Re-imagining Cellular IoT Solutions

Cavli C10QM Module

AT Command Manual

External Release Version 1.9

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Version History

Version	Description	Date
1.0	○ Initial Version	05-Sep-2023
1.1	○ Added Power Saving Commands	06-Oct-2023
1.2	○ Added RTC commands and additional GNSS commands	01-Nov-2023
1.3	○ Updated "Defined Values" of AT+GPSPORT	08-Dec-2023
1.4	○ Added AT+TCPFMT in TCP commands ○ Added MS Commands	07-Mar-2024
1.5	○ Removed several AT Commands	20-Mar-2024
1.6	○ Added examples for AT commands ○ Added additional GNSS, MQTT, USB commands ○ Added Qualcomm, Cavli proprietary commands ○ Removed several AT Commands	21-Aug-2024
1.7	○ Added AT Commands. ○ AT+CCOPS ○ AT+CMODEMINFO ○ AT$QCPDPP ○ AT+CPINR ○ AT+CACTBANDS ○ AT+CLBCFG ○ AT+CGBCFG	13-Dec-2024
1.8	○ Added AT Commands. ○ AT+CNVREAD ○ AT+CNVWRITE ○ AT+CGPSCFG ○ AT+THERMAL	22- Jan-2025
1.9	○ Added AT+USBPROF command	21-Mar-2025

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1 Summary

AT command interface, as shown in Figure 1-1:

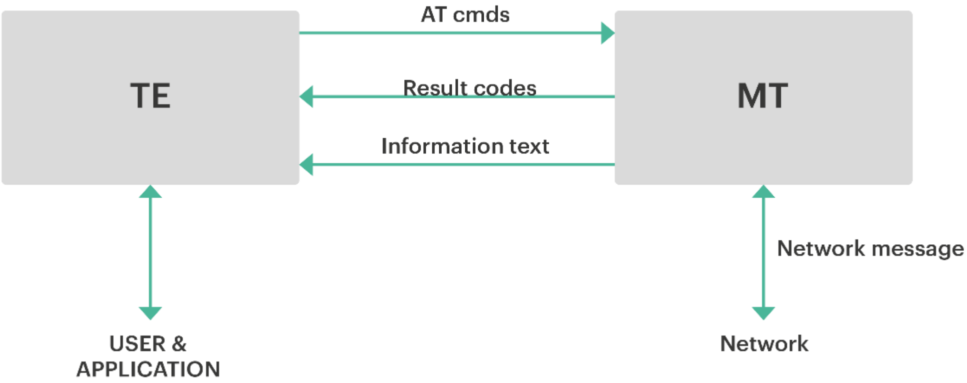

Figure 1. AT command interface

1.1 AT Command Syntax

- ✓ Optional parameters and required parameters must be arranged in accordance with the provisions of the order, the parameters must be separated by a comma. An example of this “AT+CPWD=<fac>, <oldpwd>, <newpwd>”, which is used to set a new password for facility lock.
- ✓ If the parameter is a string (such as <number>), the string must be placed in double quotes. For example, the string “1234” or “cmnet”. On the contrary, the symbols in double quotes can be seen as a string.
- ✓ Optional parameters or the optional part of the results return from TA should be in the square brackets.
- ✓ When you do not use double quotes, the spaces between the characters in the string are negligible.
- ✓ In actual use, we do not need to enter < >, [].
- ✓ All AT commands are not case sensitive, “AT” or “at” is fine.

1.2 AT Command Interface

Each interface requires functional cohesion.

Because the AT command is transmitted as data packets through communication port, the size of the package is limited.

Each command line can contain only one AT command. For the URC or response which MT initiates report to TE, each line also allows only one AT command. AT command end with a carriage return, and response and reporting end with linefeed.

To increase the readability and normative of the command and response format, in addition to the original standard protocol interface, all the other new interface parameters cannot contain spaces.

If TE wants to execute the second AT command, it must first wait for the response of the AT command from MT else the second AT command will not be executed.

To ensure all affairs without interference, it is suggested that report response results in asynchronous mode for the AT commands which require a longer time to respond. If MT takes a long time to respond to the TE, it may be a result of the response being interrupted by a URC. This interrupt contains two cases, one is that the URC report during the response process after the AT command executed, the response result will be report after the URC report. Another is that the URC report during the response process after the AT command executed, the AT command still to be executed and the response will be report with the URC report lead to two kinds of reports confusion. For the special URCs such as RING will use as a command terminator in some special cases, for example, the hang up command will be aborted if it has RING report in the process of hang up command.

The definition of string: up by double quotes, without quotes or comma byte stream.

The possible response from MT to TE consist of information text and result code, of which the information text is optional, and the result code is Compulsory. Possible response format control by ATV command.

1.3 AT Command Interface Standards

- The standard of add new interface.

Parameters can be added directly behind the original parameters of AT command, so in the late stage of product development if it is found that the interface cannot adapt to the new demand, it is only allowed add new parameters behind the original interface. Additional parameters should not affect the original function.

- The design principle of this product does not support function.

If the AT command from MT cannot recognize the current interface, the result of command not supported will be reported. If the parameters more than the original parameters, two report may be reported, the one is resulting code of too many parameters, another approach is fault-tolerant processing which not to judge the extra parameter.

2 Basic Commands

2.1 ATE

Description

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

Syntax

Command	Response
ATE0 Characters are not echoed	**Success**: OK **Fail:** ERROR
ATE1 Characters are echoed	**Success**: OK **Fail:** ERROR

2.2 ATI

Description

Request Device specific information

Syntax

Command	Response
ATI	**Success**: Manufacturer: Cavli Inc. Model Name: CXXXX Description: LTE Cat X Module

	Modem Version: X.X.X IMEI: 35xxxxxxxxxxxxx Serial Number: QABCDE000000 Hardware Version: CXXXX_V0(0000) Part Number: <Module_Part_number> SW Version: VX.X.X Build Date: <FW_Build_Date> OK **Fail:** ERROR

2.3 Unsolicited result code: *ATREADY

Description

AT URC to indicate that AT command server is ready to handler AT commands

Syntax

Command	Response
RDY +ATREADY	

2.4 ATZ

Description

This command restores the configuration profile.

Syntax

Command	Response
ATZ	**Success:** OK

	Fail: ERROR

2.5 AT&F

Description

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

Syntax

Command	Response
AT&F	**Success**: OK **Fail:** ERROR

3 Qualcomm commands

3.1 AT$QCRSRP

Description

This command is used to display neighbor cell information cell ID, EARFCN, RSRP

Syntax

Command	Response
AT$QCRSRP?	$ QCRSRP : <cell ID>,< EARFCN>,< RSRP> OK

Defined value

Parameter	Explain
<cell ID>	A unique identifier for a cell in a cellular network.
< EARFCN>	used to identify the carrier frequency, bandwidth, and duplex mode of the channel. 10-bit number that ranges from 0 to 65535
<RSRP>	RSRP measures the signal strength received by a device from a cell tower, indicating LTE network connection quality.

Example

```
AT$QCRSRP?

$QCRSRP: 469,38750,"-094.90"
```

3.2 AT$QCRSRQ

Description

This command is used to display neighbor cell info, Cell id, EARFCN, RSRQ

Syntax

Command	Response
AT$ QCRSRQ?	$ $QCRSRQ: < cell ID>,< EARFCN>,< RSRQ > OK

Defined value

Parameter	Explain
<cell ID>	A unique identifier for a cell in a cellular network.
< EARFCN>	used to identify the carrier frequency, bandwidth, and duplex mode of the channel. 10-bit number that ranges from 0 to 65535
< RSRQ >	RSRQ measures the quality of the LTE signal received by the modem, considering both signal strength and interference.

Example

```
AT$QCRSRQ?

$QCRSRQ: 469,38750,"-08.70"
```

3.3 AT$QCPDPP

Description

The execution command query APN authentication settings

Syntax

Command	Response
AT$QCPDPP= <cid>,<auth type>,<password>,<username>	**Success:** OK **Fail:**

	ERROR
AT$QCPDPP?	**Success:** $QCPDPP: <cid>,<authentication type>,<username> OK Note: if no authentication given response will not show username ($QCPDPP: 1,0) **Fail:** ERROR
AT$QCPDPP=?	**Success:** Test command to query supported configurations QCPDPP: (1-24),(0-3),, OK **Fail:** ERROR

Defined value

Parameter	Explain
<cid>:	1 to 24 Note: if no authentication given response will not show username ($QCPDPP: 1,0) <cid>- 1 to 24 Authentication type: 0- None 1- PAP 2- CHAP 3- PAP_CHAP

4 Cavli proprietary commands

4.1 AT+QCMAPEN

Description

This command is used to enable/disable the QCMAP function of the modem. Enabling this would restrict internet access to several modem functions including ATCMD.

Syntax

Command	Response
AT+QCMAPEN =[<n>]	**Success:** OK **Fail:** ERROR
AT+QCMAPEN?	+QCMAPEN: <n> OK
AT+QCMAPEN =?	+QCMAPEN: <QCMAP Enable(list of supported <n>s)> OK

Defined Value

Parameter	Explain
<n>	0: False 1: True

4.2 AT+GSM

Description

This command is used to enable/disable 2G functionality of the modem.
This command can allow the modem to be configured as either an LTE only device or LTE + 2G device.

Syntax

Command	Response
AT+GSM =[<n>]	**Success:** OK **Fail:** ERROR
AT+GSM?	+GSM: <n> OK
AT+GSM =?	+GSM: <GSM Enable(list of supported <n>s)> OK

Defined Value

Parameter	Explain
<n>	0: False <Disable 2G Functionality> 1: True <enable2G Functionality>

4.2 AT+THERMAL

Description

This command is used to obtain the thermal related parameters of the modem .

Syntax

Command	Response
AT+THERMAL	**Success:** nav-usr: <value> wddac-usr: <value> modem-dsp-usr: <value> ipss-usr: <value> cpuss-usr: <value> cpuss-step: <value>

	modem-dsp-step: <value> nav-lowf: <value> wddac-lowf: <value> modem-dsp-lowf: <value> ipss-lowf: <value> cpuss-lowf: <value> OK **Fail:** ERROR
AT+THERMAL=?	**Success:** +THERMAL OK **Fail:** ERROR

Defined Value

Parameter	Explain
<value>	Thermal Values

5 General Commands

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	Response
AT+CMEE=[<n>]	**Success:** OK **Fail:** ERROR
AT+CMEE?	+CMEE: <n> OK
AT+CMEE=?	+CMEE: (0,1,2) OK

Defined Value

Parameter	Explain
<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

5.2 AT+CGMI

Description

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

Syntax

Command	Response
AT+CGMI	Cavli Inc. OK
AT+CGMI=?	OK

5.3 AT+CGMM

Description

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

Syntax

Command	Response
AT+CGMM	<model> OK
AT+CGMM=?	OK

5.4 AT+CGMR

Description

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

Syntax

Command	Response
AT+CGMR	<firmware version> OK
AT+CGMR=?	OK

5.5 AT+CSCS

Description

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

Syntax

Command	Response
AT+CSCS=[<chset>]	**Success:** OK **Fail:** ERROR
AT+CSCS?	+CSCS: <chset> OK
AT+CSCS=?	+CSCS: ("IRA","GSM","UCS2") OK

Defined Value

Parameter	Explain
<chset>	“**IRA**” International reference alphabet “**UCS2**” 16-bit universal multiple-octet coded character set. “**GSM**” GSM 7-bit default Alphabet

5.6 AT+GMI

Description

Execution command causes the TA to return one or more lines of information text regarding manufacturer. Same function as **AT+CGMI**

Syntax

Command	Response
AT+GMI	Cavli Inc. OK
AT+GMI=?	OK

5.7 AT+GMM

Description

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

Same function as **AT+CGMM**

Syntax

Command	Response
AT+GMM	<model> OK
AT+GMM=?	OK

5.8 AT+GMR

Description

Execution command causes the TA to return one or more lines of information text regarding firmware version. Same as **AT+CMGR**

Syntax

Command	Response
AT+GMR	<firmware version> OK
AT+GMR=?	OK

5.9 AT+GSN or AT+CGSN

Description

This command returns the serial number or the IMEI of the device in use. Both **AT+GSN** and **AT+CGSN** have the same response and parameters. Both **AT+GSN=0** and AT+GSN=1 return the IMEI of the device

Syntax

Command	Response
AT+GSN=? Or	+GSN: (0,1)

AT+CGSN=?	OK or +CGSN: (0,1) OK
AT+GSN=0	+GSN: "<IMEI>" OK

5.10 AT+GCAP

Description

This command returns the equipment supported command set list

Syntax

Command	Response
AT+GCAP	+GCAP: +CGSM OK
AT+GCAP=?	OK

5.11 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	Response
AT+CCLK=<time>	**Success:** OK **Fail:** ERROR
AT+CCLK?	+CCLK: <time> OK/+CME ERROR: <err>
AT+CCLK=?	OK

Defined values

Parameter	Explain
<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"

5.12 AT+CBST

Description

This command is used to read or change the baud rate of AT port.

Syntax

Command	Response
AT+CBST=<baud rate>	**Success:** OK **Fail:** ERROR
AT+CBST=?	+CBST: (300,600,1200,2400,4800,9600,19200,38400,57600,115200) OK

Defined values

Parameter	Explain
<baud rate>	Rate of data transfer in serial communication

Example

```
AT+CBST=9600

OK
```

5.13 AT+CACTBANDS

Description

This command is used to Query currently active band.

Syntax

Command	Response
AT+CACTBANDS?	**Success:** +CACTBANDS: OK **Fail:** ERROR
AT+CACTBANDS=?	+CACTBANDS: <active rf band> OK

Example

```
AT+CACTBANDS?

B40
OK
```

5.14 AT+CLBCFG

Description

This command is used to lock specific LTE Band(s).

Syntax

Command	Response
AT+CLBCFG=<bands>	**Success:** OK **Fail:** ERROR
AT+CLBCFG?	**Success:** + CLBCFG: <bands>

	OK **Fail:** ERROR Note: Please refer to the example section for more details
AT+CLBCFG=?	**Success:** +CLBCFG: "<LTE_band_list(1,2,...,64)>" **Fail:** ERROR

Defined values

Parameter	Explain
<bands>	Select LTE band(s) to be locked . If multiple bands use this with comma separated.

Example

```
AT+CLBCFG?  //Before locking: This returns all available LTE bands from which you can lock specific band(s).

1,3,5,7,8,18,19,20,26,28,38,40,41
OK
AT+CLBCFG="1,3"   //Lock specific LTE band(s)
OK
AT+CLBCFG? //After locking: This returns only the locked bands
1,3
OK
```

5.15 AT+ CGBCFG

Description

This command is used to lock specific GSM Band(s).

Syntax

Command	Response
AT+ CGBCFG =<bands>	**Success:**

	OK **Fail:** ERROR **Example:** AT+CGBCFG="1,3" OK
AT+CGBCFG?	**Success:** + CGBCFG: <bands> OK **Fail:** ERROR
AT+CGBCFG=?	**Success:** +CGBCFG: "<GSM_band_list(1,2,...,64)>" **Fail:** ERROR

Defined values

Parameter	Explain
<bands>	Select GSM band(s) to be locked. If multiple bands use this with comma separated.

5.16 AT+USBPROF

Description

This command is used to configure usb_composition

Syntax

Command	Response
AT+ USBPROF=?	**Success:** +USBPROF: <pid>,[core (0:hsusb|1:hsic)],[set_as_default (0:no|1:yes)],[switch_immediately (0:no|1:yes)],[switch_from_adbd (0:no|1:yes)] supported pids:- 901D, 9021, 9022, 9024, 9025, 902B, 902D, 9039, 9049,

	904A, 9056, 9057, 9059, 905B, 9060, 9063, 9064, 9067, 9084, 9085, 9091, 90A1, 90A9, 90AD, 90B1, 90CA, 90CD, F000, empty OK **Fail:** ERROR

Defined values

Parameter	Explain
<pid>	901D - DIAG + ADB 9021 - DIAG + QMI_RMNET (Android) 9022 - DIAG + ADB + QMI_RMNET (Android) 9024 - RNDIS + ADB [Android] 9025 - DIAG + ADB + MODEM + NMEA + QMI_RMNET + Mass Storage (Android) + AT 902B - RNDIS + ADB + Mass Storage 902D - RNDIS + DIAG + ADB [Android] 9039 - MTP + ADB(Android) 9049 - DIAG + ADB + DUN + RMNET + Mass Storage + QDSS [Android] 904A - DIAG + QDSS [Android] 9056 - DIAG + ADB + SERIAL + RMNET + Mass Storage + Audio [Android] 9057 - RNDIS : ECM 9059 - DIAG+ADB+RNDIS : ECM 905B - MBIM 9060 - DIAG + QDSS + ADB 9063 - RNDIS : ECM : MBIM 9064 - DIAG + ADB + MODEM + QMI_RMNET : ECM : MBIM 9067 - Mass storage + QMI_RMNET : Mass Storage + MBIM 9084 - DIAG + QDSS + ADB + RMNET 9085 - DIAG+ADB+MBIM+GNSS 9091 - DIAG + MODEM + QMI_RMNET + ADB

	90A1 - DIAG + ADB + (multiplexed) QMI_RMNET (Android) 90A9 - DIAG + ADB + MODEM + NMEA + QDSS (bulk in) + RMNET : ECM : MBIM 90AD - DIAG + ADB + MODEM + NMEA + QMI_RMNET + Mass Storage + DPL 90B1 - ECM 90CA - DIAG + ADB + UAC2 90CD - DIAG + ADB + GNSS F000 - Mass Storage

6 Call Control Commands*

** Under development. Current Call functions over 2G supported*

6.1 ATD

Description

This command causes the MT to transition from the command state to the online state. Execution command starts a call to a phone number. If “;” is given

ATD*99# can be used for PPP dialup function

Syntax

Command	Response
ATD<dial string>;	**Success:** OK **Fail:** ERROR
ATD*99#	

Example

```
ATD0123456789;

OK
```

6.2 ATA

Description

Execution command is used to answer to an incoming call if automatic answer is disabled.

Syntax

Command	Response
ATA	**Success:** OK **Fail:** ERROR

6.3 ATH

Description

Execution command is used to close the current conversation (voice, data or fax).

Syntax

Command	Response
ATH[<value>]	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<value>	0: Disconnect from line and terminate call.

6.4 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	Response
AT+CVHU=<mode>	**Success:** OK **Fail:** ERROR Note: <mode> is 0, 1 or 2 will return "OK", other parameters will return an error
AT+CVHU?	**Success:** AT+CVHU: <mode> OK **Fail:** ERROR
AT+CVHU=?	**Success:** AT+CVHU:(0-1) OK **Fail:** ERROR

Defined Value

Parameter	Explain
<mode>	0: "Drop DTR" ignored but OK response given. ATH disconnects. 1: "Drop DTR" and ATH ignored but OK response given. 2: "Drop DTR" behavior according to &D setting. ATH disconnects.

