRY_REQ
"AT*CPBC"	CI_PB_PRIM_GET_PHONEBOOK_CAPA_REQ
"AT*FDNBYPASS"	CI_PB_PRIM_BYPASS_FDN_CHECK_REQ
"AT+CSIM= "	CI_SIM_PRIM_EXECCMD_REQ
"AT+CRSM= "	CI_SIM_PRIM_GENERIC_CMD_REQ
"AT+MSTK=0"	CI_SIM_PRIM_ENABLE_SIMAT_INDS_REQ
"AT+MSTK=1"	CI_SIM_PRIM_DOWNLOADPROFILE_REQ
"AT+MSTK=2"	CI_SIM_PRIM_GET_SIMAT_NOTIFY_CAP_REQ
"AT+MSTK=3"	CI_SIM_PRIM_GET_TERMINALPROFILE_REQ
"AT+MSTK=4"	CI_SIM_PRIM_ENVELOPE_CMD_REQ
"AT+MSTK=11"	CI_SIM_PRIM_PROACTIVE_CMD_RSP
"AT+MSTK=12"	CI_SIM_PRIM_GET_CALL_SETUP_ACK_RSP
"AT+CACM=[<password>]"	If <password> specified: CI_SIM_PRIM_OPERCHV_REQ CI_CC_PRIM_RESET_ACMM_VALUE_REQ Otherwise: CI_CC_PRIM_RESET_ACMM_VALUE_REQ CI_CC_PRIM_GET_ACMM_VALUE_REQ
"AT+CACM?"	If <password> specified: CI_SIM_PRIM_OPERCHV_REQ CI_CC_PRIM_SET_ACMMAX_VALUE_REQ Otherwise: CI_CC_PRIM_SET_ACMMAX_VALUE_REQ CI_CC_PRIM_GET_ACMMAX_VALUE_REQ
"AT+CAMM=[acmmmax]<,<passwd>]"	CI_SS_PRIM_SET_AOC_WARNING_ENABLE_REQ CI_SS_PRIM_GET_AOC_WARNING_ENABLE_REQ
"AT+CAMM?"	CI_PS_PRIM_ENABLE_NW_REG_IND_REQ CI_PS_PRIM_GET_NW_REG_STATUS_REQ
"AT+CCWE= "	
"AT+CCWE?"	
"AT+CGREG= "	
"AT+CGREG?"	

"AT+CIREG="	CI_PS_PRIM_SET_IMS_REG_INFO_IND_REQ
"AT+CIREG?"	CI_PS_PRIM_GET_IMS_REG_INFO_REQ
"AT+CGATT="	CI_PS_PRIM_SET_ATTACH_STATE_REQ
"AT+CGATT?"	CI_PS_PRIM_GET_ATTACH_STATE_REQ
"AT+CGACT="	CI_PS_PRIM_SET_PDP_CTX_ACT_STATE_REQ
"AT+CGACT?"	CI_PS_PRIM_GET_PDP_CTX_REQ
"AT+CGDATA="	CI_PS_PRIM_ENTER_DATA_STATE_REQ
"AT+CGDCONT=<cid>"	CI_PS_PRIM_DELETE_PDP_CTX_REQ
"AT+CGDCONT=<cid>,...."	CI_PS_PRIM_DEFINE_PDP_CTX_REQ (There are 8 below request)
"AT+CGDCONT?"	CI_PS_PRIM_GET_PDP_CTX_REQ
"AT+CGDSCONT=<cid>" CI_PS_PRIM_DELETE_SEC_PDP_CTX_REQ
"AT+CGDSCONT=<cid>,...."	CI_PS_PRIM_DEFINE_SEC_PDP_CTX_REQ (There are 8 below request)
"AT+CGDSCONT?"	CI_PS_PRIM_GET_SEC_PDP_CTX_REQ
"AT+CGDSCONT=?" CI_PS_PRIM_GET_PDP_CTX_REQ
"AT+CGQMIN="	CI_PS_PRIM_SET_QOS_REQ (There are 8 below request)
"AT+CGQMIN?"	CI_PS_PRIM_GET_QOS_REQ
"AT+CGQMIN=?" CI_PS_PRIM_GET_QOS_CAPS_REQ
