Cavli C16QS LTE Cat 1.bis
AT Command Manual

External Release Version 2.9

Connect to our website and feel free to contact our technical support team for any assistance.

Cavli Inc.,

99 South Almaden Blvd., Suite 600, San Jose, California, 95113

Web: www.cavliwireless.com

IoT Connectivity Platform: www.cavlihubble.io

Support Center

https://www.cavliwireless.com/support-center.html

e-Mail: support@cavliwireless.com

For sales enquiries

https://www.cavliwireless.com/contact-us.html

e-Mail: sales@cavliwireless.com

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Version History

Version	Description	Date
1.0	• Initial Version (preliminary)	07–Dec–2022
1.1	• Qualcomm proprietary commands added • Document refined	08–Dec–2022
1.2	• Added HTTPDOWNLOAD and HTTPFL commands • Added MQTTSUBUNSUBLT command • Added Notes to MQTTCON & MQTTSCON	03-Jan-2023
1.3	• Added PPP commands • Added Hubble MasS and Hubble DM commands	19-Jan-2023
1.4	• Added AT+CGPSGPOS command • Updated Defined Values of <mode> in AT+HTTPFLREAD • Updated Defined Values of <mode> in AT+GPSPORT • Added Maximum file size for HTTPDOWNLOAD • Added Baud rate of GPSPORT	30-Jan-2023
1.5	• Updated command parameters of AT+PING • Update command parameter AT+CIPSERVER	17-Feb-2023
1.6	• Updated HUBBLEMAAS Commands	22-Mar-2023
1.7	• Updated AT+HUMPUBLM and AT+NETIF commands	30-Mar-2023
1.8	• Updated AT+CIPSEND command	26-April-2023
1.9	• Added TCP/IP File Commands • Added GPIO Commands	04-May-2023
2.0	• Added FTP commands • Added AT+TCPFMT command	05-Jun-2023
2.1	• Updated AT+CIPSERVER	01-Aug-2023
2.2	• Added Extended GNSS commands	07-Aug-2023
2.3	• Added AT+CGPSAGNSS & AT+CGPSVERIFY	16-Aug-2023
2.4	• Added DFOTA commands	10-Oct-2023

2.5	• Removed AT!LTEINFO Command	20-Oct-2023
2.6	• AT+CERTLOAD, AT+HTTPSLOAD and AT+MQTTLIMIT Commands added • Updated MQTT, HTTP, TCP and FTP message size • Updated the parameters of the command AT$QCPCFG • Updated the parameters of AT+CIPMODE • Updated the parameters of AT$QCUSBSYS	18-Dec-2023
2.7	• Corrected technical data in GNSS command (AT+CGPSGPOS).	04-Jan-2024

2.8	• Added commands for:
	    i. AT+CEREG
	    ii. AT+CMUX
	    iii. AT+CSCS
	• Removed the Chapter 11 Filesystem Commands
	• Added Chapter 11 CMUX Commands
	• Added a note under AT+PPPSTART on how to switch back to command state
	• Added information under DFOTA specifying the firmware from which it is functional
	• Introduced a note under FTP specifying the maximum local file size supported
		02-Feb-2024

2.9	• Updated the following command:
	    i. AT$QCDNSCFG
	    ii. AT$QCLEDMODE
	    iii. AT$QCFLASHMONITORINFO
	• Removed the command AT$QCPMUFG
		13-Feb-2024

1 Summary

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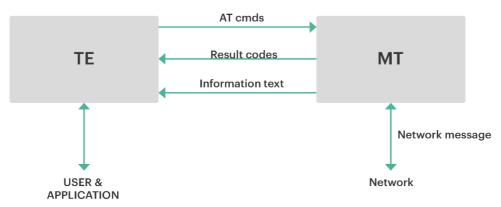
Figure 1 AT command interface

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 don't use double quotes, the spaces between the characters in the string are negligible.

✓ Please Note: In actual use, do not need to enter **< >**, *[]* as given in the read command.

✓ All AT commands are not case sensitive, "AT" or "at" is OK.

1.2 AT Command Interface

Each interface requires functional cohesion.

Because the AT command transmits the data packets through communication port, the size of the package is limited. For sending AT commands, in addition to the characters "AT", MT can receive 1600 characters in length at most, including the null character at the end of the commands. For MT actively reported response messages or URC, the maximum length is limited to 1600 characters.

Each command line can contain only one AT command.

For the URC or response which MT initiative report to TE, each line also allows only one AT command.

AT command ends with a carriage return, and response and reporting ends with the linefeed.

In order 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 a second AT command, it must first wait for the response of the first AT command from MT or the second AT command will not be executed.

In order to ensure the other processes, proceed without interference, it is suggested that the report response results in asynchronous mode for the AT command which need long 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 led to two kinds of reports confusion. For the special URC 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.

AT command string con not appear the combination of comma and quotes. The current version, does not support the escape character. For the UCS2 encoding format of the data, the encoding value reported in character format.