6.5 AT+CRLP

Description

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

Syntax

Command	Response
AT+CRLP=<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]]	**Success:** OK **Fail:** ERROR
AT+CRLP?	**Success:** AT+CRLP:<iws>,<mws>,<T1>,<N2>[,<ver1>[,<T4 >]] OK or AT+CRLP:<iws>,<mws>,<T1>,<N2>[,<ver2>[,<T4 >]] [...]] OK **Fail:** ERROR Example: AT+CRLP:61,61,128,6,1,3 OK
AT+CRLP=?	**Success:** +CRLP: (0-61),(0-61),(38-255),(1-255),0 +CRLP: (0-61),(0-61),(38-255),(1-255),1 +CRLP: (0-488),(0-488),(42-255),(1-255),2 OK **Fail:**

	ERROR

Defined Value

Parameter	Explain
<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

6.6 AT+CHUP

Description

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

Syntax

Command	Response
AT+CHUP	**Success:** OK **Fail:** ERROR
AT+CHUP=?	OK

6.7 AT+CSTA

Description

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

Syntax

Command	Response
AT+CSTA=[<type>]	**Success:** OK **Fail:** ERROR
AT+CSTA?	**Success:** AT+CSTA: <type> OK **Fail:** ERROR Example: AT+CSTA:129 OK
AT+CSTA=?	**Success:** +CSTA: (129,145) OK **Fail:** ERROR

Defined value

Parameter	Explain
<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

6.8 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	Response
AT+CRC=[<mode>]	**Success:** OK When enabled extended format, there will be unsolicited code AT+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 **Fail:** ERROR
AT+CRC?	AT+CRC: <mode> OK Example: AT+CRC: 0 OK
AT+CRC=?	AT+CRC: (0,1) OK

Defined value

Parameter	Explain
<mode>	0: disables extended format 1: enables extended format

6.9 AT+DS

Description

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

Syntax

Command	Response
AT+DS=[<direction>[,<compression_negotiation>[,<max_dict>[,<max_string>]]]] Notes:	**Success:** OK **Fail:** ERROR
+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

Defined value

Parameter	Explain
<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.

6.10 AT+CEER

Description

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

Syntax

Command	Response
AT+CEER	+CEER: <report> OK
AT+CEER=?	OK

7 Network Service Commands

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	Response
AT+CREG?	**+CREG: <n>,<stat>** **Success:** +CREG=0,1/5 (Default) OK **Fail:** +CREG=2
AT+CREG=<n>	**Success:** OK **Fail** ERROR
AT+CREG=?	+CREG: (0-2) OK

Defined Values

Parameter	Definition
<n>	0: disable network registration unsolicited result code

	1: enable network registration unsolicited result code 2: enable network registration and location information unsolicited result code 3: enable network registration, location information and cause value information unsolicited result code
<stat>	0: not registered, MT is not currently searching a new operator to register to 1: registered, home network 2: not registered, but MT is currently searching a new operator to register to 3: registration denied 4: unknown 5: registered, roaming 6: registered for "SMS only", home network (applicable only when

7.2 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	Response
AT+COPS?	**Success:** +COPS: <mode>[,<format>,<oper>[,< AcT>]] **Fail:** ERROR
AT+COPS=<mode>[,<format>[,<oper>[,< AcT>]]]	**Success:** +COPS: (<sl.no>, <operator info>, <operator>, <operator code> ,<act>),...,.... OK **Fail:** ERROR

AT+COPS=?	**Success:** +COPS: [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 **Fail:** ERROR

Defined Value

Parameter	Explain
<mode>	0 – Automatic network selection 1 – Manual network selection 3 – Set <format> of +COPS read command response
<format>	0 – Long alphanumeric <oper> format. Only for <mode>3. 1 – Short alphanumeric <oper> format. Only for <mode>3. 2 – Numeric <oper> format
<oper>	String of digits. Mobile Country Code (MCC) and Mobile Network Code (MNC) values. For manual selection, only the numeric string format is supported and <oper> is mandatory.
<AcT>	Access Technology selected: 0: GSM 1: GSM Compact 2: UTRAN 3: GSM EGPRS 4: UTRAN HSDPA 5: UTRAN HSUPA 6: UTRAN HSPA 7: EUTRAN

	8: UTRAN w/HSPA+ 9: E-UTRAN CA
<stat>	Integer Type 0 unknown 1 available 2 current 3 forbidden

Example

```
AT+COPS=1,2,"405864",7
OK
AT+COPS: (1, "CHN-UNICOM",
"UNICOM", "46001", 2),,(0,1,2,3,4),
(0,1,2)
OK
```

7.3 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	Response
AT+CGACT?	**Success:** +CGACT: <cid>, <state> OK **Fail:** ERROR
AT+CGACT=?	+CGACT: (0,1)

	OK

7.4 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	Response
AT+CGATT= <state> Note: <state>: indicates the state of PS attachment 0 - detached 1 - attached	**Success:** OK **Fail:** ERROR
AT+CGATT?	+CGATT: <state> OK Example +CGATT: 1 OK
AT+CGATT=?	+CGATT: (0,1) OK

7.5 AT+CFUN

Description

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

Syntax

Command	Response
AT+CFUN=[<fun>[,<rst>]] Note: <fun>: 0: minimum functionality 1: full functionality <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	**Success:** OK **Fail:** ERROR
AT+CFUN?	**Success:** +CFUN: <fun> OK **Fail:** ERROR **Example:** +CFUN: 1 OK
AT+CFUN=?	+CFUN: (0-1),(0-1) OK

7.6 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	Response
AT+CSQ	**Success:** +CSQ: <rssi>,<ber> OK **Fail:** ERROR Example: +CSQ:3,0 OK Note: this can also be an unsolicited result code to indicate signal quality.
AT+CSQ=?	+CSQ: (0-31),(0-7) OK

Defined values

Parameter	Explain
<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

NOTE

- RSSI , RSRP can be obtained by using AT+RSSI , AT+RSRB

7.7 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	Response
AT+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_cause>]] <stat>: EPS registration status 0: not registered, MT is not currently searching an operator to register to 1: registered, home network 2: not registered, but MT is currently trying to attach or searching an operator to register to 3: registration denied 4: unknown 5: registered, roaming 6: registered for "SMS only", home network (not applicable) 7: registered for "SMS only", roaming (not	**Success:** OK **Fail:** ERROR

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	
AT+CEREG?	**Success:** +CEREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>] [,<cause_type>,<reject_cause >]] OK **Fail:**

	ERROR
AT+CEREG=?	+CEREG: (range of supported <n>s) OK

7.8 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	Response
+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:	**Success:** OK **Fail:** ERROR

<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]]	
+CGREG?	**Success:** +CGREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]] OK **Fail:** ERROR **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

7.9 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	Response
AT+CIND?	+CIND: <signal>,<service> OK Example: +CIND: 0,2,1,1,0,0,1,0 OK

AT+CIND=?	+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0-1)),("call",(0-1)),("roam",(0-1)),("smsfull",(0-1)),("GPRS coverage",(0-1)),("callsetup",(0-3)) OK

7.10 AT+CLCK

Description

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

Syntax

Command	Response
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	**Success:** OK **Fail:** ERROR **Note:** when <mode>=2 and command successful: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]]
AT+CLCK=?	+CLCK:("AB","AC","AG","AI","AO","IR","OI","OX","SC","FD","PN","PU","PP","PC","PF") OK

Defined value

Parameter	Explain
<fac>	"SC" - SIM (PIN request) (device asks SIM password at power-up and when this lock command issued) "AO"- BAOC (Barr All Outgoing Calls) "OI" - BOIC (Barr Outgoing International Calls)

	"OX" - BOIC-exHC (Barr Outgoing International Calls except to Home Country) "AI" - BAIC (Barr All Incoming Calls) "IR" - BIC-Roam (Barr Incoming Calls when Roaming outside the home "AB" - All Barring services (applicable only for <mode>=0) "AG" - All outGoing barring services (applicable only for <mode>=0) "AC" - All inComing barring services (applicable only for <mode>=0) "FD" - SIM fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) "PN" - network Personalisation "PU" - network subset Personalisation
<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>	It 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

7.11 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	Response
AT+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>	**Success:** OK **Fail:** ERROR
AT+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s OK

7.12 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	Response
AT+CLIP=<n> Note: <n> (parameter sets/shows the result code presentation status to the TE): 0: disable	**Success:** OK **Fail:** ERROR When the presentation of the CLI at the TE is enabled (and calling

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.)	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
AT+CLIP?	+CLIP: <n>,<m> OK/+CME ERROR: <err>
AT+CLIP=?	+CLIP: (0-1) OK

7.13 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	Response
AT+CPLS=[<list>]	**Success:** OK **Fail:** ERROR
AT+CPLS?	**Success:** +CPLS: <list> OK **Fail:** ERROR **Example:** +CPLS: 0

	OK
AT+CPLS=?	+CPLS: 0,1,2 OK

Defined values

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

7.14 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	Response
AT+COPN	**Success:** +COPN: <numeric>,<alpha> OK **Fail:** ERROR
AT+COPN=?	OK

Defined values

Parameter	Explain

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

7.15 AT+CTZR

Description

Read command returns the current settings in the MT. Test command returns supported on- and off-values.

Syntax

Command	Response
AT+CTZR?	**Success:** +CTZR: 1 OK **Fail:** ERROR Note: 1, enable
AT+CTZR=?	+CTZR: (0-1) OK

7.16 AT+CTZU

Description

Read command returns the current settings in the MT.
Test command returns supported on- and off-values.

Syntax

Command	Response
AT+CTZU?	+CTZU: 1 OK Note: 1, enable
AT+CTZU=?	+CTZU:(0-1) OK

7.17 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	Response
AT+WS46=[<n>]	**Success:** OK **Fail:** ERROR
AT+WS46?	**Success:** +WS46: <n> OK **Fail:** ERROR
AT+WS46=?	(list of supported <n>s)

Defined value

Parameter	Explain
<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.

7.18 AT+PING

Description

This command is used to test whether a particular host is accessible across an IP network.

Syntax

Command	Response
AT+PING=<"remote_address">[,<timeout> [,<packet_length> [,<ping_count (1~65535)>]]]	**Success:** Reply from <*ip_address*>: bytes=<*bytes*> time =<*time*>(ms), TTL=<*ttl*> Reply from <*ip_address*>: bytes=<*bytes*> time =<*time*>(ms), TTL=<*ttl*> Reply from <*ip_address*>: bytes=<*bytes*> time =<*time*>(ms), TTL=<*ttl*> Reply from <*ip_address*>: bytes=<*bytes*> time =<*time*>(ms), TTL=<*ttl*> Reply from <*ip_address*>: bytes=<*bytes*> time =<*time*>(ms), TTL=<*ttl*> Ping statistics for <*ip_address*> Packets: Sent = <*n_s*>, Received =<*n_r*>, Loss =<*loss*> ,<*loss%*>, Max =<*max_time*> ms, Min = <*min_time*> ms, Avg =<*avg_time*> ms **Fail:** ERROR
AT+PING=?	+PING: <"remote_address"> [, <timeout (1~255)> [, <packet_length (ipv4 36~1500 | ipv6 56~1500)> [, <ping_count (1~65535)>]]]

Defined value

Parameter	Explain
<remote_address>	Remote IP address/url of the server

<timeout>	Ping timeout (in seconds): **1~255**
<packet_length>	Packet length for ipv4: **36~1500** Packet Length for ipv6: **56~1500**
<ping_count>	Count value ranges from **1~65535**
<ip_address>	IP address
<bytes>	Packet data size
<time>	Time taken to send and receive packet
<ttl>	Time To Live (Time for which the packet should exist on a network)
<n_s>	No. of times packets are sent
<n_r>	No. of times packets are received successfully
<loss>	No. of packets failed to deliver
<loss%>	Percentage of loss
<max_time>	Maximum time for a handshake
<min_time>	Minimum time for handshake
<avg_time>	Average time for handshake

7.19 AT+PINGSTOP

Description

This command is used to kill the ongoing ping process.

Syntax

Command	Response
AT+PINGSTOP	**Success:** OK **Fail:** ERROR
AT+PINGSTOP=?	+PINGSTOP OK

7.20 AT+CCOPS

Description

This Command is used to query the current operator's name and operator code simultaneously

Syntax

Command	Response
AT+CCOPS?	**Success:** +CCOPS: <mode>, <operator name>, <operator code>,<RAT> **Fail:** ERROR
AT+CCOPS=?	**Success:** +CCOPS OK

7.21 AT+CMODEMINFO

Description

This command Returns serving cell information in a single response

Syntax

Command	Response
AT+CMODEMINFO?	**Success:** Example: Opert Mode: ONLINE Current Time: 24/12/03,07:52:04 System RAT: LTE PS State: ATTACHED CS State: ATTACHED NAS State: REGISTERED Band: B40 Bandwidth: 20 MHz IMS Reg State: IMS Srv State: NO SMS, NO VoIP Cell ID: 23256****

	LAC: 66534 TAC: 3024 RSRP: -101 RSSI:-72 RSRQ: -10 SNR: 8.4 RRC State: UNKNOWN OK **Fail:** ERROR
AT+ =?	**Success:** +CMODEMINFO OK

Parameter Description

Parameter	Description
Opert Mode	Indicates whether the device is in online or offline mode
Current Time	Displays the current time and date
System RAT	Specifies the current Radio Access Technology
PS State	Shows the status of the Packet Switched (PS) domain (e.g., ATTACHED, DETACHED)
CS State	Shows the status of the Circuit Switched (CS) domain (e.g., ATTACHED, DETACHED)
NAS State	Indicates the status of the Network Access Layer (NAS) (e.g., REGISTERED, NOT REGISTERED)
Band	Current Active band
Bandwidth	Indicates the bandwidth allocated
IMS Reg State	Shows the registration status of the device with the IP Multimedia Subsystem (IMS)
IMS Srv State	Indicates the availability of IMS services (e.g., SMS, VoIP)

Cell ID	Identifies the specific cell tower the device is connected to
LAC	Identifies the Location Area Code of the cell tower
TAC	Identifies the Tracking Area Code of the cell tower
RSRP	Reference Signal Received Power
RSSI	strength of the received signal
RSRQ	quality of the received signal
SNR	Signal-to-Noise Ratio of the received signal
RRC State	Indicates the Radio Resource Control (RRC) state of the device

8 Mobile Control and Status Commands

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	Response
AT+CPAS	**Success:** +CPAS: <pas> OK **Fail:** ERROR **Example:** +CPAS: 4 OK
AT+CPAS=?	+CPAS: (0,3,4) OK

Defined value

Parameter	Explain
<pas>:	0 ready (MT allows commands from TA/TE) 1 unavailable (MT does not allow commands from TA/TE) 3 ringing (MT is ready for commands from TA/TE, but the ringer is active) 4 calls in progress (MT is ready for commands from TA/TE, but a call is in progress)

8.2 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	Response
AT+CPBS=<storage>[,<password>]	**Success:** OK **Fail:** ERROR
AT+CPBS?	**Success:** +CPBS: <storage>,<used>,<total> OK **Fail:** ERROR **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
AT+CPBS=?	+CPBS: ("SM","DC","MC","ME","RC","EN") OK

Defined value

Parameter	Explain
<storage>	values reserved by the present document: "SM" SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the EFADN under DFTelecom is selected. If a UICC with an active USIM application is present, the global phonebook, DFPHONEBOOK under DFTelecom is selected. "DC" MT dialled calls list (+CPBW may not be applicable for this storage) "MC" MT missed (unanswered received) calls list (+CPBW may not be applicable for this storage) "ME" MT phonebook "RC" MT received 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)

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

8.4 AT+TRB

Description

This command is used to restart/reboot the module.

Syntax

Command	Response
AT+TRB	REBOOTING

NOTE

- Only functional on modem firmware versions 2.0.1 and above.

9 Packet domain Commands

9.1 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	Response
AT+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 AT+CGDSCONT commands). Example: AT+CGDATA=”PPP”,1 AT+CGDATA=””,1	CONNECT/ERROR
AT+CGDATA=?	+CGDATA: (“”), (1-8) OK

9.2 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	Response
AT+CGDCONT=<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<ipAddrAlloc> [,<request_type > [,<pCscfDiscovery> [,<imCnSignallingFlagInd>]]]]]]]]]	**Success:** OK **Fail:** ERROR
AT+CGDCONT?	**Success:** [+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 **Fail:** ERROR
AT+CGDCONT=?	+CGDCONT: (1-24),"IP",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"IPV6",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1)

	OK

Defined value

Parameter	Explain
<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 26.323) 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 Ipv4 address allocation through NAS signaling 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 24.401 [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

NOTE

- During initialization this is already set, Hence the initialization steps for CGDCONT need not be done

9.3 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	Response
AT+CGDSCONT=<cid> [,<p_cid> [,<d_comp> [,<h_comp> [,<	**Success:** OK

imCnSignallingFlagInd>]]]]	**Fail:** ERROR
AT+CGDSCONT?	**Success:** [+CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp>, < imCnSignallingFlagInd> [<CR><LF>+CGDSCONT: <cid>, <p_cid>, <d_comp>, <h_comp>, < imCnSignallingFlagInd> [...]]] OK **Fail:** ERROR
AT+CGDSCONT=?	+CGDSCONT: (1-24),(),"IP",(0-2),(0-4) +CGDSCONT: (1-24),(),"PPP",(0-2),(0-4) +CGDSCONT: (1-24),(),"IPV6",(0-2),(0-4) +CGDSCONT: (1-24),(),"IPV4V6",(0-2),(0-4) OK

Defined value

Parameter	Explain
<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 26.323) 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

9.4 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	Response
AT+CGQREQ=<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]	**Success:** OK **Fail:** ERROR

AT+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
AT+CGQREQ=?	+CGQREQ: "IP",(0-4),(0-3),(0-5),(0-9),(0-18,31) OK

9.5 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	Response
AT+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>]]]]]]]]	**Success:** OK **Fail:** ERROR
AT+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
AT+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

9.6 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 UTMS/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	Response
AT+CGEQOS=<cid> [,<QCI> [,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR]]]	**Success:** OK **Fail:** ERROR
AT+CGEQOS?	**Success:** +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 **Fail:**

	ERROR
AT+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 value

Parameter	Explain
<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 24.203 [85]) 0 QCI is selected by network [1 – 4] value range for guranteed bit rate Traffic Flows [5 – 9] value range for non-guarenteed 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])

9.7 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>,<PCSCF_prim_addr>,<PCSCF_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	Response
AT+CGCONTRDP=[<cid>]	**Success:** +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 **Fail:** ERROR
AT+CGCONTRDP=?	+CGCONTRDP: (list of <cid>s associated with active contexts) OK

Defined value

Parameter	Explain
<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.m 9.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

9.8 AT+CGSCONTRDP

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	Response
AT+CGSCONTRDP=[<cid>]	**Success:** +CGSCONTRDP: <cid>, <p_cid>, <bearer_id> [<CR><LF>+CGSCONTRDP: <cid>, <p_cid>, <bearer_id> […]] OK **Fail:** ERROR
AT+CGSCONTRDP=?	OK

9.9 AT+CGTFTRDP

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	Response
AT+CGTFTRDP=[<cid>]	**Success:** +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 **Fail:** ERROR
AT+CGTFTRDP=?	+CGTFTRDP: (list of <cid>s associated with active contexts) OK

Defined value

Parameter	Explain
<cid>:	a numeric parameter which specifies a particular PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).
<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.m 9.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 FFFFF. 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)

9.10 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	Response
AT+CEMODE= [<mode>]	**Success:** OK **Fail:** ERROR
AT+CEMODE?	**Success:** +CEMODE: <mode> OK **Fail:** ERROR
AT+CEMODE=?	+CEMODE: (list of supported <mode>s) OK

Defined value

Parameter	Explain
<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

9.11 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	Response
AT+CGPADDR=[<cid> [,<cid> [,...]]]	**Success:** +CGPADDR: <cid>,<PDP_addr_1> [,<PDP_addr_2>] [<CR><LF><cid>,<PDP_addr_1> [,<PDP_addr_2>] [...]] OK **Fail:** ERROR
AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK

Defined value

Parameter	Explain
<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.