"AT+CGQREQ="	CI_PS_PRIM_SET_QOS_REQ (There are 8 below request)
"AT+CGQREQ?"	CI_PS_PRIM_GET_QOS_REQ
"AT+CGQREQ=?" CI_PS_PRIM_GET_QOS_CAPS_REQ
"AT+CGEQREQ="	CI_PS_PRIM_SET_3G_QOS_REQ (There are 8 below request)
"AT+CGEQREQ?"	CI_PS_PRIM_GET_3G_QOS_REQ
"AT+CGEQREQ=?" CI_PS_PRIM_GET_3G_QOS_CAPS_REQ
"AT+CGEQMIN="	CI_PS_PRIM_SET_3G_QOS_REQ (There are 8 below request)
"AT+CGEQMIN?"	CI_PS_PRIM_GET_3G_QOS_REQ
"AT+CGEQMIN=?" CI_PS_PRIM_GET_3G_QOS_CAPS_REQ
"AT+GETIP="	CI_PS_PRIM_GET_PDP_CTX_REQ
"AT*AUTHQeq="	CI_PS_PRIM_AUTHENTICATE_REQ
"AT+CGEQOS="	CI_PS_PRIM_SET_4G_QOS_REQ/CI_PS_PRIM_DELETE_PDP_CTX_REQ (There are 15 below request)
"AT+CGEQOS?"	CI_PS_PRIM_GET_4G_QOS_REQ
"AT+CGEQOS=?"	CI_PS_PRIM_GET_4G_QOS_CAPS_REQ
"AT+CEREG="	CI_PS_PRIM_ENABLE_4G_NW_REG_IND_REQ
"AT+CEREG?"	CI_PS_PRIM_GET_4G_NW_REG_STATUS_REQ
"AT+CGCONTRDP="	CI_PS_PRIM_READ_4G_PDP_CTX_DYN_PARA_REQ
"AT+CGCONTRDP=?"	CI_PS_PRIM_READ_4G_PDP_CTXS_ACT_DYN_PARA_REQ
"AT+CGSCONTRDP="	CI_PS_PRIM_READ_4G_SEC_PDP_CTX_DYN_PARA_REQ
"AT+CGSCONTRDP=?"	CI_PS_PRIM_READ_4G_SEC_PDP_CTXS_ACT_DYN_PARA_REQ
"AT+CGTFTRDP="	CI_PS_PRIM_READ_4G_TRAFFIC_FLOW_TEMP_DYN_PARA_REQ
"AT+CGTFTRDP=?"	CI_PS_PRIM_READ_4G_TRAFFIC_FLOW_TEMP_DYN_PARA_CAPS_REQ
"AT+CGEQOSRDP="	CI_PS_PRIM_READ_4G_QOS_DYN_PARA_REQ
"AT+CGEQOSRDP=?"	CI_PS_PRIM_READ_4G_QOS_DYN_PARA_CAPS_REQ
"AT+CGEREP="	CI_PS_PRIM_SET_4G_EVET REP_REQ

"AT+CGEREP?"	CI_PS_PRIM_GET_4G_EVET_REP_REQ
"AT+CGEREP=?"	CI_PS_PRIM_GET_4G_EVET_REP_CAPS_REQ
"AT+CVMOD="	CI_PS_PRIM_SET_4G_VOICE_CALL_MODE_REQ
"AT+CVMOD?"	CI_PS_PRIM_GET_4G_VOICE_CALL_MODE_REQ
"AT+CVMOD=?"	CI_PS_PRIM_GET_4G_VOICE_CALL_MODE_CAPS_REQ
"AT+CEMODE="	CI_PS_PRIM_SET_4G_MODE_REQ
"AT+CEMODE?"	CI_PS_PRIM_GET_4G_MODE_REQ
"AT+CEMODE=?"	CI_PS_PRIM_GET_4G_MODE_CAPS_REQ
"AT+CGPADDR="	CI_PS_PRIM_GET_PDP_ADDR_REQ
"AT+CGPADDR=?"	CI_PS_PRIM_GET_PDP_ADDR_LIST_REQ
"AT+CGCLASS="	CI_PS_PRIM_SET_GSMGPRS_CLASS_REQ
"AT+CGCLASS?"	CI_PS_PRIM_GET_GSMGPRS_CLASS_REQ