10 NV Commands

10.1 AT+CNVREAD

Description

The command is used to read Non-Volatile (NV) parameters from the device's memory.

Syntax

Command	Response
AT+CNVREAD=<nv_number>,<nv_size>	+CNVREAD: <nv_ID> OK
AT+CNVREAD=?	+CNVREAD: <nv_number>, <nv_size> OK

10.2 AT+CNVWRITE

Description

The command is used to Write into the Non-Volatile (NV) parameters from the device's memory.

Syntax

Command	Response
AT+CNVWRITE=<nv_number>,<hex_value>	OK
AT+CNVWRITE=?	+CNVWRITE: <nv_number>,<hex_value> OK

11 SIM Commands

11.1 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	Response
+CIMI	<IMSI> OK

11.2 AT+ICCID

Description

This command reads the ICCID number in SIM Card

Syntax

Command	Response
AT+ICCID	+ICCID: <iccid> OK

Defined values

Parameter	Explain
<iccid>	ICCID number

11.3 AT^SIMSWAP

Description

This command is used to select between external and internal SIM Cards.

Syntax

Command	Response
AT^SIMSWAP=?	^SIMSWAP: (0,1)
AT^SIMSWAP=<n>	OK

Defined value

Parameter	Explain
<n>	1 // External SIM Card 0 // Internal SIM Card (eSIM)

11.4 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	Response
AT+CNUM	**Success:** +CNUM: [<alpha1>],<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[,<speed>,<service> [,<itc>]] [...]] OK **Fail:** ERROR
AT+CNUM=?	OK

Defined values

Parameter	Explain
<alphax>:	optional alphanumeric string associated with <numberx>; used character set should be the one selected with command Select TE Character Set +CSCS
<numberx>:	string type phone number of format specified by <typex>

<typex>:	type of address octet in integer format (refer TS 24.008 subclause 11.5.4.7)
<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 1 UDI

NOTE

- The AT+CNUM command is used to retrieve the MSISDN from a modem. This command can only display the phone number if it is already stored on the SIM card.

11.5 AT+CRSM

COMMAND	I NS	P1	P2	P 3	S/R
SELECT	'A4'	'00'	'00'	'02'	S/R
STATUS	'F2'	'00'	'00'	lgth	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

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	Response
AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	**Success:** +CRSM: <sw1>,<sw2>[,<response>] OK **Fail:** ERROR
AT+CRSM=?	+CRSM:

	(176,178,192,214,220,242),(12037-28599),(0-255),(0-255),(0-255),<data>,<pathid> OK

Defined value

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

```
AT+CRSM=176,28423,0,0,9
+CRSM: 144,0,084906005743219944
AT+CRSM=192,28484
+CRSM: 144,0,000001186F44044011FF440102031C        // generic success code, 0000-> RFU
AT+CRSM=178,28484,0,4,28
+CRSM: 144,0,FFFFFFFFFFFFFFFFFFFFFFFFFFF04810180F6FFFFFFFFFFFFFFFFFF
// FFFFFFFFFFFFFFFFFFFFFFFFFFF
```

11.6 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	Response
AT+CPIN=<pin>[,<newpin>]	**Success:** OK **Fail:** ERROR
AT+CPIN?	**Success:** +CPIN: <code>(Note) OK **Fail:** ERROR

	Example: +CPIN: READY OK Note: +CPIN: <code> can also be unsolicited result code sent from MT to TE when current SIM status changed.
AT+CPIN=?	OK

Defined value

Parameter	Explain
<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

11.7 AT+CPINR

Description

Set command reads the remaining SIM PIN/PUK attempts

Syntax

Command	Response
AT+CPINR=?	**Success:** +CPINR OK **Fail:** ERROR
AT+CPINR?	**Success:** Example: +CPINR: SIM PIN1,3,10 +CPINR: SIM PUK1,10,10 +CPINR: SIM PIN2,3,10 +CPINR: SIM PUK2,10,10 OK **Fail:** ERROR

Example/Note

+CPINR: SIM PIN1,3,10

3- The number of remaining attempts to enter the correct SIM PIN1 before the SIM is locked.

10- The total number of allowed attempts for entering SIM PIN1
+CPINR: SIM PUK1,10,10
10- The number of remaining attempts to enter the correct SIM PUK1 before the SIM becomes permanently locked. 10- The total number of allowed attempts for entering SIM PUK1.

11.8 AT+CSIM

Description

Set command transmits to MT the SIM command it then shall send as it is to the SIM. This command allows direct control of the SIM by a distant application on the TE. TE shall then take care of processing SIM information within the frame specified by GSM/UMTS.

Syntax

Command	Response
AT+CSIM=<length>, <command>	**Success:** +CSIM: <length>,<response> OK **Fail:** ERROR
AT+CSIM=?	OK

Defined value

Parameter	Explain
<length>:	integer type; length of the characters that are sent to TE in <command> o <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: The response APDU has the following general format:

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 bytes data transfer from the SIM in an outgoing data transfer command (response direction). In an ingoing 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

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:48,000000003F0001000000000000993010204000838A838A9000 //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 EFIMSI 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:22,084906005743219944900
```

11.9 AT+CMGS

Description

Execution command sends message from a TE to the network (SMS-SUBMIT).

Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

Syntax

Command	Response
If text mode (AT+CMGF=1): **AT+CMGS=<da>[,<toda>]<CR>** **Text is entered<ctrl-Z/ESC>** If PDU mode (+CMGF=0): **AT+CMGS=<length><CR>** **PDU is given<ctrl-Z/ESC>**	Success: +CMGS: <mr> OK Fail: ERROR If PDU mode (+CMGF=0) Success: +CMGS: <mr>[,<ackpdu>] Fail: ERROR
AT+CMGS=?	OK

Defined value

Parameter	Explain
<da>	In text mode (AT+CMGF=1)
	Destination address
<toda>	Type of destination address
<mr>	3GPP TS 23.040 [3] TP-Message-Reference in integer format.
<length>	Indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded)

12 MS Commands

** Under development. Current Call functions over 2G supported*

12.1 AT+CMGS

Description

Execution command sends message from a TE to the network (SMS-SUBMIT).

Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

Syntax

Command	Response
If text mode (AT+CMGF=1): **AT+CMGS=<da>[,<toda>]<CR>** **Text is entered<ctrl-Z/ESC>** If PDU mode (+CMGF=0): **AT+CMGS=<length><CR>** **PDU is given<ctrl-Z/ESC>**	Success: +CMGS: <mr> OK Fail: ERROR If PDU mode (+CMGF=0) Success: +CMGS: <mr>[,<ackpdu>] Fail: ERROR
AT+CMGS=?	OK

Defined value

Parameter	Explain
<da>	In text mode (AT+CMGF=1) Destination address
<toda>	Type of destination address
<mr>	3GPP TS 23.040 [3] TP-Message-Reference in integer format.
<length>	Indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded)

12.2 AT+CMGR

Description

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

Syntax

Command	Response
AT+CMGR=<index>	**Success:** **if text mode (+CMGF=1),for SMS- DELIVER**: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>] <CR><LF><data> **if text mode (+CMGF=1),for SMS- SUBMIT**: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,< pid>,<dcs>,[<vp>], <sca>,<tosca>,<length>] <CR><LF><data> **if text mode (+CMGF=1), for SMS- STATUS-REPORT** (current not supported): +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<sc ts>,<dt>,<st> **if text mode (+CMGF=1), for SMS- COMMAND** (current not supported): +CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length> <CR><LF><cdata>]

	if text mode (+CMGF=1),for CBM storage(current not supported): +CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<page s><CR><LF><data> **if PDU mode (+CMGF=0)**: +CMGR: <stat>,[<alpha>],<length><CR><LF><pd u> **Fail:** ERROR
AT+CMGR=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<index>	The value is the range of location number supported by the associated memory
<stat>	in PDU mode (default 0), or in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:
	0 or "REC UNREAD" received unread message (i.e. new message)
	1 or "REC READ" received read message
	2 or "STO UNSENT" stored unsent message (only applicable to SMS)
	3 or "STO SENT" stored sent message (only applicable to SMs)
<alpha>	The alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007 [9]).
<da>	Destination address, 3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <toda>.
<oa>	Originating address, 3GPP TS 23.040 [3] TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <tooa>.
<dt>	3GPP TS 23.040 [3] TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds, and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"
<scts>	3GPP TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer

	<dt>).
<fo>	Frist Octet, depending on the command or result code: first octet of 3GPP TS 23.040 [3] SMS-DELIVER, SMSSUBMIT (default 33), SMS-STATUS-REPORT, or SMS-COMMAND in integer format
<pid>	Protocol identifier. 3GPP TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)
<dcs>	Data Coding Scheme, depending on the command or result code: 3GPP TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format
<vp>	Depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040 [3] TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)
<mn>	3GPP TS 23.040 [3] TP-Message-Number in integer format
<mr>	3GPP TS 23.040 [3] TP-Message-Reference in integer format
<ra>	3GPP TS 23.040 [3] TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set(refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <tora>
<toda>	3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<tora>	3GPP TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<tooa>	3GPP TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<sca>	3GPP TS 24.011 [6] 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 (refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <tosca>
<tosca>	3GPP TS 24.011 [6] RP SC address Type-of-Address octet in integer format (default refer <toda>)
<length>	The value indicating in the text mode (+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length)
<data>	In the case of SMS: 3GPP TS 23.040 [3] TP-User-Data in text mode responses;
<pdu>	In the case of SMS: 3GPP TS 24.011 [6] SC address followed by 3GPP TS 23.040

	[3] TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))
<sn>	3GPP TS 23.041 [4] CBM Serial Number in integer format
<st>	3GPP TS 23.040 [3] TP-Status in integer format
<mid>	3GPP TS 23.041 [4] CBM Message Identifier in integer format
<page>	3GPP TS 23.041 [4] CBM Page Parameter bits 4-7 in integer format
<pages>	3GPP TS 23.041 [4] CBM Page Parameter bits 0-3 in integer format

12.3 AT+CMGF

Description

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters).

Test command returns supported modes as a compound value.

Syntax

Command	Response
AT+CMGF=<mode>	**Success:** OK **Fail** ERROR
AT+CMGF?	**Success:** +CMGF: <mode> **Fail:** ERROR
AT+CMGF=?	**Success:** +CMGF: (list of supported <mode>s) **Fail:** ERROR

Defined value

Parameter	Explain
<mode>	**0** PDU mode **1** Text mode

12.4 AT+CMGL

Description

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

Syntax

Command	Response
AT+CMGL=<stat>	**Success:** **If text mode (+CMGF=1),for SMS-SUBMITs or SMS-DELIVERs:** +CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]] **If text mode (+CMGF=1), for SMS-STATUS-REPORTs** (current not supported): +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[< CR><LF> +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]] **If text mode (+CMGF=1), for SMS-COMMANDs** (current not supported): +CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>+CMGL: <index>,<stat>,<fo>,<ct>[...]] **If text mode (+CMGF=1), for CBM storage** (current not supported): +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR> <LF> +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]] **If PDU mode (+CMGF=0):** +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]] **Fail:** ERROR
AT+CMGL=?	**Success:**

	+CMGL: (list of supported <stat>s) **Fail:** ERROR

Defined value

Parameter	Explain
<index>	The value is the range of location number supported by the associated memory
<stat>	In PDU mode (default 0), or in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values: **0** or "REC UNREAD" received unread message (i.e. new message) **1** or "REC READ" received read message
	2 or "STO UNSENT" stored unsent message (only applicable to SMS) **3** or "STO SENT" stored sent message (only applicable to SMs) **4** or "ALL " all message (only applicable to +CMGL)
<alpha>	The alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007 [9]).
<da>	Destination address, 3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <toda>.
<oa>	Originating address, 3GPP TS 23.040 [3] TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <tooa>.
<df>	3GPP TS 23.040 [3] TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds, and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08".
<scts>	3GPP TS 23.040 [3] TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<fo>	Frist Octet, depending on the command or result code: first octet of 3GPP TS 23.040 [3] SMS-DELIVER, SMSSUBMIT (default 33), SMS-STATUS-REPORT, or SMS- COMMAND in integer format.

<pid>	Protocol identifier. 3GPP TS 23.040 [3] TP-Protocol-Identifier in integer format (default 0)
<dcs>	Data Coding Scheme. Depending on the command or result code: 3GPP TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<vp>	Depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040 [3] TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>).
<ct>	GPP TS 23.040 [3] TP-Command-Type in integer format (default 0).
<mr>	3GPP TS 23.040 [3] TP-Message-Reference in integer format.
<ra>	3GPP TS 23.040 [3] TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set(refer command +CSCS in 3GPP TS 27.007 [9]); type of address given by <tora>.
<toda>	3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129).
<tora>	3GPP TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>).
<tooa>	3GPP TS 24.011 [6] TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>).
<length>	The value indicating in the text mode (+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<data>	In the case of SMS: 3GPP TS 23.040 [3] TP-User-Data in text mode responses;
<pdu>	In the case of SMS: 3GPP TS 24.011 [6] SC address followed by 3GPP TS 23.040 [3] TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).
<sn>	3GPP TS 23.041 [4] CBM Serial Number in integer format.
<st>	3GPP TS 23.041 [4] CBM Message Identifier in integer format.
<mid>	3GPP TS 23.041 [4] CBM Message Identifier in integer format.
<page>	3GPP TS 23.041 [4] CBM Page Parameter bits 4-7 in integer format.
<pages>	3GPP TS 23.041 [4] CBM Page Parameter bits 0-3 in integer format.

12.5 AT+CMGD

Description

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

+CMS ERROR: <err> is returned.

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

Syntax

Command	Response
AT+CMGD=<index>[,<delflag>]	**Success:** OK **Fail:** ERROR
AT+CMGD=?	**Success:** +CMGD: (list of support <index>s),(list of supported <delflag>s) **Fail:** ERROR

Defined value

Parameter	Explain
<index>	The value is the range of location number supported by the associated memory
<deflag>	Indicating multiple message deletion request as follows **0** Delete the message specified in <index>. **1** Delete all read messages from preferred message storage(mem1), leaving unread messages and stored mobile originated messages (whether sent or not) untouched. **2** Delete all read messages from preferred message storage(mem1) and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched. **3** Delete all read messages from preferred message storage(mem1), sent and unsent mobile originated messages leaving unread messages untouched. **4** Delete all messages from preferred message storage(mem1) including unread messages.

12.6 AT+CMGW

Description

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default, message status is set to 'stored unsent', but parameter <stat> allows also other status values to be given. The entering of text is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for <err> values.

Syntax

Command	Response
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>	**Success:** +CMGW: <index> **Fail:** ERROR
AT+CMGW=?	**Success:** OK OK **Fail:** ERROR

Defined value

Parameter	Explain
<index>	Index of message in selected preferred storage memory<mem2> by command +CSMP configuration.
<oa>	Originating address, 3GPP TS 23.040 [3] TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <tooa>.
<da>	Destination address, 3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet

	characters) are converted to characters of the currently selected TE character set; type of address given by <toda>.
<toda>	3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<tooa>	3GPP TS 24.011 [6] TP-Originating-Address Type-of-Address octet in integer format (default refer<toda>)
<stat>	In PDU mode (default 0), or in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values: **0** "REC UNREAD" received unread message (i.e. new message) **1** "REC READ" received read message **2** "STO UNSENT" stored unsent message (only applicable to SMS) **3** "STO SENT" stored sent message (only applicable to SMs)
<length>	The value indicating in the text mode (+CMGF=1) the length of the message body in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e., the RP layer SMSC address octets are not counted in the length)

NOTE

- **SMS-COMMANDs and SMS-STATUS-REPORTs cannot be stored in text mode.**

12.7 AT+CMSS

Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned.

Syntax

Command	Response
AT+CMSS=<index>[,<da>[,<toda>]]	if text mode (+CMGF=1) and sending **Success:** +CMSS: <mr>[,<scts>] if PDU mode (+CMGF=0) and sending **Success:** +CMSS: <mr>[,<ackpdu>] **Fail:** ERROR
AT+CMSS=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<index>	Index of message in selected preferred storage memory<mem2>
<da>	Destination address, 3GPP TS 23.040 [3] TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set; type of address given by <toda>.
<toda>	3GPP TS 24.011 [6] TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)
<mr>	Message reference, 3GPP TS 23.040 [3] TP-Message-Reference in integer format.

12.8 AT+CMMS

Description

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

Test command returns supported values as a compound value.

Syntax

Command	Response
AT+CMMS=<n>	**Success:** OK **Fail:** ERROR
AT+CMMS?	**Success:** +CMMS: <n> OK **Fail:** ERROR
AT+CMMS=?	**Success:** +CMMS: (list of support <n>s) OK **Fail:** ERROR

Defined value

Parameter	Explain
<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 <n>=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).

12.9 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	Response
AT+CSCA=<sca>[,<tosca>]	**Success:**

	OK **Fail:** ERROR
AT+CSCA?	**Success:** +CSCA: <sca>,<tosca> OK **Fail:** ERROR
AT+CSCA=?	OK

Defined value

Parameter	Explain
<sca>	3GPP TS 24.011 [6] RP SC address Address-Value field in string format; BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters
<tosca>	3GPP TS 24.011 [6] RP SC address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43), default value is 145, otherwise default value is 129).

12.10 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.

Syntax

Command	Response
AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	**Success:** OK **Fail:** ERROR
AT+CSMP?	**Success:** +CSMP: <fo>,<vp>,<pid>,<dcs>

	OK **Fail:** ERROR
AT+CSMP=?	OK

Defined value

Parameter	Explain
<fo>	First octet for sms submit pdu,status report required
<yp>	Validity period
<pid>	Protocol identifier
<dcs>	Data coding scheme

12.11 AT+CSMS

Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of <err> values. Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.

Syntax

Command	Response
AT+CSMS=<service>	**Success:** +CSMS:<mt>,<mo>,<bm> OK **Fail:** ERROR
AT+CSMS?	**Success:** +CSMS: <service>,<mt>,<mo>,<bm> OK **Fail:** ERROR
AT+CSMS=?	+CSMS: (0-1) OK

Defined value

Parameter	Explain
<service>	0 3GPP TS 23.040 and 3GPP TS 23.041. 1 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of <service> setting 1 is mentioned under corresponding command descriptions).
<mt>	Mobile Terminated Message 0 Type not supported 1 Type supported
<mo>	Mobile Originated Message 0 Type not supported 1 Type supported
<bm>	Broadcast type Message 0 Type not supported 1 Type supported

12.12 AT+CPMS

Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME, final result code

+CMS ERROR: <err> shall be returned.

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

Syntax

Command	Response
AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	**Success:** +CPMS:<used1>,<total1>,<used2>,<total2> ,<used3>,<total3> OK **Fail:** ERROR:
AT+CPMS?	**Success:** +CPMS:<mem1>,<used1>,<total1>,<mem2>, <used2>,<total2>,<mem3>,<used3>,<to tal3> OK **Fail:** ERROR

AT+CPMS=?	+CPMS: ("ME","MT","SM","SR"),("ME","MT","SM","SR"),("ME","MT","SM","S OK

Defined value

Parameter	Explain
<mem1>	The memory storage from which message are read and deleted. "SM" (U)SIM message storage "ME" Mobile Equipment (ME) message storage "MT" any of the storage associated with ME (same as "ME" storage) "BM" broadcast message storage (current not support) "SR" SMS status report storage
<mem2>	The memory storage to which writing and sending operation are made. Refer <mem1> for defined values. "SM" (U)SIM message storage "ME" Mobile Equipment (ME) message storage "MT" any of the storage associated with ME (same as "ME" storage) "BM" broadcast message storage (current not support) "SR" SMS status report storage
<mem3>	The memory storage to which received SMS message are preferred to be stored. Refer <mem1> for defined values. "SM" (U)SIM message storage "ME" Mobile Equipment (ME) message storage "MT" any of the storage associated with ME (same as "ME" storage) "BM" broadcast message storage (current not support) "SR" SMS status report storage
<used1>	Number of current messages in <mem1>
<used2>	Number of current messages in <mem2>
<used3>	Number of current messages in <mem3>
<total1>	Total number of messages that can be stored in <mem1>
<total2>	Total number of messages that can be stored in <mem2>
<total3>	Total number of messages that can be stored in <mem3>

12.13 AT+CSDH

Description

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

Syntax

Command	Response
AT+CSDH=<show>	**Success:** OK **Fail:** ERROR
AT+CSDH?	**Success:** +CSDH: <show> OK **Fail:** ERROR
AT+CSDH=?	**Success:** +CSDH: (list of support <show>s) **Fail:** ERROR

Defined value

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

12.14 AT+CNMI

Description

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

Test command gives the settings supported by the TA as compound values.

Syntax

Command	Response
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	**Success:** OK **Fail:** ERROR
AT+CNMI?	**Success:** +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK **Fail:** ERROR
AT+CNMI=?	**Success:** +CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) OK **Fail:** ERROR

Defined value

Parameter	Explain
<mode>	Controls the processing of unsolicited result codes specified within this command, the setting affects only to unsolicited result codes specified within this command. **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 in band technique used to embed result codes and data when TA is in on-line data mode.

<mt>	Controls the processing of unsolicited result codes specified within this command, the setting affects only to unsolicited result codes specified within this command. **0** No SMS-DELIVER indications are routed to the TE. **1** If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index> **2** SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>,[<alpha>],<scts>*[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]*<CR><LF><data> (text mode enabled; about parameters in italics, refer command Show Text Mode Parameters +CSDH) Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1. **3** Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
<bm>	The rules for storing received CBMs depend on its data coding scheme (refer 3GPP TS 23.038[2]), the setting of Select CBM Types (+CSCB) and this value is: **0** No CBM indications are routed to the TE. **1** If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: a. +CBMI: <mem>, <index> **2** New CBMs are routed directly to the TE using unsolicited result code: a. +CBM: <length><CR><LF><pdu> (PDU mode enabled); or b. +CBM:<sn>, <mid>, <dcs>, <page>, <pages><CR><LF><data> (text mode enabled)
<ds>	(Currently not support) **0** No SMS-STATUS-REPORTs are routed to the TE **1** SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: a. +CDS: <length><CR><LF><pdu> (PDU mode enabled); or +CDS:<fo>, <mr>, [<ra>], [<tora>], <scts>, <dt>, <st> (text mode enabled) **2** If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>, <index>

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

12.15 AT+CNMA

Description

For Text mode:

Execution command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1. TA shall not send another +CMT or
+CDS result code to TE before previous one is acknowledged. For PDU mode:
Set command can send either positive (RPACK) or negative (RP-ERROR) acknowledgement to the network. Parameter <n> defines which one is sent.

Syntax

Command	Response
If Text mode(+CMGF=1) AT+CNMA If PDU mode(+CMGF=0) AT+CNMA[=<n>[,<length>[<CR> PDU is given<ctrl-Z/ESC>]]]	**Success:** OK **Fail:** ERROR
AT+CNMA=?	+CNMA: (0-2) OK

Defined value

Parameter	Explain
<n>	0 Command operates similarly as defined for the text mode 1 Send RP-ACK to the network, accept only in PDU mode. 2 Send RP-ERROR (ME/TA shall send SMS-DELIVER REPORT with 3GPP TS 23.040[3] TP-FCS value set to 'FF' (unspecified error cause).

12.16 AT+CMT

Description

SMS-DELIVERs are routed directly to the TE using unsolicited result code.
Currently only support TEXT mode SMS-DELIVER message display.

Syntax

Command	Response
AT+CMT	**Success:** +CMT: <oa>, <scts><CR><LF><data> (text mode enabled) OK **Fail:** ERROR

Defined value

Parameter	Explain
<length>	Deliver Message's source address (text mode enabled)
<oa>	Deliver Message's source address (text mode enabled)
<scts>	TP-Service-Centre-Time-Stamp in time-string format 3GPP TS 23.040 [3] TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds, and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"
<data>	The content of deliver message in HEX string format

13 TCP/IP Commands

Automatic context setting is done by the module.

13.1 AT+CIPMUX

Description

This command is used to start Up Multi-IP Connection

Syntax

Command	Response
AT+CIPMUX=<connection_mode>	**Success:** OK **Fail:**
AT+CIPMUX?	+CIPMUX: <n>
AT+CIPMUX=?	+CIPMUX: <connection_mode (0~1)> OK

Defined value

Parameter	Explain
<Connection mode>	0 Single IP connection 1 Multi IP connection

NOTE

- Only in IP initial state, AT+CIPMUX=1 is effective
- Only when the multiple IP connection and GPRS application are both shut down, AT+CIPMUX=0 is effective

Example

AT+CIPMUX=0
OK
AT+CIPMUX?
+CIPMUX:0 OK
AT+CIPMUX=?
+CIPMUX:(0,1) OK

13.2 AT+CIPTKA

Description

This command is used to set TCP Keep-alive Parameters

Syntax

Command	Response
AT+CIPTKA=<tcp_keepalive_mode> [<idle_time> [<interval_time> [<max_count >]]]	**Success:** OK **Fail:** ERROR
AT+CIPTKA?	+CIPTKA: <mode>,<keepIdle>,<keepInterval>, <keepCount> OK
AT+CIPTKA=?	+CIPTKA: 0,72000,750,90 OK

Defined value

Parameter	Explain
<mode>	Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism

Idle time	Idle time (in second) before TCP send the initial keepalive probe. 30-7200 Default: 7200
Interval time	Interval time (in second) between keepalive probesretransmission.30-600 Default: 75
Max count	Maximum number of keepalive probes to be sent. 1-9 Default: 9

13.3 AT+TCPFMT

Description

This command is used to Change the format of data being received through the TCP / UDP

It affects only the received data and not the data being sent

Syntax

Command	Response
AT+TCPFMT=<mode>	**Success:** **TCPFMT=0** OK **TCPFMT=1** OK **TCPFMT=1** OK **Fail:** ERROR
AT+TCPFMT?	**Success:** +TCPFMT: <mode> OK **Fail:** ERROR
AT+TCPFMT=?	**Success:** +TCPFMT: <mode<0~2>> OK

	Fail: ERROR

Defined value

Parameter	Explain
<mode>	0 ASCII 1 HEX 2 RAW

NOTE

- **The transmitted data will not be changed.**

13.4 AT+CIPSTART

Description

This command is used to start Up TCP Or UDP Connection

Syntax

Command	Response
AT+CIPSTART=<mode>, <"ip_address"|"domain_name">,<port>,[ssl_flag], [ca_cert_id],[client_cert_id],[prv_key_id]	**CIPMUX=0** CONNECT OK **CIPMUX=1** CONNECT OK +CIPSTART: *Connection number* OK

Single mode	**AT+CIPSTART=?**	+CIPSTART: <mode ("TCP"|"UDP")>,<"ip_address"|"domain_name">,<port(1~65535)>,[ssl_flag (0~1)],[ca_cert_id],[client_cert_id],[prv_key_id] OK
Multi-mode	**AT+CIPSTART=?**	+CIPSTART: <mode ("TCP"|"UDP")>,<"ip_address"|"domain_name">,<port (1~65535)>,[ssl_flag (0~1)],[ca_cert_id],[client_cert_id],[prv_key_id] OK

Reference

Parameter	Explain
Max Response Time:	75 seconds When mode is multi-IP state 160 seconds When mode is single state, and the state is IP INITIAL

Defined value

Parameter	Explain
<mode>	A string parameter which indicates the connection type “TCP” Establish a TCP connection “UDP” Establish a UDP connection
<IP address>	A string parameter which indicates remote server IP address
<port>	Remote server port (1~65535)
<domain name>	A string parameter which indicates remote server domain name
[ssl_flag]	0: ssl inactive 1: ssl enabled
[ca_cert_id]	CA certificate ID
[client_cert_id]	Client certificate ID
[prv_key_id]	Private key ID

NOTE

- If MUX=0 and the IP State is initial only then the command will be successful else it will show error.
- For MUX=1, automatic association of IP to a connection number will be assigned. 8 multiple IP connections are possible (0-7).

Example

```
AT+CIPSTART="TCP","111.205.140.139",6800
OK
CONNECT OK
AT+CIPSTART=1,"TCP","111.205.140.139",6800
OK
1, CONNECT OK
AT+CIPSTART=?
+CIPSTART: (“TCP”, “UDP”), (“(0-255).(0-255).(0-255).(0-255)”), (0-65535)
OK
AT+CIPSTART=?
+CIPSTART: (0-7), (“TCP”, “UDP”), (“(0-255).(0-255).(0-255).(0-255)”), (0-65535)
OK
```

13.5 AT+CIPSTATUS

Description

This command is used to query Current Connection Status

Syntax

Command	Response
When CIPMUX=1 (Multi-mode) **AT+CIPSTATUS=<connection_number (0-7)>** **AT+CIPSTATUS**	**Success:** **CIPMUX=1** +C:Connection_number(0-7),-1,(TCP/UDP),Domain IP,Port,status OK -- C:0,-1,<type>,<IP address>,<Port>,<State> ....

	C:7.. OK
When CIPMUX=0 (Single-mode) AT+CIPSTATUS	**CIPMUX=0** STATUS:<state> OK **Fail**: ERROR
AT+CIPSTATUS=?	+CIPSTATUS OK

Defined value

Parameter	Explain
<bearer>	0-1 GPRS bearer, default is 0 <server state> OPENING LISTENING CLOSING <client state> INITIAL CONNECTING CONNECTED REMOTE CLOSING CLOSING CLOSED
<state>	A string parameter which indicates the progress of connecting In Single IP state (CIPMUX=0): 0 IP INITIAL

	1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 TCP CONNECTING/UDP CONNECTING/SERVER LISTENING 6 CONNECT OK 7 TCP CLOSING/UDP CLOSING 8 TCP CLOSED/UDP CLOSED 9 PDP DEACT In Multi-IP state (CIPMUX=1): 0 IP INITIAL 1 IP START 2 IP CONFIG 3 IP GPRSACT 4 IP STATUS 5 IP PROCESSING 9 PDP DEACT

Example

```
AT+CIPSTATUS (CIPMUX=0)

OK
STATE:IP INITIAL
AT+CIPSTATUS (CIPMUX=1)

OK
STATE:IP INITIAL
C:0,0,TCP,,0,IP INITIAL
C:1,0,TCP,,0,IP INITIAL
C:2,0,TCP,,0,IP INITIAL
C:3,0,TCP,,0,IP INITIAL
C:4,0,TCP,,0,IP INITIAL
```

```
C:5,0,TCP,,0,IP INITIAL
C:6,0,TCP,,0,IP INITIAL
C:7,0,TCP,,0,IP INITIAL
```

13.6 AT+CIPSPRT

Description

This command is used to Set Prompt Of '>' When Module Sends Data

Syntax

Command	Response
AT+CIPSPRT=<sending_prompt_mode (0~2)>	**Success:** OK **Fail:** ERROR
AT+CIPSPRT?	+CIPSPRT: <send prompt> OK
AT+CIPSPRT=?	+CIPSPRT: <list of send prompt mode> OK

Defined value

Parameter	Explain
<send prompt mode>	A numeric parameter which indicates whether to echo prompt '>' after module issues AT+CIPSEND command. 0: It shows "send ok" but does not prompt echo '>' when sending is successful. 1: It prompts echo '>' and shows "send ok" when sending is successful. 2: It neither prompts echo '>' nor shows "send ok" when sending is successful.

```
AT+CIPSPRT=?
```

+CIPSPRT0,1,2) OK
AT+CIPSPRT=2
OK
AT+CIPSPRT?
+CIPSPRT:2 OK

Example

13.7 AT+CIPQSEND

Description

This command is used to Select Data Transmitting Mode

Syntax

Command	Response
AT+CIPQSEND=<transmitting_mode (0~1)>	**Success:** **When transmitting mode=0** OK **When transmitting mode=1** OK **Fail:** ERROR
AT+CIPQSEND?	CIPQSEND: <n> OK
AT+CIPQSEND=?	+CIPQSEND: <transmitting_mode ((0~1))> OK

Defined value

Parameter	Explain
<transmitting_mode>	0 Normal mode – when the server receives TCP data, it responds SEND OK. (using CIPSEND)

	1 Quick send mode – when the data is sent to module, it will response DATA ACCEPT:<n>,<length>.

Example

```
AT+CIPQSEND=0

OK
AT+CIPQSEND?
+CIPQSEND: 0

OK
AT+CIPSEND

>
Hello
SEND OK

AT+CIPQSEND=1
OK
AT+CIPSEND
>
HelloDATA ACCEPT:5
OK
SEND OK
```

13.8AT+CIPATS

Description

This command is used to Set Auto Sending Timer

Syntax

Command	Response
AT+CIPATS=<sending_timer_mode (0~1)>[,<time (1~100)>]	**Success:** OK **Fail:** ERROR
AT+CIPATS?	+CIPATS: <mode>,<time> OK
AT+CIPATS=?	+CIPATS: 0,1 OK

Defined value

Parameter	Explain
<sending_timer_mode>	A numeric parameter which indicates whether set timer when module is sending data 0 Not set timer when module is sending data 1 Set timer when module is sending data
<time>	1..100 A numeric parameter which indicates the seconds after which the data will be sent

NOTE

When the mode is set to 0, the second parameter time should not be set; when the mode is set to 1, the time should be set.

Example

```
AT+CIPATS=?

+CIPATS:(0,1)

OK
AT+CIPATS=1,50
OK
AT+CIPATS?
+CIPATS:1,50

OK
```

13.9 AT+CIPSEND

Description

This command is used to Send Data through TCP Or UDP Connection

Syntax

Command	Response
AT+CIPSEND=<connection_number>	**Success:** **CIPMUX=0**

[,<length >] > Your message	SEND OK OK **CIPMUX=1** *connection number*, SEND OK OK **Fail:** ERROR
AT+CIPSEND?	**CIPMUX=0** +CIPSEND: <size> OK **CIPMUX=1** +CIPSEND: <n>,<size> OK
AT+CIPSEND	• response >, then type data to be sent, tap CTRL+Z or ESC to send • +CME ERROR <err> • SEND OK When +CIPQSEND=0 • DATA ACCEPT:<length> When +CIPQSEND=1 • SEND FAIL If sending fails
AT+CIPSEND=?	+CIPSEND: [<length (1-65536)>] OK

Reference

- The data length which can be sent depends on network status.
- Set the time to send data automatically with the Command of AT+CIPATS.
- Only send data at the status of established connection.
- When +CIPQSEND=0 and the remote server no response
- After exceeding the idle time CLOSE will be reported.

Defined value

Parameter	Explain
<length>	A numeric parameter which indicates the length of sending data, it must be less than <size> (1-65536)
<connection_number>	The connection number

NOTE

+CIPSEND EXE Command can only be used in single IP connection mode (+CIPMUX=0) and to send data on the TCP or UDP connection that has been established already. Ctrl-Z is used as a termination symbol. ESC is used to cancel sending data. There are at most <size> bytes which can be sent at a time.

Example

```
AT+CIPSTART="TCP","111.205.140.139",6800

OK

CONNECT OK
AT+CIPSEND (CIPMUX=0)

> test trontrol+z

SEND OK
AT+CIPSEND=10 (CIPMUX=0)

> abcdefghij

SEND OK
AT+CIPSEND=1 (CIPMUX=1)

> test1 trontrol+z

1,SEND OK
AT+CIPSEND=1,10 (CIPMUX=1)


> abcdefghij

1,SEND OK
```

13.10 AT+CLPORT

Description

This command is used to set Local Port

Syntax

Command	Response
CIPMUX=0 AT+CLPORT=<mode ("TCP"|"UDP")>,<port (1~65535)>	**Success:** If MUX=0

CIPMUX=1 AT+CLPORT=<connection_number (0-7)><mode ("TCP"|"UDP")>,<port (1~65535)>	OK **If MUX=1** OK **Fail:** ERROR
AT+CLPORT?	CIPMUX=0 +CLPORT: TCP <port number>,UDP <port number> OK CIPMUX=1 +CLPORT: *<connection number>*, TCP<port>, UDP <port> OK

Defined value

Parameter	Explain
<mode>	A string parameter which indicates the connection type "TCP" TCP local port "UDP" UDP local port
<port>	0-65535 A numeric parameter which indicates the local port. Default value is 0, a port can be dynamically allocated a port.
<connection_number>	Connection number ranges from 0 to 7

NOTE

- CLPORT can be set only when multi IP connection and GPRS application are both shut down

Example