"AT+CGCLASS=?"	CI_PS_PRIM_GET_GSMGPRS_CLASSES_REQ
"AT*CGDFLT="	CI_PS_PRIM_DEFINE_DEFAULT_PDP_CTXT_REQ
"AT*CGDFLT?"	CI_PS_PRIM_GET_DEFAULT_PDP_CTXT_REQ
"AT+VZWAPNE="	CI_PS_PRIM_SET_APN_REQ
"AT+VZWAPNE?"	CI_PS_PRIM_GET_APN_REQ
"AT*VZWTESTAPP="	CI_DAT_PRIM_TEST_APP_REQ
"AT+CMSS="	CI_MSG_PRIM_SEND_STORED_MESSAGE_REQ
"AT+CMGS="	CI_MSG_PRIM_SEND_MESSAGE_REQ
"AT+CMGR="	CI_MSG_PRIM_READ_MESSAGE_REQ
"AT+CMGW="	CI_MSG_PRIM_WRITE_MESSAGE_REQ
"AT+CSCA="	CI_MSG_PRIM_SET_SMSC_ADDR_REQ
"AT+CSCA?"	CI_MSG_PRIM_GET_SMSC_ADDR_REQ
"AT+CSCB="	CI_MSG_PRIM_SET_CBM_TYPES_REQ
"AT+CSCB?"	CI_MSG_PRIM_GET_CBM_TYPES_REQ
"AT*CSCB="	CI_MSG_PRIM_SET_CBM_TYPES_REQ
"AT*CSCB?"	CI_MSG_PRIM_GET_CBM_TYPES_REQ
"AT*CBMCS="	CI_MSG_PRIM_SET_FILTER_STATUS_REQ
"AT*CBMCS?"	CI_MSG_PRIM_GET_FILTER_STATUS_REQ
"AT+CNMI="	CI_MSG_PRIM_CONFIG_MSG_IND_REQ
"AT+CGSMS="	CI_MSG_PRIM_SET_MOSMS_SERVICE_REQ
"AT+CGSMS?"	CI_MSG_PRIM_GET_MOSMS_SERVICE_REQ
"AT+CMGD=,0/1/2/3"	CI_MSG_PRIM_DELETE_MESSAGE_REQ (Numbers of CI_MSG_PRIM_DELETE_MESSAGE_REQ dependent on total message numbers in memory)
"AT+CMGD=,4"	CI_MSG_PRIM_GET_CURRENT_STORAGE_INFO_REQ CI_MSG_PRIM_DELETE_MESSAGE_REQ (Numbers of CI_MSG_PRIM_READ_MESSAGE_REQ dependent on total message numbers in memory)
"AT+CMGD=?"	CI_MSG_PRIM_GET_CURRENT_STORAGE_INFO_REQ CI_MSG_PRIM_READ_MESSAGE_REQ (Numbers of CI_MSG_PRIM_READ_MESSAGE_REQ dependent on total message numbers in memory)
"AT+CMGL="	CI_MSG_PRIM_GET_CURRENT_STORAGE_INFO_REQ CI_MSG_PRIM_READ_MESSAGE_REQ CI_MSG_PRIM_SELECT_SERVICE_REQ
"AT+CSMS="	CI_MSG_PRIM_GET_CURRENT_SERVICE_INFO_REQ
"AT+CSMS?"	CI_MSG_PRIM_GET_SUPPORTED_SERVICES_REQ
"AT+CPMS=?"	CI_MSG_PRIM_SELECT_STORAGES_REQ
"AT+CPMS?"	CI_MSG_PRIM_GET_CURRENT_STORAGE_INFO_REQ

"AT+CPMS=?"	CI_MSG_PRIM_GET_SUPPORTED_STORAGES_REQ
"AT+VPDUS=?"	CI_DAT_PRIM_GET_MAX_PDU_SIZE_REQ
"AT+CPUC=<currency>,<ppu>[,<passwd>]"	If <password> specified: CI_SIM_PRIM_OPERCHV_REQ CI_CC_PRIM_SET_PUCT_INFO_REQ Otherwise: CI_CC_PRIM_SET_PUCT_INFO_REQ
"AT+CPUC?"	CI_CC_PRIM_GET_PUCT_INFO_REQ
"AT+CHUP"	CI_CC_PRIM_RELEASE_CALL_REQ
"AT+CSTA=?"	CI_CC_PRIM_SET_NUMBERTYPE_REQ
"AT+CDIP=?"	CI_CC_PRIM_GET_NUMBERTYPE_REQ
"AT+CPLS=?"	CI_SS_PRIM_SET_CDIP_OPTION_REQ
"AT+CGCMOD=?"	CI_SS_PRIM_GET_CDIP_STATUS_REQ
"AT+CGCMOD?"	CI_MM_PRIM_SELECT_PREFERRED_PLMN_LIST_REQ
"AT+CNUM"	CI_MM_PRIM_GET_PREFERRED_PLMN_LIST_REQ
"AT+DS=?"	CI_PS_PRIM_MODIFY_PDP_CTX_REQ
"AT+DS?"	CI_PS_PRIM_GET_PDP_CTXS_ACT_STATE_REQ (Numbers of CI_MM_PRIM_GET_SUBSCRIBER_INFO_REQ dependent on MSISDN numbers of subscriber)
"AT+DS=?"	CI_MM_PRIM_GET_NUM_SUBSCRIBER_NUMBERS_REQ
"AT+CGTFT=<cid>"	CI_MM_PRIM_GET_SUBSCRIBER_INFO_REQ
"AT+CGTFT=<cid>,...." CI_CC_PRIM_SET_DATACOMP_REQ
"AT+CGTFT?"	CI_CC_PRIM_GET_DATACOMP_REQ
"AT*BAND=?"	CI_CC_PRIM_GET_DATACOMP_CAP_REQ
"AT*BAND?"	CI_PS_PRIM_DELETE_TFT_REQ
"AT*BANDIND=?"	CI_PS_PRIM_DEFINE_TFT_FILTER_REQ (There are 8 below request)
"AT*BANDIND?"	CI_PS_PRIM_GET_PDP_CTX_REQ
"AT*CLKC=?" CI_DEV_PRIM_SET_BAND_MODE_REQ
"AT*MEPCG=?"	CI_DEV_PRIM_GET_BAND_MODE_REQ
"AT*ENVSIM"	CI_DEV_PRIM_GET_SUPPORTED_BAND_MODE_REQ
"AT*ENVSIM?"	CI_MM_PRIM_SET_BANDIND_REQ
"AT*CNMA=?"	CI_MM_PRIM_GET_BANDIND_REQ
"AT*POWERIND=?"	CI_SIM_PRIM_PERSONALIZEME_REQ
"AT*FASTDORM"	CI_SIM_PRIM_READ_MEPCODES_REQ
"AT*FDY=?"	CI_SIM_PRIM_SET_VSIM_REQ
"AT*PSPG=""	CI_SIM_PRIM_GET_VSIM_REQ
"AT*CGATT=?"	CI_MSG_PRIM_NEWSMSG_RSP
"AT*CGATT?"	CI_DEV_PRIM_AP_POWER_NOTIFY_REQ
"AT+EEMOPT=?"	CI_PS_PRIM_FAST_DORMANT_REQ
"AT+ERGA=?"	CI_PS_PRIM_SET_FAST_DORMANCY_CONFIG_REQ
"AT+ERTCA=?"	CI_PS_PRIM_SET_PS_PAGING_CONFIG_REQ
"AT+LPNWUL=?"	CI_PS_PRIM_ENABLE_POWERON_AUTO_ATTACH_REQ
"AT+LPLOCVR=?"	CI_PS_PRIM_GET_POWERON_AUTO_ATTACH_STATUS_REQ
"AT*CellLock=?"	CI_DEV_PRIM_SET_ENGMODE_REPORT_OPTION_REQ
"AT*Cell=?"	CI_SIM_PRIM_GENERIC_CMD_REQ
	CI_SIM_PRIM_GENERIC_CMD_REQ
	CI_DEV_PRIM_LP_NWUL_MSG_REQ
	CI_SS_PRIM_LOCATION_VERIFY_RSP
	CI_MM_PRIM_CELL_LOCK_REQ
	CI_MM_PRIM_WB_CELL_LOCK_REQ