```
AT+CLPORT="TCP",23400 (CIPMUX=0)

OK
AT+CLPORT=? (CIPMUX=0)
+CLPORT:("TCP","UDP"),(0-65535)

OK
```

AT+CLPORT=? (CIPMUX=1)
+CLPORT: (0-7),(“TCP”,”UDP”),(0-65535) OK
AT+CLPORT?
+CLPORT:0,TCP:0,UDP:0 +CLPORT:1,TCP:23400,UDP:0 +CLPORT:2,TCP:0,UDP:0 +CLPORT:3,TCP:0,UDP:0 +CLPORT:4,TCP:0,UDP:0 +CLPORT:5,TCP:0,UDP:0 +CLPORT:6,TCP:0,UDP:0 +CLPORT:7,TCP:0,UDP:0 OK

13.11 AT+CIPSHOWTP

Description

This command is used to display Transfer Protocol in IP Head

Syntax

Command	Response
AT+CIPSHOWTP: <Mode (0~1)>	**Success:** OK **Fail:** ERROR
AT+CIPSHOWTP?	+CIPSHOWTP: <mode> OK
AT+CIPSHOWTP=?	+CIPSHOWTP: <display_transfer_protocol (0~1)> OK

Reference

If **+CIPSHOWTP=1** The format is +IPD,<data size>,<TCP/UDP>:<data>

Defined value

Parameter	Explain
<mode>	A numeric parameter which indicates whether to display transfer protocol in IP header to received data or not 0: Disable show transfer protocol 1: Enable show transfer protocol

NOTE

- When incomming TCP message, AT port will inform +RECEIVE with format:
  +RECEIVE:<connection_numer>,<msg_size>
- When remote ip mode is enable (1) and ip_header_mode enable, notification will add
  +IPD:<msg_size>,<protocol>
- This command will be effective only in single connection mode (+CIPMUX=0)
- Only when +CIPHEAD is set to 1, the setting of this command will Work.

Example

```
AT+CIPSHOWTP?
```

```
+CIPSHOWTP:0

OK
```

```
AT+CIPSHOWTP=?
```

```
+CIPSHOWTP: (0,1)

OK
```

```
AT+CIPSHOWTP=0
```

```
OK
```

13.12 AT+CIPSRIP

Description

This command is used to show Remote IP Address And Port When Received Data

Syntax

Command	Response
AT+CIPSRIP: <mode (0~1)>	**Success:** OK **Fail:**

	ERROR
AT+CIPSRIP?	+CIPSRIP: <mode> OK
AT+CIPSRIP=?	+CIPSRIP: <mode (0~1)> OK

Reference

CIPSRIP=1 the format is:

- For single IP connection (+CIPMUX=0) +RECV FROM:<IP ADDRESS>:<PORT>
- For multi IP connection (+CIPMUX=1) +RECEIVE,<n>,<data length>,<IP ADDRESS>:<PORT>

Defined value

Parameter	Explain
<mode>	A numeric parameter which shows remote IP address and port. 0: Disable Remote IP show in Receiving TCP message 1: Enable Remote IP show in Receiving TCP message.

NOTE

- When incomming TCP message, AT port will inform +RECEIVE with format:

  +RECEIVE:<connection_numer>,<msg_size>
- When remote ip mode is enable (1) the receive notification will append ip and port of remote
- +RECEIVE:<connection_numer>,<msg_size>,<ip>,<port>

Example

```
AT+CIPSRIP=?

+CIPSRIP:(0,1)

OK
AT+CIPSRIP=1

OK

AT+CIPSRIP?

+CIPSRIP:1
```

```
OK
```

13.13 AT+CIPMODE

Description

This command is used to select TCP Application Mode

Syntax

Command	Response
AT+CIPMODE: <mode (0~1)>	**Success:** OK **Fail:** ERROR
AT+CIPMODE?	+CIPDPDP: <mode> OK
AT+CIPMODE=?	+CIPMODE: <tcpip_application_mode (0~1)> OK

Defined value

Parameter	Explain
<mode>	0: normal mode 1: transparent mode

Example

```
AT+CIPMODE?

+CIPMODE:0

OK
AT+CIPMODE=?

+CIPMODE: (0-NORMAL MODE, 1-TRANSPARENT MODE)

OK
AT+CIPMODE=0

OK
```

13.14 AT+CDNSGIP

Description

This command is used to query the IP Address of Given Domain Name

Syntax

Command	Response
AT+CDNSGIP=<"domain name">	**Success:** +CDNSGIP: 1,"google.com", <related IP addresses of the domain name> OK **Fail**: ERROR
AT+CDNSGIP=?	+CDNSGIP: <"domain_name"> OK

Defined value

Parameter	Explain
<domain name>	A string parameter which indicates the domain name
<IP1>	A string parameter which indicates the first IP address corresponding to the domain name
<IP2>	A string parameter which indicates the second IP address corresponding to the domain name
<dns error code>	A numeric parameter which indicates the error code 8 DNS COMMON ERROR 3 NETWORK ERROR

Example

```
AT+CDNSGIP=?
OK
AT+CDNSGIP="www.google.com"
```

```
OK
+CDNSGIP: 1,”www.google.com”,”111.10.100.92”,”111.10.100.91”
```

13.15 AT+CDNSCFG

Description

This command is used to Configure Domain Name Server

Syntax

Command	Response
AT+CDNSCFG=<"primary_dns"> [,<"secondary_dns">]	**Success:** OK **Fail:** ERROR
AT+CDNSCFG?	• PrimaryDns: <pri_dns> • SecondaryDns: <sec_dns> OK
AT+CDNSCFG=?	

Defined value

Parameter	Explain
<primary_dns>	A string parameter which indicates the IP address of the primary domain name server. Default value is 0.0.0.0.
<secondary_dns>	A string parameter which indicates the IP address of the secondary domain name server. Default value is 0.0.0.0.

Example

```
AT+CDNSCFG?
```

```
PrimaryDns: <168.48.6.0>
SecondaryDns: <0.0.0.0>
OK
```

```
AT+CDNSCFG=?
```

```
+CDNSCFG: “PrimaryDNS”,”SecondaryDNS”

OK
AT+CDNSCFG="168.48.6.0","8.8.8.8"
OK
```

13.16 AT+CIPSHUT

Description

This command is used to Disconnect Wireless Connection

Syntax

Command	Response
AT+CIPSHUT	**Success:** SHUT OK OK **Fail:** ERROR
AT+CIPSHUT=?	+CIPSHUT OK

Reference

Max Response Time: 65 seconds

NOTE

- If this command is executed in multi-connection mode, all of the IP connection will be shut.
- User can close gprs pdp context by AT+CIPSHUT. After it is closed, the status is IP INITIAL.
- If +PDP: DEACT urc is reported which means the gprs is released by the network, then user still needs to execute AT+CIPSHUT command to make PDP context come back to original state.

Example

```
AT+CIPSHUT
```

```
SHUT OK
AT+CIPSHUT=?
OK
```

13.17 AT+CIPRXMODE

Description

This command is used to Used to Enable Reception Mode

Syntax

Command	Response
AT+CIPRXMODE=<mode>	**Success:** OK **Fail:** ERROR
AT+CIPRXMODE=?	+CIPRXMODE: <rx_mode (0~1)>,[<persist_flag>] OK

Defined value

Parameter	Explain
<mode>	0: Default stream to AT port 1: Save as file

Example

```
AT+CIPRXMODE=0
OK
AT+CIPRXMODE=1
OK
```

13.18 AT+CIPFLNAME

Description

This command is used to assign File Name to the created file.

Syntax

Command		Response
AT+CIPFLNAME="<filename>",<file_size>		**Success:** OK **Fail:** ERROR
Single mode	AT+CIPFLNAME=?	+CIPFLNAME: <filename>,[file_size(kB)] OK
Multi-mode	AT+CIPFLNAME=?	+CIPFLNAME: <filename>,<connection_numer(0~7)>,[file_size(kB)] OK

Defined value

Parameter	Explain
<filename>	File saved as user specified to /data directory permanently in SECURE MODE. This is to make sure then in an event of tampering into the modem filesystem, the hijacker will not be able to decrypt the TCP data.
<file_size>	Optional param, max data that will be stored to that file. Default is 25MB if blank and max value is 50MB. Upon reaching file_size limit, data will be discarded

Example

```
AT+CIPFLNAME=”File1”

OK
```

13.19 AT+CIPFLREAD

Description

This command is used to read from the File

Syntax

Command		Response
AT+CIPFLREAD		**Success:** OK **Fail:** ERROR
Single mode	AT+CIPFLREAD=?	+CIPFLREAD:<mode(0~2)>,<connection_number(0~7)>,[offset],[data_length] OK
Multi-mode	AT+CIPFLREAD=?	+CIPFLREAD: [mode(0~2)], [offset],[data_length] OK

Defined value

Parameter	Explain
<offset_size>	It is the start byte to be read from the file. offset_size can be optional, if blank, start from 1st byte.
<data_length>	Length of the data to be read from the offset_size. data_length can be optional, if blank, data will be displayed from offset_size till the end.

Example

```
AT+CIPSEND
>
GET /api/uploads/firmware/2.08.083 HTTP/1.1
Host: device.cavli.me
Port: 443
Accept: */*
SEND OK
+RECEIVE:0,94
AT+CIPFLINFO
```

```
+CIPFLINFO:/data/File1,94
OK
AT+CIPFLREAD
+CIPFLREAD:94,GET /api/uploads/firmware/2.08.083 HTTP/1.1
Host: device.cavli.me
Port: 443
Accept: */*
```

13.20 AT+CIPFLINFO

Description

This is used to displays the size and location of the file.

Syntax

Command		Response
AT+CIPFLINFO="<connection_number>"		**Success:** OK **FAIL:** ERROR
Single mode	AT+CIPFLINFO=?	+CIPFLINFO OK
Multi-mode	AT+CIPFLINFO=?	+CIPFLINFO: <connection_number(0~7)> OK

Defined Values

Parameter	Explain
<filename>	File name

Example

```
AT+CIPFLINFO=0
+CIPFLINFO: /data/File1,0
OK
```

13.21 AT+CIPFLDEL

Description

This command is used to delete the saved file

Syntax

Command	Response
AT+CIPFLDEL="<connection_number>"	**Success:** OK **FAIL:** ERROR
AT+CIPFLDEL=?	**+CIPFLDEL: <connection_number(0~7)>** **OK**

Example

```
AT+CIPFLDEL=0
OK
```

13.22 AT+CIPSLOAD

Description

This command is used to TCPS Upload or Delete Certificate

Syntax

Command	Response
AT+CIPSLOAD=<command>,<type>[cert_id]	**Success:** OK **Fail:** ERROR
AT+CIPSLOAD=?	+CIPSLOAD: <command: (1:write|2:read|3:delete)>,<type: (1:ca-cert|2:client-cert|3:priv-key)>,[cert_id] >data[max size :

	4096]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<command>	1: Write 2: Read 3: Delete
<type>	1: ca-cert 2: client-cert 3: priv-key

13.23 AT+CIPSERVER

Description

This command is used configure the module as a local TCP server.

Syntax

Command	Response
AT+CIPSERVER=<server_mode>, [port], [ipv6_priority], [ssl_flag], [ca-cert_id], [client_cert_id], [prv_key_id]	**Success:** SERVER OK OK **Fail:** ERROR
AT+CIPSERVER=?	**Success:** +CIPSERVER <server_mode (0~1)>,[port (1~65535)],[ipv6_priority (0~1)],[ssl_flag (0~1)],[ca_cert_id],[client_cert_id],[prv_key_id] **Fail:** ERROR

Defined value

Parameter	Explain
<mode>	0: disable 1: enable
<port>	1 - 65535 A numeric parameter which indicates the local port.
<ipv6_priority>	Set priority for IPV6 client connection. 0: Disable 1:Enable
<ssl_flag>	0: Disable ssl connection 1: Enable ssl connection
<client_cert_id>	Client certificate ID Default 1
< ca_cert_id>	CA certificate ID Default 1
<prv_key_id>	Private key ID Default 1

13.24 Example of TCP Client (Single IP connection)

Example

```
AT+CIPMUX=0
OK
AT+CIPSTART="TCP","111.205.140.139",6800
OK
+CIPSTART:0
CONNECT OK
AT+CIPSEND=5
> Just test `Control+z`
SEND OK
AT+CIPCLOSE
CLOSE OK
AT+CIPSHUT
```

SHUT OK

13.25 Example of TCP Client (Multi IP connection)

Example

AT+CIPMUX=1
OK
AT+CIPSTART="TCP","111.205.140.139",6800
OK +CIPSTART:1 CONNECT OK
AT+CIPSEND=1,5
> Just test `Control+z` SEND OK
AT+CIPCLOSE
CLOSE OK
AT+CIPSHUT
SHUT OK

14 HTTP Commands

14.1 AT+HTTPURL

Description

This command to set the URL of current HTTP(s) session

Syntax

Command	Response
AT+HTTPURL=<URL>	**Success:** OK **Fail:** ERROR
AT+HTTPURL=?	**Success:** +HTTPURL: <url> OK **Fail:** OK

Defined value

Parameter	Explain
URL	The url link

Example

```
AT+HTTPURL=https://en.wikipedia.org/wiki/C_(programming_language)
OK
```

NOTE

- The maximum permissible length is 2048 Bytes.

14.2 AT+HTTPADDHEAD

Description

This command is use to add the header field to HTTP(s) request

Syntax

Command	Response
AT+HTTPADDHEAD= <field>	**Success:** OK **Fail:** ERROR
AT+HTTPADDHEAD=?	**Success:** +HTTPADDHEAD: <value> OK **Fail:** ERROR

Defined value

Parameter	Explain
field	Field of HTTP(s) header

Example

```
AT+HTTPADDHEAD="Content-Type: application/json"

OK
```

14.3 AT+HTTPCONTENT

Description

This command adds the content to HTTP request

Syntax

Command	Response
AT+HTTPCONTENT=[length (0-153600)]<Ctrl+Z|Esc>	**Success:** OK

	Fail: ERROR
AT+HTTPCONTENT=?	**Success:** +HTTPCONTENT: [length (0-153600)]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
[length]	• 0: the content will get from AT promt (>) • > 0: the content length input

Example

```
AT+HTTPCONTENT=0

{"email":"anonymous@demo.com","password":"anonymous"}

OK
```

14.4 AT+HTTPREQUEST

Description

This command sends an HTTP(s) to URL with header and content by AT+HTTPHEAD and AT+HTTPCONTENT

Syntax

Command	Response
AT+HTTPREQUEST=<method: GET|POST|HEAD>	**Success:** +HTTPSEND: SUCCESS **Fail:** + HTTPSEND: FAIL
AT+HTTPREQUEST=?	**Success:** +HTTPREQUEST: <method(GET|POST|HEAD|DELETE|PUT)> OK**Fail:** ERROR

Defined value

Parameter	Explain
GET	Send HTTP(s) GET request
POST	Send HTTP(s) POST request
HEAD	Send HTTP(s) HEAD request

Example

```
AT+HTTPREQUEST=GET
OK
AT+HTTPREQUEST=POST
HTTPSEND:SUCCESS
```

14.5 AT+HTTPGETSTAT

Description

Get response status of a request

Syntax

Command	Response
AT+HTTPGETSTAT?	**Success:** STATUS_RESPONSE: $status_code **Failed:** +CME ERROR: <err>
AT+HTTPGETSTAT=?	**Success:** HTTPGETSTAT OK **Fail:** ERROR

Example

```
AT+HTTPGETSTAT?
```

```
STATUS_RESPONSE:403
OK
```

14.6 AT+HTTPGETHEAD

Description

Get header response of an HTTP(s) request

Syntax

Command	Response
AT+HTTPGETHEAD?	**Success:** Header **Fail:** ERROR
AT+HTTPGETHEAD=?	**Success:** +HTTPGETHEAD OK **Fail:** ERROR

Example

```
AT+HTTPGETHEAD?
```

```
X-Amz-Cf-Id: 8Rkt2Qu-NB-MKVK8
X-Amz-Cf-Pop: DUB2-C1
Via: 1.1 8dcd559356fc30961462
X-Cache: Error from cloudfron
Connection: close
Content-Length: 915
Content-Type: text/html
Date: Mon, 07 Mar 2022 06:32:
Server: CloudFront
HTTP/1.1 403 Forbidden
```

```
OK
```

14.7 AT+HTTPGETCLEN

Description

Get content length of response of an HTTP(s) request

Syntax

Command	Response
AT+HTTPGETCLEN?	**Success:** CONTENT_LENGTH:$LEN **Fail:** ERROR
AT+HTTPGETCLEN=?	**Success:** +HTTPGETCLEN OK **Fail:** ERROR

Example

```
AT+HTTPGETCLEN?
CONTENT_LENGTH:13641
OK
```

14.8 AT+HTTPGETCONT

Description

Get content of response from an HTTP(s) request base on position

Syntax

Command	Response
AT+HTTPGETCONT=[start],[end]	**Success:** Content data **Fail:**

	ERROR
AT+HTTPGETCONT=?	**Success:** +HTTPGETCONT: [start(0~2147483647),[end(0~2147483647)] OK **Fail:** ERROR

Defined value

Parameter	Explain
Start	Begin position of content
End	End of position want to get, **-1** or **none** is the length of response content

Example

AT+HTTPGETCONT=0,-1 → read all content of response
AT+HTTPGETCONT=10234,-1 → read content from position 10234 to end of content

14.9 AT+HTTPRMHEAD

Description

This command is used to remove all header files set by AT+HTTPHEAD

Syntax

Command	Response
AT+HTTPRMHEAD?	**Success:** OK **Fail:** ERROR
AT+HTTPRMHEAD=?	**Success:** +HTTPRMHEAD OK **Fail:** ERROR

Example

```
AT+HTTPRMHEAD?

OK
```

14.10 AT+HTTPCLEAN

Description

Remove all header fields, contents and URL set by above commands

Syntax

Command	Response
AT+HTTPCLEAN?	**Success:** OK **Fail:** ERROR
AT+HTTPCLEAN=?	**Success:** OK **Fail:** ERROR

Example

```
AT+HTTPCLEAN?