"AT*LTEPOWER="	CI_DEV_PRIM_SET_LTE_MODE_TX_RX_REQ
"AT*GSMTR="	CI_DEV_PRIM_SET_GSM_MODE_TX_RX_REQ
"AT+OFF"	CI_DEV_PRIM_SET_FUNC_REQ
"AT*CGSN="	CI_DEV_PRIM_SET_SV_REQ
"AT*CGSN?"	CI_DEV_PRIM_GET_SV_REQ
"AT+CMEFULL=	CI_MSG_PRIM_RESET_MEMCAP_FULL_REQ
"AT*EHSDPA=	CI_DEV_PRIM_ENABLE_HSDPA_REQ
"AT*EHSDPA?"	CI_DEV_PRIM_GET_HSDPA_STATUS_REQ
"AT^DCTS=	CI_DEV_PRIM_SET_NETWORK_MONITOR_OPTION_REQ
"AT^DCTS?"	CI_DEV_PRIM_GET_NETWORK_MONITOR_OPTION_REQ
"AT*GRIP=	CI_DEV_PRIM_SET_POWER_BACK_OFF_REQ
"AT*COMCFG=0,XXX"	CI_DEV_PRIM_GET_COM_CONFIG_REQ
"AT*COMCFG=1,XXX"	CI_DEV_PRIM_SET_COM_CONFIG_REQ
"AT*APCFG=	CI_PS_PRIM_SET_AP_UNIVERSAL_SETTING_REQ
"AT+VZWRSRP?"	CI_DEV_PRIM_GET_LTE_MEAS_REQ
"AT+VZWRSRQ?"	CI_DEV_PRIM_GET_LTE_MEAS_REQ
"AT*NASCHK=	CI_MM_PRIM_SET_NAS_INTEGRITY_CHECK_REQ
"AT*NASCHK?"	CI_MM_PRIM_GET_NAS_INTEGRITY_CHECK_REQ
"AT*GATR"	CI_SIM_PRIM_BTSP_TRANSFER_ATR_REQ
"AT+CNEM=	CI_MM_SET_NW_EMERGENCY_BEARER_SERVICES_REQ
"AT+CNEM?"	CI_MM_GET_NW_EMERGENCY_BEARER_SERVICES_REQ
"AT+CEN=	CI_MM_SET_EMERGENCY_NUMBER_REPORT_MODE_REQ
"AT+CEN?"	CI_MM_GET_EMERGENCY_NUMBER_REPORT_MODE_REQ
"AT+CISRVCC=	CI_MM_SET_SRVCC_SUPPORT_REQ
"AT+CISRVCC?"	CI_MM_GET_SRVCC_SUPPORT_REQ
"AT+CVDP=	CI_PS_PRIM_SET_VOICE_DOMAIN_PREFERENCE_REQ
"AT+CVDP?"	CI_PS_PRIM_GET_VOICE_DOMAIN_PREFERENCE_REQ
"AT+CEVDP=	CI_PS_PRIM_SET_VOICE_DOMAIN_PREFERENCE_REQ
"AT+CEVDP?"	CI_PS_PRIM_GET_VOICE_DOMAIN_PREFERENCE_REQ
"AT+CEUS=	CI_PS_PRIM_SET_EPS_USAGE_SETTING_REQ
"AT+CEUS?"	CI_PS_PRIM_GET_EPS_USAGE_SETTING_REQ
"AT+CAVIMS=	CI_PS_PRIM_SET_IMS_VOICE_CALL_AVAILABILITY_REQ
"AT+CAVIMS?"	CI_PS_PRIM_GET_IMS_VOICE_CALL_AVAILABILITY_REQ
"AT+CASIMS=	CI_PS_PRIM_SET_IMS_SMS_AVAILABILITY_REQ
"AT+CASIMS?"	CI_PS_PRIM_GET_IMS_SMS_AVAILABILITY_REQ
"AT+CMMIVT=	CI_PS_PRIM_SET_MM_IMS_VOICE_TERMINATION_REQ
"AT+CMMIVT?"	CI_PS_PRIM_GET_MM_IMS_VOICE_TERMINATION_REQ
"AT+CIREP=	CI_MM_SET_IMS_NW_REPORT_MODE_REQ
"AT+CIREP?"	CI_MM_GET_IMS_NW_REPORT_MODE_REQ