OK
```

14.11 AT+HTTPDOWNLOAD

Description

To download data from the URL entered

Syntax

Command	Response
AT+HTTPDOWNLOAD=<url>	**Success:**

	+HTTPDOWNLOAD: SUCCESS OK **Fail:** ERROR
AT+HTTPDOWNLOAD=?	+HTTPDOWNLOAD: <url> OK

Defined value

Parameter	Explain
<url>	The URL from where the data is being downloaded.

14.12 AT+HTTPFLINFO

Description

To get the information regarding the file created for download.

Syntax

Command	Response
AT+HTTPFLINFO	**Success:** OK **Fail:** ERROR
AT+HTTPFLINFO=?	**Success:** +HTTPFLINFO OK

14.13 AT+HTTPFLREAD

Description

To read the data that is present currently in the file that was created for download.

Syntax

Command	Response
AT+HTTPFLREAD=[mode],[offset], [data_length]	**Success:** +HTTPFLREAD=[data_length],[data_read] OK **Fail:** ERROR
AT+HTTPFLREAD=?	**Success:** +HTTPFLREAD: [mode(0~2)],[offset(0~52428800)],[data_length(0~52428800)] OK

Defined value

Parameter	Explain
[mode]	Specifies the mode that the command to be worked on. 0 - Read as Text 1 - Read as Hex 2 - Read as Raw Data
[offset]	The amount of data to be read.
[data_length]	The length of data that is downloaded.

14.14 AT+HTTPFLDEL

Description

To delete the file that was created for download.

Syntax

Command	Response
AT+HTTPFLDEL=<filename>	**Success:** OK **Fail:** ERROR
AT+HTTPFLDEL=?	**Success:** +HTTPFLDEL

	OK

14.15 Test Case

GET data from a URL:

- ✓ Set URL
- ✓ Set header
- ✓ Send request
- ✓ Read header
- ✓ Read content

AT+HTTPURL=https://regbin.com/echo
OK
AT+HTTPADDHEAD=”Content-Type: application/json”
OK
AT+HTTPADDHEAD=”Authorization: Bearer 0j9t8CKG13amkUtdjiCdMmRdb-tWEK4”
OK
AT+HTTPADDHEAD=”Accept: */*”
OK
AT+HTTPREQUEST=GET
HTTPSEND: SUCCESS
OK
AT+HTTPGETHEAD?
[*Header content*]
HTTP/1.1 200 OK
OK
AT+HTTPGETCONT?
[*Content*]

```
OK
```

POST data to URL:

- ✓ Set URL
- ✓ Add header
- ✓ Send request
- ✓ Read status response
- ✓ Read content

```
AT+HTTPURL=https://regbin.com/echo/post/json

OK

AT+HTTPADDHEAD=”Content-Type: application/json”

OK

AT+HTTPADDHEAD=”Authorization: Basic  am9zZXA6dnU=”

OK

AT+HTTPADDHEAD=”Accept:  application: application/json”

OK

AT+HTTPCONTENT=0

>

{ “Id”: 78912,
  “Customer”: “Josep Vu”,
  “Quantity”: 1,
  “Price”:  18.00
}

OK

AT+HTTPREQUEST=POST

HTTPSEND: SUCCESS

OK
```

AT+HTTPGETSTAT?
STATUS_RESPONSE:200
OK
AT+HTTPGETCONT?
{“success”: :true”}
OK

15 MQTT Commands

15.1 AT+MQTTCREATE

Description

This command is used to create a MQTT connection.

Syntax

Command	Response
AT+MQTTCREATE=<hostname>,<port>,<clientid>,<keepalive>,<cleansession>,[username],[password],[lastwillTopic],[lastwillMessage],[lastwillQos],[lastwillRetain],[version(3~4)]	**Success**: +MQTTCREATE: 3 : CREATED OK **fail**: ERROR **connected timeout:** +MQTTCONN: X: DISCONNECTED
AT+MQTTCREATE=?	**Success**: +MQTTCREATE: <hostname>,<port>,<clientid>,<keepalive>,<cleansession>,[username],[password],[lastwillTopic],[lastwillMessage],[lastwillQos],[lastwillRetain],[version(3~4)] OK

Defined value

Parameter	Explain
<hostname>	host name of MQTT server.
<port>	port of MQTT server.
<clientid>	Actual client ID
<keepalive>	For how long an MQTT connection should be active when idle; time in seconds.
<cleansession>	To avoid messages from prior session or not

	0: Disable 1: Enable
[username]	user name
[password]	Password
[lastwillTopic]	During unexpected disruption, message will be sent to this topic
[lastwillMessage]	During unexpected disruption, it is the message sent to the lastwillTopic
[lastwillQos]	Quality of Service of lastwill service
[lastwillRetain]	To decide if the message has to be retained in the server
[Version]	3, 4

NOTE

- To get the lastwillMessage you have to be subscribed to the lastwillTopic

Example

```
AT+MQTTCREATE="broker.mqttdashboard.com",1883,"C",180,0
```

```
+MQTTCREATE: 3: CREATED

OK
```

15.2 AT+MQTTCONN

Description

This command is used to establish a MQTT connection

Syntax

Command	Response
AT+MQTTCONN=<clientid>,[reconnection_flag],[reconnection_time]	**Success:** +MQTTCONN: <client_id>: CONNECTING +MQTTCONN:<client_id>: CONNECTED -- +MQTTCONN: client_id>: RECONNECTING, *reconnection attempt* +MQTTCONN: client_id>: CONNECTED --

	+MQTTPUBLISH: client_id>,0, [lastwillTopic], 11, [lastwillMessage] +MQTTCONN: <client_id>: RECONNECTING +MQTTCONN: <client_id>: CONNECTED **Fail:** +MQTTCONN: <client_id>: CONNECTING +MQTTCONN: <client_id>: CONNECTION FAIL ERROR **connected timeout:** +MQTTDISCONNECTED:<num>
AT+MQTTCONN=?	+MQTTCONN: <client_id>,[reconnection_flag],[reconnection_time(10~3600)],[reconnection_count(3~3600)] OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
[reconnection_flag]	0: Don't reconnect 1: Reconnect
[reconnection_time]	Reconnection time (10 to 3600 seconds)

Example

```
AT+MQTTCONN=3

+MQTTCONN: 3: CONNECTED,0

OK
```

15.3 AT+MQTTSTATUS

Description

This command is used to query MQTT connection status

Syntax

Command	Response
AT+MQTTSTATUS=<client_id>	**Success:** +MQTTSTATUS: 1 OK +MQTTSTATUS: 0 OK **Fail:** ERROR
AT+MQTTSTATUS=?	+MQTTSTATUS: <client_id> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
+MQTTSTATUS: 1	Active connection
+MQTTSTATUS: 0	Inactive connection

Example

```
AT+MQTTSTATUS=3
```

```
+MQTTSTATUS: 1

OK
```

15.4 AT+MQTTSUBUNSUB

Description

This command is used to subscribe and unsubscribe a topic.

Syntax

Command	Response
AT+MQTTSUBUNSUB=<client_id>, <topic>, <sub_flag>, <qos>	**success:** +MQTTSUBUNSUB: <client_id>: SUBSCRIBING +MQTTSUBUNSUB: <client_id>: SUBSCRIBE SUCCESS OK **fail:** +MQTTSUBUNSUB: <client_id>: SUBSCRIBE FAIL ERROR
AT+MQTTSUBUNSUB=?	+MQTTSUBUNSUB: <client_id>,<topic>,<sub_flag>,<qos> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<topic>	Topic of mqtt
<sub flag>	1: subscribe 0: unsubscribe
<qos>	Quality of service values includes 0, 1, 2

NOTE

To UNSUBSCRIBE only give the SUBUNSUB flag and don't give <qos> as it would results in errors.

Example

```
AT+MQTTSUBUNSUB=3,"C10QMV2.0.1",1,2
```

```
+MQTTSUBUNSUB: 3: SUBSCRIBING

+MQTTSUBUNSUB: 3: SUBSCRIBE SUCCESS

OK
```

15.5 AT+MQTTSUBUNSUBLT

Description

This command is used to subscribe and unsubscribe a large topic (>1KB).

Syntax

Command	Response
AT+MQTTSUBUNSUBLT=<client_id>,<sub_flag>,<qos> > Your large topic (max size: 65536) Ctrl+Z|Esc to publish the topic	**Success:** +MQTTSUBUNSUBLT:<client_id>: SUBSCRIBING +MQTTSUBUNSUB:<client_id>: SUBSCRIBE SUCESS OK **Fail:** +MQTTSUBUNSUBLT: <client_id>: SUBSCRIBE FAIL ERROR
AT+MQTTSUBUNSUBLT=?	+MQTTSUBUNSUBLT: <client_id>,<sub_flag>,<qos>>topic[max size : 65535]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client id
<sub flag>	0 Unsubscribe 1 Subscribe
<qos>	Quality of service value includes 0,1,2

15.6 AT+MQTTPUB

Description

This command is used to publish a message on a topic.

Syntax

Command	Response
AT+MQTTPUB=<client_id>,<topic>,<message>,<qos>,<duplicate>,<retain>, [message_id]	**Success:** +MQTTPUB: <client_id>: PUBLISHING +MQTTPUB: <client_id>: PUBLISH SUCCESS OK **Fail:** +MQTTPUB: <client_id>: PUBLISHING +MQTTPUB: <client_id>: PUBLISH FAIL
AT+MQTTPUB=?	+MQTTPUB:<client_id>,<topic>,<message>,<qos>,<duplicate>,<retain>,[message_id] OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<topic>	Topic of MQTT, see note for max length
<message>	Message to publish, see note for max length
<qos>	Quality of service values includes 0, 1, 2
<duplicate>	Duplicate flag of MQTT 0: Don’t duplicate 1: Duplicate
<retain>	Retain flag of MQTT 0: Don’t retain 1: Retain
[message_id]	Message ID

Example

```
AT+MQTTPUB=3,"C10QMV2.0.1","SUCCESSFUL OR NOT",2,0,0
```

```
+MQTTPUB: 3: PUBLISHING
```

```
+MQTTPUBLISH: 3,11,C10QMV2.0.1,17,SUCCESSFUL OR NOT

+MQTTPUB: 3: PUBLISH SUCCESS

OK
```

15.7 AT+MQTOPLEN

Description

Syntax

Command	Response
AT+MQTOPLEN=[<wo_option>]	**Success:** +MQTOPLEN: With OK **Fail:** ERROR
AT+MQTOPLEN?	**Success:** +MQTOPLEN: [<wo_option>] OK
AT+ MQTOPLEN=?	+MQTOPLEN: <wo_option: (0:Without|1:With)> OK

Defined value

Parameter	Explain
<wo_option >	0: Without 1:With

15.8 AT+MQTTPUBLM

Description

This command is used to publish a large message on a topic.

Syntax

Command	Response
AT+MQTTPUBLM=<client_id>, <topic>,<qos>,<duplicate>,<retain>, [message_size],[message_id] > Your large message (max size : 65536) **Ctrl+Z|Esc** to publish the message	**Success:** +MQTTPUBLM: <client_id>: PUBLISHING +MQTTPUBLM: <client_id>: PUBLISH SUCCESS,9 OK **Fail:** +MQTTPUBLM: <client_id>: PUBLISHING +MQTTPUBLM: <client_id>: PUBLISH FAIL
AT+MQTTPUBLM=?	+MQTTPUBLM: <client_id>,<topic>,<qos>,<duplicate>,<retain>,[message_size],[message_id] >message[max size : 65536]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<topic>	topic of MQTT, see note for max length
<qos>	quality of service values include 0, 1, 2
<duplicate>	Duplicate flag of MQTT 0: Don’t duplicate 1: Duplicate
<retain>	Retain flag of MQTT 0: Don’t retain 1: Retain
[message_size]	Total message size
[message_id]	Message ID

15.9 AT+MQTTPUBLT

Description

This command is used to publish large topic.

Syntax

Command	Response
AT+MQTTPUBLT=<client_id>,<message>, <qos>,<duplicate>,<retain> , [message_id] > *Your large topic (max size : 65536)* **Ctrl+Z|Esc** to publish the topic	**Success:** +MQTTPUBLT: <client_id>: PUBLISHING +MQTTPUBLT: <client_id>: PUBLISH SUCCESS,22 OK **Fail:** +MQTTPUBLT: <client_id>: PUBLISHING +MQTTPUBLT: <client_id>: PUBLISH FAIL
AT+MQTTPUBLT=?	+MQTTPUBLT: <client_id>,<message>,<qos>,<duplicate>,<retain>,[message_id] >topic[max size : 65535]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<message>	message to publish
<qos>	quality of service values include 0, 1, 2
<duplicate>	Duplicate flag of MQTT 0: Don’t duplicate 1: Duplicate
<retain>	Retain flag of MQTT 0: Don’t retain 1: Retain
[message_id]	Message ID

15.10 AT+MQTTPUBLTLM

Description

This command is used to publish large message on a large topic.

Syntax

Command	Response
AT+MQTTPUBLTLM=<client_id>,<qos>,<duplicate>,<retain>, [message_size],[message_id] > *Your large topic (max size : 65536)* **Ctrl+Z|Esc** to publish the topic > *Your large message (max size : 65536)* **Ctrl+Z|Esc** to publish the message	**Success:** +MQTTPUBLTLM: <client_id>: PUBLISHING +MQTTPUBLTLM: <client_id>: PUBLISH SUCCESS,12 OK **Fail:** +MQTTPUBLTLM: <client_id>: PUBLISHING +MQTTPUBLTLM: <client_id>: PUBLISH FAIL
AT+MQTTPUBLTLM=?	+MQTTPUBLTLM: <client_id>,<qos>,<duplicate>,<retain>,[message_size],[message_id] >topic[max size : 65535]<Ctrl+Z|Esc> >message[max size : 65536]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<qos>	quality of service values includes 0, 1, 2
<duplicate>	Duplicate flag of MQTT 0: Don't duplicate 1: Duplicate
<retain>	Retain flag of MQTT 0: Don't retain 1: Retain
[message_size]	Message size
[message_id]	Message ID

15.11 AT+MQTTDISCONN

Description

This command is used to disconnect MQTT connection.

Syntax

Command	Response
AT+MQTTDISCONN=<client_id>	**Success:** +MQTTCONN: <client_id>: DISCONNECTED +MQTTDISCONN: <client_id>: DISCONNECTED **fail:** ERROR
AT+MQTTDISCONN=?	AT+MQTTDISCONN=? +MQTTDISCONN: <client_id> OK

Defined value

Parameter	Explain
<client_id>	client ID

Example

```
AT+MQTTDISCONN=3

+MQTTDISCONN: 3: DISCONNECTED

OK
```

15.12 AT+MQTTDELETE

Description

This command is used to delete a MQTT connection

Syntax

Command	Response
AT+MQTTDELETE=<client_id>	**Success:** +MQTTCONN: <client_id>: DISCONNECTED +MQTTDELETE: <client_id>: DELETED OK **Fail:** ERROR
AT+MQTTDELETE=?	+MQTTDELETE: <client_id> OK

Defined value

Parameter	Explain
<client_id>	Client ID

Example