"AT+CSSAC"	CI_MM_GET_SSAC_STATUS_REQ
"AT*RFTEMP=	CI_DEV_PRIM_READ_RF_TEMPERATURE_REQ
"AT*RANDFILL=	CI_DEV_PRIM_SET_L2_RAND_FILL_ENABLED_REQ
"AT*RANDFILL?"	CI_DEV_PRIM_SET_L2_RAND_FILL_ENABLED_REQ
"AT*LTECOEX=	CI_DEV_PRIM_SET_LTE_COEX_REPORT_OPTION_REQ
"AT*LTECOEX?"	CI_DEV_PRIM_GET_LTE_COEX_INFO_REQ
"AT*CISCC=	CI_CC_PRIM_SRVCC_STATUS_REQ
"AT*CIIND=	CI_PS_PRIM_SET_IMS_REG_STATE_REQ
AT command Indications	
"CRING/RING"	CI_CC_PRIM_INCOMING_CALL_IND
"+CLCC"	CI_CC_PRIM_LIST_CURRENT_CALLS_IND
"+CSSI"	CI_CC_PRIM_SSI_NOTIFY_IND
"+CSSU"	CI_CC_PRIM_SSU_NOTIFY_IND
"+CHLD"	CI_CC_PRIM_HELD_CALL_IND
"+CCWA"	CI_CC_PRIM_CALL_WAITING_IND
"+CLIP"	CI_CC_PRIM_CLIP_INFO_IND
"+CNAP"	CI_CC_PRIM_CLIP_INFO_IND
"+COLP"	CI_CC_PRIM_COLP_INFO_IND

“+CCCM”	CI_CC_PRIM_CCM_UPDATE_IND
“+CREG”	CI_MM_PRIM_REGRESULT_IND
“*COPN”	CI_MM_PRIM_NITZ_INFO_IND
“+NITZ”	CI_MM_PRIM_NITZ_INFO_IND
“+CSQ”	CI_MM_PRIM_SIGQUALITY_INFO_IND
“^MODE”	CI_MM_PRIM_NETWORK_MODE_IND
“*BANDIND”	CI_MM_PRIM_BANDIND_IND
“+MSRI”	CI_MM_PRIM_SERVICE_RESTRICTIONS_IND
“*CellLock”	CI_MM_PRIM_CELL_LOCK_IND
“*REJCAUSE”	CI_MM_PRIM_AIR_INTERFACE_REJECT_CAUSE_IND
“+CUSD”	CI_SS_PRIM RECEIVED USSD_INFO_IND
“+LPLOC”	CI_SS_PRIM_LOCATION_IND
“+EEMGINFOBASIC”, “+EEMGINFOSVC”, “+EEMGINFOPS”, “+EEMGINFONC”, “+EEMGINBFTM”	CI_DEV_PRIM_GSM_ENGMODE_INFO_IND
“+EEMUMTSSVC”	CI_DEV_PRIM_UMTS_ENGMODE_SVCCELL_INFO_IND
“+EEMUMTSINTRA”	CI_DEV_PRIM_UMTS_ENGMODE_INTRAFREQ_INFO_IND
“+ EEMUMTSINTER”	CI_DEV_PRIM_UMTS_ENGMODE_INTERFREQ_INFO_IND
“+EEMUMTSINTERRAT”	CI_DEV_PRIM_UMTS_ENGMODE_INTERRAT_INFO_IND
“+EEMLTESVC”	CI_DEV_PRIM_LTE_ENGMODE_SVCCELL_INFO_IND
“+EEMLTEINTRA”	CI_DEV_PRIM_LTE_ENGMODE_INTRAFREQ_INFO_IND
“+EEMLTEINTER”	CI_DEV_PRIM_LTE_ENGMODE_INTERFREQ_INFO_IND
“+EEMLTEINTERRAT”	CI_DEV_PRIM_LTE_ENGMODE_INTERRAT_INFO_IND
“+LPNWDL”	CI_DEV_PRIM_LP_NWDL_MSG_IND
“+LPSTATE”	CI_DEV_PRIM_LP_RRC_STATE_IND
“+ LPMEAST”	CI_DEV_PRIM_LP_MEAS_TERMINATE_IND
“+LPRESET”	CI_DEV_PRIM_LP_RESET_STORED_UE_POS_IND