```
AT+MQTTDELETE=3

+MQTTDELETE: 3: DELETED

OK
```

15.13 AT+MQTTSLOAD

Description

This command is used to load a MQTTS certificate

Syntax

Command	Response
AT+MQTTSLOAD=<command:>, type:>,[cert_id] >data[max size : 4096]<Ctrl+Z|Esc>	**Success:** **If write** +MQTTSLOAD: certificate,1,cert size SAVED OK **If read** +MQTTSLOAD: certificate content

	OK **If delete** OK **Fail:** ERROR
AT+MQTTSLOAD=?	+MQTTSLOAD: <command: (1:write|2:read|3:delete)>,<type: (1:ca-cert|2:client-cert|3:priv-key)>,[cert_id] >data[max size : 4096]<Ctrl+Z|Esc>

Defined value

Parameter	Explain
<command>	1 Write 2 Read 3. Delete
<type>	1. CA-certificate 2. Client certificate 3. Private key
<cert_id>	Certificate ID
<data>	Data to be sent

15.14 AT+MQTTSCONN

Description

This command is used to establish a MQTTS connection.

Syntax

Command	Response
AT+MQTTSCONN=<client_id>, [ca_cert_id], [client_cert_id],[prv_key_id], [reconnection_flag],[reconnection_time(10~3600)]	**Success:** +MQTTSCONN: 3: CONNECTING +MQTTSCONN: 3: CONNECTED,1 OK **Fail:** +MQTTSCONN: 3: CONNECTING +MQTTSCONN: 3: CONNECTION FAILED

AT+MQTTSCONN=?	+MQTTSCONN: <client_id>,[ca_cert_id],[client_cert_id],[prv_key_id],[reconnection_flag],[reconnection_time(10~3600)], [reconnection_count(3~3600) OK

Defined value

Parameter	Explain
<client_id>	client ID
reconnection_flag	Reconnection flag
reconnection_time	Reconnection time

16 Hubble Message as a Service

16.1 AT+HUBBLEMAAS

Description

Create Hubble Message as a Service connection.

Syntax

Command	Response
AT+HUBBLEMAAS=<execution status>,[net_type], [topic_size], [message_size]	**Success**: +HUBBLEMAAS: CONNECTION SUCCESS OK **Fail**: +CME ERROR: <err>
AT+HUBBLEMAAS=?	+HUBBLEMAAS: <execution status (1:start|0:stop)>,[net_type(1~2)],[topic_size (1024~65535)],[message_size(1024~65536)]

Defined value

Parameter	Explain
<execution status >	0 – Stop 1 – Start
<network type>	1 – Private 2 - Public
<topic_size>	Topic size (1024~65536)
<message_size>	Message size (1024~65536)

16.2 AT+HMSUB

Description

Subscribe a HUBBLEMAAS topic

Syntax

Command	Response
AT+HMSUB= <topic>,<qos>	**Success:** +HMSUB: SUBSCRIBE SUCCESS OK **Fail:** +CME ERROR: <err>
AT+HMSUB=?	+HMSUB: <topic>, <qos (0~2)> OK

Defined value

Parameter	Explain
<topic>	Topic of hubblemaas
<qos>	Quality of service values le 0, 1, 2

16.3 AT+HMSUBLT

Description

Subscribe a large HUBBLEMAAS topic

Syntax

Command	Response
AT+HMSUBLT= <qos> *>Your large topic (max size: 65536)* **Ctrl+Z|Esc** to publish the topic	**Success:** +HMSUB: SUBSCRIBING +HMSUB: SUBSCRIBE SUCCESS OK **Fail:** +CME ERROR: <err>
AT+HMSUBLT=?	+HMSUBLT: <qos> >topic[max size : 65535]<Ctrl+Z|Esc>

Defined value

Parameter	Explain
<topic>	Topic of hubblemaas. Max sixe: 65536 Bytes
<qos>	Quality of service values : 0, 1, 2

16.4 AT+HMUNSUB

Description

Subscribe a HUBBLEMAAS topic

Syntax

Command	Response
AT+HMSUB= <topic>	**Success:** +HMUNSUB: UNSUBSCRIBE SUCCESS OK **Fail:** +CME ERROR: <err>
AT+HMSUB=?	+HMSUB: <topic>, <qos (0~2)> OK

Defined value

Parameter	Explain
<topic>	Topic of hubblemaas

16.5 AT+HMPUB

Description

Publish a HUBBLEMAAS message on topic

Syntax

Command	Response
AT+HMPUB=<topic>, <message>, <qos>,<duplicate>,<retain>,[message_id]	**Success:** +HMPUB: PUBLISH SUCCESS OK **fail:** +CME ERROR: <err>
AT+HMPUB=?	+HMPUB: <topic>,<message>,<qos (0~2)>,<duplicate (0~1)>,<retain (0~1)>,[message_id (1~65535)] OK

Defined value

Parameter	Explain
<topic>	Topic of Hubblemaas, see note for max length
<message>	Message to publish, see note for max length
<qos>	Quality of service values le 0, 1, 2
<duplicate>	Duplicate flag of Hubblemaas, value inclue 0, 1
<retain>	Retain flag of Hubblemaas, value le 0, 1

NOTE

The max length of Hubblemaas publish package is set to 999. the total length of topic, message and other Hubblemaas package data must be no larger than it, other Hubblemaas package data may use 9 byte at max, so the max length of topic and message is the length of mqtt publish package subtract the length of other Hubblemaas package data

16.6 AT+HMUNSUBLT

Description

Unsubscribe a large HUBBLEMAAS topic

Syntax

Command	Response
AT+HMUNSUBLT >*Your large topic (max size: 65536)* **Ctrl+Z|Esc** to publish the topic	**Success:** +HMSUB: UNSUBSCRIBING +HMSUB: UNSUBSCRIBE SUCCESS OK **Fail:** +CME ERROR: <err>
AT+HMUNSUBLT=?	+HMUNSUBLT: >topic[max size : 65535]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<**topic**>	topic of HubbleMAAS. Max size: 65536 Bytes

16.7 AT+HMPUBLM

Description

This command is used to publish a large message on a topic.

Syntax

Command	Response
AT+HMPUBLM=<topic>,<qos>,<duplicate>,<retain>,[message_size],[message_id] > Your large message (max size: 65536) **Ctrl+Z|Esc** to publish the message	**success:** +HMPUBLM: PUBLISHING + HMPUBLM: PUBLISH SUCCESS OK **fail:** + HMPUBLM: PUBLISHING + HMPUBLM: PUBLISH FAIL
AT+HMPUBLM=?	+HMPUBLM: <topic>,<qos (0~2)>,<duplicate (0~1)>,<retain (0~1)>,[message_size],[message_id (1~65535)] >message[max size : 65536]<Ctrl+Z|Esc>

	OK

Defined value

Parameter	Explain
<topic>	topic of MQTT, see note for max length
<qos>	quality of service value includes 0, 1, 2
<duplicate>	Duplicate flag of HubbleMAAS 0: Don't duplicate 1: Duplicate
<retain>	Retain flag of HubbleMAAS 0: Don't retain 1: Retain
[message_size]	Total message size
[message_id]	Message ID

16.8 AT+HMPUBLT

Description

This command is used to publish large topic.

Syntax

Command	Response
AT+HMPUBLT= <message>, <qos>,<duplicate>,<retain> , [message_id] > ***Your large topic (max size: 65536)*** **Ctrl+Z|Esc** to publish the topic	**Success:** +HMPUBLT: PUBLISHING + HMPUBLT: PUBLISH SUCCESS OK **Fail:** + HMPUBLT: PUBLISHING + HMPUBLT: PUBLISH FAIL
AT+HMPUBLT=?	+HMPUBLT: <message>,<qos (0~2)>,<duplicate (0~1)>,<retain (0~1)>,[message_id (1~65535)] >topic[max size : 65535]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<message>	Message to publish
<qos>	Quality of service value includes 0, 1, 2
<duplicate>	Duplicate flag of HubbleMAAS 0: Don't duplicate 1: Duplicate
<retain>	Retain flag of HubbleMAAS 0: Don't retain 1: Retain
[message_id]	Message ID

16.9 AT+HMPUBLTLM

Description

This command is used to publish large message on a large topic.

Syntax

Command	Response
AT+HMPUBLTLM= <qos>, <duplicate>, <retain>, [message_size],[message_id] > Your large topic (max size: 65536) **Ctrl+Z|Esc** to publish the topic > Your large message (max size: 65536) **Ctrl+Z|Esc** to publish the message	**Success:** +HMPUBLTLM: PUBLISHING +HMPUBLTLM: PUBLISH SUCCESS,12 OK **Fail:** +HMPUBLTLM: PUBLISHING +HMPUBLTLM: PUBLISH FAIL

AT+HMPUBLTLM=?	+HMPUBLTLM: <qos (0~2)>,<duplicate (0~1)>,<retain (0~1)>,[message_size],[message_id (1~65535)] >topic[max size : 65535]<Ctrl+Z|Esc> >message[max size : 65536]<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<qos>	Quality of service values includes 0, 1, 2
<duplicate>	Duplicate flag of HubbleMAAS 0: Don't duplicate 1: Duplicate
<retain>	Retain flag of HubbleMAAS 0: Don't retain 1: Retain
[message_size]	Message size
[message_id]	Message ID

16.10 AT+HUBBMSTATUS

Description

This command is used to query HUBBLEMAAS connection status.

Syntax

Command	Response
AT+HUBBMSTATUS?	**Success:** +HUBBMSTATUS: 1 OK +HUBBMSTATUS: 0 OK **Fail:**

	ERROR
AT+HUBBMSTATUS=?	+HUBBMSTATUS OK

Defined value

Parameter	Explain
+HUBBMSTATUS: 1	Active connection
+HUBBMSTATUS: 0	Inactive connection

17 Hubble DM Commands

17.1 AT+HUBBLEDM

Description

This command is used to send device management parameters to Cavli Hubble

Syntax

Command	Response
AT+HUBBLEDM= <execution status>, <network type>	OK or ERROR
AT+HUBBLEDM=?	+HUBBLEDM: <execution status (1:start|0:stop)>,[network type (1:private|2:public)] OK
OTHER	OK

Defined value

Parameter	Explain
<execution status>	Status 0 Stop 1 Start
<network type>	Type 1 Public 2 Private

18 Hubble Registration Command

18.1 AT+HUBBLEREG

Description

This command is used to register device to Cavli Hubble

Syntax

Command	Response
AT+HUBBLEREG=<account_id>, <plan_id>[,<group_id>]	**Success:** REGISTER SUCCESS **Fail:** REGISTER FAIL
AT+HUBBLEREG?	**If device is registered** +HUBBLEREG: REGISTERED **If device is unregistered** +HUBBLEREG: UNREGISTERED
AT+HUBBLEREG=?	+HUBBLEREG: <account_id>, <plan_id>[,<group_id>]

Defined value

Parameter	Explain
<account_id>	Account ID
<plan_id>	Plan ID
<group_id>	Group ID

Example

```
at+hubblereg="5cf762bbdb2144001af155f1","5f9c0380c45e450012ac3f97"

OK
REGISTRATION SUCCESS
```

19 Hubble FOTA AT commands

19.1 AT+HUBFOTA

Description

This command is used to check for update

Syntax

Command	Response
AT+HUBFOTA=<n>	✓ **If success:** – <response_data> – OK ✓ **If failed:** – +CME ERROR: <err>
AT+HUBFOTA=?	+HUBFOTA: (1-Check for Update, 2-Download Update)

Defined value

Parameter	Explain
<n>	1-Check for Update 2-Download Update

Example

```
AT+HUBFOTA=1

+HUBFOTA: CURRENT FW VERSION 2.2.0
+HUBFOTA: NEW FW VERSION 2.2.1
+HUBFOTA: BUILD NUMBER 20210205
+HUBFOTA: TYPE DELTA | TYPE FULL
OK

AT+HUBFOTA=2
```

```
+HUBFOTA: CURRENT FW VERSION 2.2.1

+HUBFOTA: NEW FW VERSION 2.2.1

+HUBFOTA: BUILD NUMBER 20210205

+HUBFOTA: ABORTED - No Update Available

OK
```

AT+HUBFOTA=2

```
+HUBFOTA: CURRENT FW VERSION 2.2.0

+HUBFOTA: NEW FW VERSION 2.2.1

+HUBFOTA: BUILD NUMBER 20210205

+HUBFOTA: TYPE DELTA | TYPE FULL

+HUBFOTA: UPDATING

OK
```

20 GNSS Commands

20.1 AT+CGPS

Description

This command is used to start or stop GPS session.

After the module is powered on and the module port appears, send the command AT+CGPS=1 after the device bootup period.

Syntax

Command	Response
AT+CGPS=<on/off>	OK
AT+CGPS=?	+CGPS<0-1> OK

Defined value

Parameter	Values	Explain
<on/off>	0-1	0 --- OFF stop GPS session 1 --- ON start GPS session

20.2 AT+CGPSRST

Description

This command is used to reset the GPS function of the module.

Syntax

Command	Response
AT+CGPSRST	OK
AT+CGPSRST=?	+CGPSRST OK

20.3 AT+GPSPORT

Description

The command is used to choose the output port for NMEA sentence.

Syntax

Command	Response
AT+GPSPORT=<port>	**Success:** OK **Fail:** ERROR
AT+GPSPORT=?	**Success:** +GPSPORT<0,1> OK **Fail:** ERROR

Defined value

Parameter	Values	Explain
<port>	0-3	0 --- GNSS 1 --- HS-USB NMEA port 2 --- UART3 port 3 --- Undefined port

Example

```
AT+GPSPORT?

+GPSPORT: 1
OK
AT+GPSPORT=?

+GPSPORT: (0-3)
OK
AT+GPSPORT=1

OK
```

20.4 AT+CGPSGLAT

Description

This command is used to get Latitude information.

Syntax

Command	Response
AT+CGPSGLAT	**Success:** +CGPSGLAT: **llll.ll,a** OK **Fail:** ERROR
AT+CGPSGLAT=?	+CGPSGLAT OK

Defined value

Parameter	Explain
<llll.ll>	Latitude of positions
<a>	N – North S – South V – Virtual Value

Example

```
AT+CGPSGLAT
```

```
+CGPSGLAT: 1133.010811,N
OK
```

20.5 AT+CGPSGLON

Description

This Command is used to get Longitude information.

Syntax

Command	Response
AT+CGPSGLON	**Success:** +CGPSGLON: **yyyy.yy,a** OK **Fail:** ERROR
AT+CGPSGLON=?	+CGPSGLON OK

Defined value

Parameter	Explain
<yyyy.yy,a>	Longitude of positions
<a>	E – East W – West V – Virtual Value

Example

```
AT+CGPSGLON

+CGPSGLON: 10750.297717,E
OK
```

20.6 AT+CGPSGALT

Description

This command is used to get Altitude information.

Syntax

Command	Response
AT+CGPSGALT	**Success:** +CGPSGALT: **xx.x,a** OK **Fail:**

	ERROR
AT+CGPSGALT=?	+CGPSGALT OK

Defined value

Parameter	Explain
<xx.x>	Antenna altitude above mean-sea-level
<a>	E – Units of antenna altitude, meters V – Virtual Value

Example

```
AT+CGPSGALT
```

```
+CGPSGALT: 833.2,M
OK
```

20.7 AT+CGPSHOT

Description

This Command is used for Hot start.

Syntax

Command	Response
AT+CGPSHOT	**Success:** OK **Fail:** ERROR
AT+CGPSHOT=?	+CGPSHOT OK

Example

```
AT+CGPSHOT
```

```
OK
```

20.8 AT+CGPSWARM

Description

This Command is used for Warm start.

Syntax

Command	Response
AT+CGPSWARM	**Success:** OK **Fail:** ERROR
AT+CGPSWARM=?	+CGPSWARM OK

Example

```
AT+CGPSWARM
OK
```

20.9 AT+CGPSCOLD

Description

This Command is used for Cold start.

Syntax

Command	Response
AT+CGPSCOLD	**Success:** OK **Fail:** ERROR
AT+CGPSCOLD=?	+CGPSCOLD OK

Example

```
AT+CGPSCOLD
```

```
OK
```

20.10 AT+CGPSNSAT

Description

This command is used to get the number of used Satellites.

Syntax

Command	Response
AT+CGPSNSAT=<system_id>	**Success:** +CGPSNSAT: num_sv OK **Fail:** ERROR
AT+CGPSNSAT=?	**Success:** +CGPSNSAT: <system_id> OK

Defined value

Parameter	Explain
<system_id>	The GNSS constellation
<num_sv>	0 – GPS 2 – Galileo 3 – GLONASS 4 – BeiDou 4 – QZSS

Example

```
AT+CGPSNSAT=0
```

```
+CGPSGNSAT: 4
OK
```

20.11 AT+CGPSNSAT

Description

This command is used to get the number of used Satellites.

Syntax

Command	Response
AT+CGPSNSAT=<system_id>	**Success:** +CGPSNSAT: num_sv OK **Fail:** ERROR
AT+CGPSNSAT=?	**Success:** +CGPSNSAT: <system_id> OK

Defined value

Parameter	Explain
<system_id>	The GNSS constellation
<num_sv>	0 – GPS 1 – Galileo 2 – GLONASS 3 – BeiDou 4 – QZSS

Example

```
AT+CGPSNSAT=0
```

```
+CGPSGNSAT: 4
```

```
OK
```

20.12 AT+CGPSNMEUR

Description

This command is used to Start/stop stream NMEA to AT port.

Syntax

Command	Response
AT+CGPSNMEUR=<Enable>,[time_s]	**Success:** OK **Fail:** ERROR
AT+CGPSNMEUR=?	+CGPSNMEUR: <0,1>,[<1-10>,<binary_mask>] OK

Defined value

Parameter	Explain
<Enable>	0 stop stream 1 start stream
<time_s>	<1-10> time delay between two NMEA's data (second)

Example

```
AT+CGPSNMEUR=1,5

OK
```

20.13 AT+CGPSGLONONL

Description

This command is used to Get Latitude value

Syntax

Command	Response
AT+CGPSGLONONL	**Success:** + CGPSGLATONL: llll.llllll **Fail:** ERROR
AT+CGPSGLONONL=?	+CGPSGLONONL OK

Defined value

Parameter	Explain
1111.111111	latitude value (0 is virtual value)

Example

```
AT+CGPSGLATONL
+CGPSGLATONL: 1000.427538
```

20.14 AT+CGPSGLATDIR

Description

This command is used to Get Latitude direction

Syntax

Command	Response
AT+CGPSGLATDIR	**Success:** + CGPSGLATDIR: a **Fail:** ERROR
AT+CGPSGLATDIR=?	+CGPSGLATDIR OK

Defined value

Parameter	Explain
a	N North S South V virtual value

Example

```
AT+CGPSGLATDIR
+CGPSGLATDIR: N
```

20.15 AT+CGPSGLONONL

Description

This command is used to Get longitude value.

Syntax

Command	Response
AT+CGPSGLONONL	**Success:**

	+ CGPSGLONONL: lllll.llllll OK **Fail:** ERROR
AT+CGPSGLONONL=?	+CGPSGLONONL OK

Defined value

Parameter	Explain
lllll.llllll	longitude value (0 is virtual value)

Example

```
AT+ CGPSGLONONL
```

```
+CGPSGLONONL: 07622.386514
```

20.16 AT+CGPSGLONDIR

Description

This command is used to Get longitude direction.

Syntax

Command	Response
AT+CGPSGLONDIR	**Success:** +CGPSGLONDIR: a OK **Fail:** ERROR

AT+CGPSGLONDIR=?	+CGPSGLONDIR OK

Defined value

Parameter	Explain
a	E East W West V virtual value

Example

```
AT+CGPSGLONDIR
```

```
+CGPSGLONDIR: E
```

20.17 AT+CGPSGTIMEST

Description

This command is used to Get time stamp.

Syntax

Command	Response
AT+CGPSGTIMEST	**Success:** +CGPSGALT: tttttt.tt OK **Fail:** ERROR
AT+CGPSGTIMEST=?	+CGPSGTIMEST

	OK

Defined value

Parameter	Explain
tttttt.tt	time stamp value (0 is virtual value)

Example

```
AT+CGPSGTIMEST
```

```
+CGPSGTIMEST: 121300.00
```

20.18 AT+CGPSGMODE

Description

This command is used for Get mode.

Syntax

Command	Response
AT+CGPSGMODE	**Success:** +CGPSGMODE: a OK **Fail:** ERROR
AT+CGPSGMODE=?	+CGPSGMODE OK

Defined value

Parameter	Explain
a	1 Fix not available 2 2D

	3 3D

Example

```
AT+CGPSGMODE
```

```
+CGPSGMODE: 2
```

20.19 AT+CGPSGSNR

Description

This command is used to get min SNR.

Syntax

Command	Response
AT+CGPSGSNR	**Success:** +CGPSGSNR: a OK **Fail:** ERROR
AT+CGPSGSNR=?	+CGPSGSNR OK

Defined value

Parameter	Explain
a	99 Fix not available, range 1-99

Example

```
AT+CGPSGSNR
```

```
+CGPSGSNR: 25
```

20.20 AT+CGPSXTRADATA

Description

Get XTRA data and inject XTRA data to GNSS. Run this command after enabling GNSS with command AT+CGPS=1

Syntax

Command	Response
AT+CGPSXTRADATA	**Success:** OK **Fail:** ERROR
AT+CGPSXTRADATA?	Query status of injected XTRA data **Success:** + CGPSXTRADATA: <injecteddata> OK **Fail:** ERROR
AT+CGPSXTRADATA=?	+CGPSXTRADATA: 0 OK

Defined value

Parameter	Explain
injecteddata	0: XTRA data is not injected 1: XTRA data is injected

NOTE

- Need internet before running command CGPSXTRADATA
- XTRA server is supported only via **IPv4**
- Run this command after enabling GNSS with command AT+CGPS=1
- The UTC and XTRA data that injected are removed after run cold start command AT+CGPSCOLD
- The status of injected UTC and XTRA data is set to 0 after run cold start AT+CGPSCOLD and disable GNSS: AT+CGPS=0

Example

```
AT+CGPSXTRADATA

OK

AT+CGPSXTRADATA?