“*AMRCODEC”	CI_DEV_PRIM_CURRENT_AMR_CODEC_IND
“+MPBK”	CI_PB_PRIM_PHONEBOOK_READY_IND
“+CPIN”	CI_SIM_PRIM_DEVICE_IND
“+MSTK: 11”	CI_SIM_PRIM_PROACTIVE_CMD_IND
“+MSTK: 15”	CI_SIM_PRIM_SIMAT_CC_STATUS_IND
“+MSYK: 16”	CI_SIM_PRIM_SIMAT_SEND_CALL_SETUP_RSP_IND
“+MSTK: 20”	CI_SIM_PRIM_SIMAT_SEND_SS_USSD_RSP_IND
“+MSTK: 18”	CI_SIM_PRIM_SIMAT_SM_CONTROL_STATUS_IND
“+MSTK: 19”	CI_SIM_PRIM_SIMAT_SEND_SM_RSP_IND
“+MSTK: 12”	CI_SIM_PRIM_GET_CALL_SETUP_ACK_IND
“+MSTK: 13”	CI_SIM_PRIM_SIMAT_DISPLAY_INFO_IND
“+MSTK: 14”	CI_SIM_PRIM_ENDATSESSION_IND
“*EUICC”	CI_SIM_PRIM_CARD_IND
“+MMSG”	CI_MSG_PRIM_STORAGE_STATUS_IND
“+CMTI”	CI_MSG_PRIM_NEWSMSG_INDEX_IND
“+CMT/+CDS/+CBM”	CI_MSG_PRIM_NEWSMSG_IND
“+CGEV: EPS DED DEACT”	CI_PS_PRIM_PDP_CTX_DEACTED_IND
“+CGEV: ME DEACT”	
“+CGEV: EPS PDN DEACT”	
“+CGEV: ME PDN DEACT”	
“+CGEV: NW DEACT”	
“+CGREG”	CI_PS_PRIM_NW_REG_IND
“+CEREG”	CI_PS_PRIM_4G_NW_REG_IND
“+CGEV: NW DETACH”	CI_PS_PRIM_DETACHED_IND
“+CGEV: ME DETACH”	
“+CGEV: EPS DED ACT”	CI_PS_PRIM_MT_PDP_CTX_ACTED_IND

"+CGEV: ME ACT"	CI_PS_PRIM_MT_PDP_CTX_ACT MODIFY_IND
"+CGEV: EPS PDN ACT"	CI_DAT_PRIM_OK_IND
"+CGEV: ME PDN ACT"	CI_DAT_PRIM_NOK_IND
"+CGEV: NW ACT"	CI_MM_NW_EMERGENCY_BEARER_SERVICES_S1_IND
"+CGEV: EPS ACT"	CI_MM_NW_EMERGENCY_BEARER_SERVICES_IU_IND
"+CGEV: EPS MODIFY"	CI_MM_EMERGENCY_NUMBER_REPORT_IND
"CONNECT"	CI_MM_IMSVOPS_IND
"NO CARRIER"	CI_MM_SRVCC_HANDOVER_IND
"+CNEMS1"	CI_SIM_PRIM_ISIM_AID_IND
"+CNEMIU"	
"+CEN"	
"+CIREPI"	
"+CIREPH"	
"*ISIMAIID"	

Note1: If a request CCI primitive is “XXX_XXX_REQ”, then the confirm CCI primitive of this request is “XXX_XXX_CNF”.

Note2: If a single AT command mapping to multiple CCI primitives, the later request can be sent only after receive the success confirm of previous request.

Note3:[Tt] means this position can be character ‘T’ or character ‘t’ or nothing, so as [Ii] and [;].

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