+CGPSXTRADATA: 1           // Extra data injected

OK
```

20.21 AT+CGPSXTRATIME

Description

Get UTC time and inject UTC to GNSS. Run that command after enable GNSS with command AT+CGPS=1

Syntax

Command	Response
AT+CGPSXTRATIME	**Success:** OK **Fail:** ERROR
AT+ CGPSXTRATIME?	Query status of injected UTC time. **Success:** + CGPSXTRATIME: <injectedtime> OK

	Fail: ERROR
AT+ CGPSXTRATIME=?	+CGPSXTRATIME: 0 OK

Defined value

Parameter	Explain
injecteddata	0: UTC time is not injected 1: UTC time is injected

Example

```
AT+CGPSXTRATIME

OK
AT+CGPSXTRATIME?
+CGPSXTRATIME: 1
OK
```

20.22 AT+CGPSCFG

Description

This command is used to query NMEA sentence types for various Global Navigation Satellite Systems (GNSS), including GPS, Galileo, GLONASS, BeiDou, and QZSS.

Syntax

Command	Response
AT+CGPSCFG=<nmeatype>,[<mode>]	**Success:** OK

	Fail: ERROR
AT+CGPSCFG?	GP: <mode> GA: <mode> GL: <mode> BD: <mode> PQ: <mode> OK
AT+CGPSCFG=?	+CGPSCFG:<nmeatype(0-4)>[,<mode>] 0 : gpsnmeatype[,(0-31)] 1 : galileonmeatype[, (0-31)] 2 : glonassnmeatype[, (0-31)] 3 : beidounmeatype[, (0-31)] 4 : qzssnmeatype[, (0-31)] OK

Defined value

Parameter	Explain
<nmeatype>	0 : gpsnmeatype 1 : galileonmeatype 2 : glonassnmeatype 3 : beidounmeatype 4 : qzssnmeatype
[<mode>]	Range : 0-31

21 FTP Commands*

** Under development*

21.1 AT+CFTPCONF

Description

This command is used for configuring FTP connection.

Syntax

Command	Response
AT+CFTPCONF=<hostname>,[port],[username],[password],[mode],[type],[timeout] [ssl],[ca_cert_id],[client_cert_id],[client_key_id]	**Success:** OK **Fail:** ERROR
AT+CFTPCONF=?	+CFTPCONF: <hostname>,[port],[username],[password],[mode (0:passive|1:active)],[type (0:Binary|1:ASCII)],[timeout],[ssl (0:insecure|1:only control|2:both control and data)],[ca_cert_id],[client_cert_id],[client_key_id]

Defined value

Parameter	Explain
<hostname>	Remote hostname
[port]	Remote port
[username]	Username
[password]	Password

[mode]	Data transfer mode 0. Passive 1. Active
[type]	Data transfer type 0. Binary 1. ASCII
[timeout]	Timeout for network operations
[ssl]	SSL type 0. Insecure 1. Only control 2. Both control and data
[ca_cert_id]	CA certificate ID
[client_cert_id]	Client certificate ID
[client_key_id]	Client key ID

Example

```
AT+CFTPCONF="192.168.225.56",21,ftpserver,ftpserver123,0,1,180,0

OK
```

21.2 AT+CFTPSIZE

Description

This command is used for getting the size of the remote file

Syntax

Command	Response
AT+CFTPSIZE=<filepath>	**Success:** OK +CFTPSIZE:<filename>, <filesize> **Fail:** ERROR
AT+CFTPSIZE=?	+CFTPSIZE: <filepath> OK

Defined value

Parameter	Explain
<filepath>	Remote file path
<filename>	Remote file name
<filesize>	Remote file size

Example

```
AT+CFTPSIZE =upload/"C10QMV2.0.1.txt"
```

```
+CFTPSIZE:"C10QMV2.0.1.txt,65535
OK
```

21.3 AT+CFTPGET

Description

This command is used to read or download remote file

Syntax

Command	Response
AT+CFTPGET=<filepath>,[offset],[size],[save],[local_filename]	**Success:** OK +CFTPGET:<filename>,<data_size>,[data] **Fail:** ERROR
AT+CFTPGET=?	+CFTPGET: <filepath>,[offset],[size],[save],[local_filename] OK

Defined value

Parameter	Explain
<filepath>	Remote filepath
[offset]	Remote file offset for file reading
[size]	Reading size
[save]	Flag for saving as file
[local_filename]	Filename for saving as different name
<filename>	If set it is local_filename otherwise remote filename
<datasize>	Data size of current event
[data]	Data of current event if local_filename not set

Example

```
AT+CFTPGET=upload/"C10QMV2.0.1.txt",,,1,"v2.0.1success"
```

```
+CFTPGET:v2.0.1success,4096

OK
```

21.4 AT+CFTPPUT

Description

This command is used for uploading data or local file to remote side

Syntax

Command	Response
AT+CFTPPUT=<filepath>,[append],[length], [local_filename]]data[Ctrl+Z|Esc]	**Success:** OK +CFTPPUT:<filename>, <data_size> **Fail:** ERROR
AT+CFTPPUT=?	

Defined value

Parameter	Explain
<filepath>	Remote filepath
[append]	Flag for appending
[length]	Data size to be sent
[local_filename]	Filename for sending local file
<filename>	Remote filename
<datasize>	Sent data size
[data]	Data to be sent

Example

```
AT+CFTPPUT=upload/"C10QMV2.0.1.txt"
```

```
> data
+CFTPPUT:"C10QMV2.0.1.txt,65535
OK
```

21.5 AT+CFTPSCERT

Description

This command is used to manipulate certificate files

Syntax

Command	Response
AT+CFTPSCERT=<command>, <type>,[cert_id][data_length]]data[Ctrl+Z|Esc]	**success:** OK +CFTPPUT:<filename>, <data_size> **fail:** ERROR
AT+CFTPSCERT=?	+CFTPSCERT: <command>,<type>,[cert_id],[data_length] >data<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<command>	1. Write 2. Read 3. Delete
<type>	1. CA Certificate 2. Client Certificate 3. Private key
[cert_id]	ID for file
[data_length]	Using to specify data length before sending data instead of sending

[data]	Data to be saved

NOTE

Certificate id used an optional parameter. Default id is 1. It is same for CFTPCONF command. User can use private certificate mechanism without giving certificate id, default id will be 1. In this case CFTPCONF will use private certificate files even user not set id parameter because default id is 1. If user save private certificate without id and want to disable using private certificate for CFTPCONF, need to set id parameters as 0.

21.6 AT+CFTPFLLIST

Description

This command is used for listing local files

Syntax

Command	Response
AT+CFTPFLLIST	**success:** OK +CFTPFLLIST:<filename> **fail:** ERROR
AT+CFTPFLLIST=?	+CFTPFLLIST OK

Defined value

Parameter	Explain
<filename>	Local filename

21.7 AT+CFTPFLINFO

Description

This command is used to get local file size

Syntax

Command	Response
AT+CFTPFLINFO=<filename>	**Success:** OK +CFTPFLINFO:<filename>,<filesize> **Fail:** ERROR
AT+CFTPFLINFO=?	+CFTPFLINFO: <filename> OK

Defined value

Parameter	Explain
<filename>	Local filename
<filesize>	Local filesize

21.8 AT+CFTPFLREAD

Description

This command is used for reading local file

Syntax

Command	Response
AT+CFTPFLREAD=<filename>,[offset],[length],[read_as_hex]	**Success:** +CFTPFLREAD:<filename> ,<offset>,<size>,<data> OK **Fail:** ERROR
AT+CFTPFLREAD=?	+CFTPFLREAD: <filename>,[offset],[length], [read_as_hex] OK

Defined value

Parameter	Explain
<filename>	Local file name
[offset]	Local file offset for start reading
[length]	Read data size
[read_as_hex]	Flag for reading as hex
<size>	Data size of current event
<data>	Data of current event

Example

```
AT+CFTPFLREAD=v2.0.1success
```

```
+CFTPFLREAD:v2.0.1success,65535,data
```

21.9 AT+CFTPFLWRITE

Description

This command is used for writing local file

Syntax

Command	Response
AT+CFTPFLWRITE=<filename>, [offset],[length]]data[Ctrl+Z|Esc]	**success:** OK +CFTPFLWRITE:<filename>,<offset>,<length> **fail:** ERROR
AT+CFTPFLWRITE=?	+CFTPFLWRITE: <filename>,[offset],[length] >data<Ctrl+Z|Esc> OK

Defined value

Parameter	Explain
<filename>	Local file name
[offset]	Local file offset for start writing
[length]	Write data size
[data]	Data to be written

Example

```
AT+CFTPFLWRITE=testsuccess
> abcdefghijklmno
+CFTPFLWRITE:testsuccess,0,15
OK
```

21.10 AT+CFTPFLRENAME

Description

This command is used to rename local file

Syntax

Command	Response
AT+CFTPFLRENAME=<current_name>, <new_name>	**success:** OK **fail:** ERROR
AT+CFTPFLRENAME=?	+CFTPFLRENAME: <current_name>,<new_name> OK

Defined value

Parameter	Explain
<current_name>	Current local file name
<new_name>	New local file name

Example

```
AT+CFTPFLRENAME="v2.0.1success","testsuccess"
OK
```

21.11 AT+ CFTPFLDEL

Description

This command is used to delete the local file

Syntax

Command	Response
AT+CFTPFLDEL=<filename>	**Success:** OK **Fail:** ERROR
AT+CFTPFLDEL=?	+CFTPFLDEL: <filename>

	OK

Defined value

Parameter	Explain
<file_name>	Local file name

Example

```
AT+CFTPFLDEL=testsuccess
OK
```

22 USB Control Commands

22.1 AT+USBMODE

This command is used to set the USBMODE

Syntax

Command	Response
AT+USBMODE = <n>	**Success:** OK
AT+USBMODE =?	+USBMODE: <mode(none,peripheral,host,otg)> OK

Defined value

Parameter	Explain
<n>	none : To disable USB peripheral : To to connect various USB peripherals host : USB host is the system that connects to multiple USB clients. Otg : USB On-The-Go Mode

NOTE

- **USBMODE must be set to none before sleep**

23 DFOTA Commands

23.1 AT+DLDFOTA

Syntax

Command	Response
AT+ DLDFOTA =<url>	**Success:** DOWNLOAD_SUCCESS **Fail:** ERROR
AT+ DLDFOTA =?	+DLDFOTA: <url> OK

Defined value

Parameter	Explain
<url >	the git location of the firmware update file

23.2 AT+DFOTA

Syntax

Command	Response
AT+ DFOTA	**Success:** SUCCESS **Fail:** ERROR

AT+ DFOTA=?	+DFOTA OK

24 Filesystem Commands

24.1 AT+FSDWNFILE

Description

It stores (writes) a file into the file system. The stream of bytes can be entered after the > prompt has been provided to the user. The file transfer is terminated exactly when <size> bytes have been sent entered and either "OK" final result code or an error result code is returned. The feed process cannot be interrupted i.e. the command mode is re-entered once the user has provided the declared the number of bytes.

In implementation, <size> is limited to AT_CMD_LINE_BUFF_LEN (5KB by default). When <size> is larger than AT_CMD_LINE_BUFF_LEN, it will return error.

Syntax

Command	Response
AT+FSDWNFILE= <filename>,<size (1~20480)> >data	**Success:** OK **Fail**: ERROR
AT+FSDWNFILE=?	+FSDWNFILE: <file_name>, <size (1-65536)> OK

Defined value

Parameter	Explain
<**filename**>	File's name. It is an utf-8 string, and file name length must smaller than <specific fs>_FILE_NAME_MAX (mostly default 64 bytes)
<**size**>	File size expressed in bytes, must larger than zero, and smaller than min(AT_CMD_LINE_BUFF_LEN, file system size).

Example

```
AT+FSDWNFILE="test",10
```

```
> 1234567890
OK
```

24.2 AT+FSLSTFILE

Description

Retrieves some information about the file system. This command works on files stored in the device, for example downloaded files.

Syntax

Command	Response
List files stored on file system: **AT+FSLSTFILE=[<action>],<filename>**	**Success:** +FSLSTFILE: *filename list* OK -- +FSLSTFILE: *free space in the mentioned file* OK -- +FSLSTFILE: *size of mentioned file* OK **Fail:** ERROR
AT+FSLSTFILE=?	+FSLSTFILE: <op_code (0,1,2)> [,param] OK

Defined value

Parameter	Explain
<action>	> Option code 0 lists the files belonging to <tag> file type 1 gets the free space for the specific <tag> file type 2 gets the file size expressed in bytes,belonging to <tag> type(if specified)

<**filename(1~N)**>	File name (Not required when op code is zero)

Example

```
AT+FSLSTFILE=0
+FSLSTFILE:
AT_CFG_TCPIP.BIN,AT_CFG_0.BIN,AT_CFG_AUTOSAVE.BIN,sms_dm_nv.bin,cfw_nv.bin
OK
AT+FSLSTFILE=1
+FSLSTFILE:353408
OK
AT+FSLSTFILE=2,"cfw_nv.bin"
+FSLSTFILE: 2468
OK
```

24.3 AT+FSRDFILE

Description

Retrieves a file from the file system. When the file size is larger than AT_CMD_LINE_BUFF_LEN, only the file name and size will be output, and the file data will be ignored.

Syntax

Command	Response
AT+FSRDFILE=<filename>	**Success:** +FSRDFILE: filename, filesize, message **Fail:** ERROR
AT+FSRDFILE=?	+FSRDFILE: <file_name> OK

Defined value

Parameter	Explain
<**filename**>	File name

Example

```
AT+FSRDFILE="test"
```

```
+FSRDFILE: test,10,1234567890

OK
```

```
AT+FSRDFILE="test2"
```

```
+FSRDFILE: test2,100000,

OK
```

24.4 AT+FSRDBLOCK

Description

Retrieves a file from the file system. This command allows the user to read only a portion of the file. <size> should be larger than zero, and smaller than AT_CMD_LINE_BUFF_LEN.
When <offset> is larger than or equal to file size, it will return error.
The returned <size> is the real data size. It may less than the <size> in parameter.

Syntax

Command	Response
AT+FSRDBLOCK=<filename>,<offset>,<size>	**Success:** +FSRDBLOCK: filename, filesize, message **Fail**: +FSRDBLOCK: filename, Difference in memory
AT+FSRDBLOCK=?	+FSRDBLOCK: <filename>,<offset (0-2147483647)>,<size (1-65536)> OK

Defined value

Parameter	Explain
<**filename**>	File name
<**offset**>	Offset in bytes from the beginning of the file
<**size**>	Number of bytes to be read starting from the <offset>

Example

```
AT+FSRDBLOCK="test",5,5
```

```
+FSRDBLOCK: test,5,67890

OK
```

24.5 AT+FSDELFILE

Description

Deletes a stored file from the file system.

Syntax

Command	Response
AT+FSDELFILE=<filename>	**Success:** OK **Fail:** ERROR
AT+FSDELFILE=?	+FSDELFILE: <file_name> OK

Defined value

Parameter	Explain
<**filename**>	File name

Example

```
AT+FSDELFILE="test"

OK
```

25 Power Saving Mode Commands

25.1 AT+CSLEEP

Description

To set the device to sleep mode.

Syntax

Command	Response
AT+CSLEEP=1, [duration]	**Success:** OK **Fail:** ERROR
AT+CSLEEP=?	**Success:** +CSLEEP: 1, [duration] OK **Fail**: ERROR

Defined Value

Parameter	Explain
<duration>	Timer for sleep in sec

NOTE

- **The default value to enable sleep is 1.**
- **The device can be awakened by grounding the wakeup pin, by setting a timer, or by any other trigger(undefined).**

25.2 AT+CFSLEEP

Description

To set the device to fast sleep mode.

Syntax

Command	Response
AT+CFSLEEP=1, [duration]	**Success:** OK **Fail:** ERROR
AT+CFSLEEP=?	**Success:** +CFSLEEP: 1, [duration] OK **Fail:** ERROR

Defined Value

Parameter	Explain
<duration>	Timer for sleep in sec

26 RTC Commands

26.1 AT+C RTC

Description

This command is used to read the RTC time.

Syntax

Command	Response
AT+CRTC?	**Success:** +CRTC: (1-2) OK **Fail:** ERROR
AT+CRTC=<mode>	**Success:** +CRTC: %a %b %d %H:%M:%S %Z %Y OK or +CRTC: <epoch> **Fail:** ERROR
AT+CRTC=?	+CRTC: (1-2) OK

Defined Value

Parameter	Explain
<mode>	mode - 1 : Read time in format %a %b %d %H:%M:%S %Z %Y mode - 2 : Read time as epoch since 1st Jan 1970

Example

```
AT+CRTC=1
+CRTC: Mon Oct 30 14:22:43 UTC 2023
OK
AT+CRTC=2
+CRTC: 1698675767
OK
```

27 CME Error (GSM Equipment Related errors)

Error	Description
CME ERROR: 0	Phone failure
CME ERROR: 1	No connection to phone
CME ERROR: 2	Phone adapter link reserved
CME ERROR: 3	Operation not allowed
CME ERROR: 4	Operation not supported
CME ERROR: 5	PH_SIM PIN required
CME ERROR: 6	PH_FSIM PIN required
CME ERROR: 7	PH_FSIM PUK required
CME ERROR: 10	SIM not inserted
CME ERROR: 11	SIM PIN required
CME ERROR: 12	SIM PUK required
CME ERROR: 13	SIM failure
CME ERROR: 14	SIM busy
CME ERROR: 15	SIM wrong
CME ERROR: 16	Incorrect password
CME ERROR: 17	SIM PIN2 required
CME ERROR: 18	SIM PUK2 required
CME ERROR: 20	Memory full
CME ERROR: 21	Invalid index
CME ERROR: 22	Not found

CME ERROR: 23	Memory failure
CME ERROR: 24	Text string too long
CME ERROR: 25	Invalid characters in text string
CME ERROR: 26	Dial string too long
CME ERROR: 27	Invalid characters in dial string
CME ERROR: 30	No network service
CME ERROR: 31	Network timeout
CME ERROR: 32	Network not allowed, emergency calls only
CME ERROR: 40	Network personalization PIN required
CME ERROR: 41	Network personalization PUK required
CME ERROR: 42	Network subset personalization PIN required
CME ERROR: 43	Network subset personalization PUK required
CME ERROR: 44	Service provider personalization PIN required
CME ERROR: 45	Service provider personalization PUK required
CME ERROR: 46	Corporate personalization PIN required
CME ERROR: 47	Corporate personalization PUK required
CME ERROR: 48	PH-SIM PUK required
CME ERROR: 50	Occurs when the input command is wrong
CME ERROR: 100	Check the SIM card has valid active data connection
CME ERROR: 103	Illegal MS
CME ERROR: 106	Illegal ME
CME ERROR: 107	GPRS services not allowed
CME ERROR: 111	PLMN not allowed
CME ERROR: 112	Location area not allowed
CME ERROR: 113	Roaming not allowed in this location area
CME ERROR: 126	Operation temporary not allowed
CME ERROR: 132	Service operation not supported

CME ERROR: 133	Requested service option not subscribed
CME ERROR: 134	Service option temporary out of order
CME ERROR: 148	Unspecified GPRS error
CME ERROR: 149	PDP authentication failure
CME ERROR: 150	Invalid mobile class
CME ERROR: 256	Operation temporarily not allowed
CME ERROR: 257	Call barred
CME ERROR: 258	Phone is busy
CME ERROR: 259	User abort
CME ERROR: 260	Invalid dial string
CME ERROR: 261	SS not executed
CME ERROR: 262	SIM Blocked
CME ERROR: 263	Invalid block
CME ERROR: 527	Please wait, and retry your selection later (Specific Modem Sierra)
CME ERROR: 528	Location update failure – emergency calls only (Specific Modem Sierra)
CME ERROR: 529	Selection failure – emergency calls only (Specific Modem Sierra)
CME ERROR: 772	SIM powered down