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 con not recognize the current interface, the result of command not support will be reported. If the parameters more than the original parameters, two report may be reported, the one is result 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

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

Syntax

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

Defined value

Parameter	Explain
<value>	0 DCE does not echo characters during command state and online command state 1 DCE echoes characters during command state and online command state (Default Value)

2.2 ATQ

Description

The setting of this parameter determines whether or not the DCE transmits unsolicited   result codes to the DTE. When result codes are being suppressed, unsolicited result is not transmitted.

Syntax

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

Defined Values

Parameter	Explain
<value>	0 DCE transmits unsolicited result codes. 1 Unsolicited result codes are suppressed and not transmitted • If set to"1", all unsolicited result codes are all suppressed, including: PING/IPERF/LWM2M unsolicited result codes; • If set to "1", only suppress the unsolicited result codes; And AT response/result codes are not suppressed (the default value is 0)

NOTE

- Currently, this command is not fully implemented as defined in ITU-T V.250

2.3 ATI

Description

Request manufacturer specific information about the TA.

Syntax

Command	Response
ATI	Manufacturer specific information OK/+CME ERROR: <err>

2.4 AT&F

Description

This command set parameters to default values specified by the manufacturer.

Syntax

Command	Response
AT&F[<value>]	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explanation
<value>	0 Set parameters to factory defaults

The following AT commands is set to factory-defined default value.

Parameter	Factory-defined defaults
ATE	1
ATQ	0
AT+CREG	0
AT+CEREG	0
AT+CEDRX	0
AT+CCIOTOPT	0
AT+CMGF	1
AT+CSCON	0
AT+CMEE	1
AT+CTZR	0
AT+CTZU	1
AT+CSMS	0
AT+CSD	0

2.5 AT&W

Description

This command store parameters to the user-defined configuration profile in non-volatile memory.

Syntax

Command	Response
AT&W[<value>]	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explanation
<value>	0 User-defined configuration profile ID

The following AT commands is set to user-defined configuration profile in non-volatile memory.

Parameter	Display with AT&V
ATE	Y
ATQ	Y
AT+CREG	N
AT+CEREG	N
AT+CEDRX	N
AT+CCIOTOPT	N
AT+CMGF	N
AT+CSCON	N
AT+CMEE	N
AT+CTZR	N
AT+CTZU	N
AT+CSMS	N
AT+CSD	N

2.6 AT&V

Description

This command displays the current settings of some basic command parameters.

Syntax

Command	Response
AT&V	**Success:** &C:<value> &D:<value> &F:<value> &W:<value> E: <value> Q: <value> OK **Fail:** ERROR

3 General Commands

3.1 AT+CMEE

Description

The write command disables or enables the use of final result code "+CME ERROR: <err>" as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause "+CME ERROR: <err>" final result code instead of the regular "ERROR" final result code. "ERROR" is

returned normally when error is related to syntax, invalid parameters or TA functionality. The read command returns the current setting of <n>.

Syntax

Command	Response
AT+CMEE=<n>	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explanation
<n>	0 Disable +CME ERROR: <err>result code and use ERRORinstead 1 Enable +CME ERROR: <err>result code and use numeric <err>values 2 Enable +CME ERROR: <err>result code and use verbose <err>values

3.2 AT+CGMI

Description

Execution command causes the TA to return one or more lines of information text <manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.

Syntax

Command	Response
AT+CGMI	**Success:** +CGMI: <manufacturer> OK **Fail:** ERROR
AT+CGMI=?	**Success:** +CGMI:<manufacturer_ID> OK **Fail:** ERROR

3.3 AT+CGMM

Description

Execution command causes the TA to return one or more lines of information text <model>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.

Syntax

Command	Response
AT+CGMM	**Success** +CGMM: <model> OK **Fail** ERROR
AT+CGMM=?	**Success** +CGMM: <list of supported technologies>, <model> OK **Fail** ERROR

3.4 AT+CGMR

Description

The execution command returns the manufacturer revision. Now it returns the firmware revision.

Removed build time from description

Syntax

Command	Response
AT+CGMR	**Success:** +CGMR: <manufacturer>, <modelname> OK **Fail:** ERROR

3.5 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
AT+CIMI	**Success:** +CIMI:<IMSI> OK **Fail:** ERROR
AT+CIMI=?	**Success:** OK **Fail:** ERROR

Defined Values

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

3.6 AT+CGSN

Description

The execution command returns the IMEI (International Mobile Station Equipment Identity) number and related information.

Syntax

Command	Response
AT+CGSN	**Success:** +CGSN: <sn/IMEI/IMEISV/SVN> OK **Fail:** ERROR

Defined value

Parameter	Explanation
<snt>	0: Return <sn> 1: Returns the IMEI (International Mobile station Equipment Identity) 2: Returns the IMEISV (International Mobile station Equipment Identity and Software Version number) 3 Returns the SVN (Software Version Number)
<sn>	One or more lines of information text determined by the MT manufacturer (not support now)
<imei>	; in decimal format indicating the IMEI
<imeisv>	; in decimal format indicating the IMEISV
<svn>	; in decimal format indicating the current SVN which is a part of IMEISV

3.7 AT+CCLK

Description

Set command sets the real-time clock of the MT. The read command returns the current setting of the clock.

Syntax

Command	Response
AT+CCLK=<time>	**Success:** OK **Fail:** ERROR
AT+CCLK?	**Success:** +CCLK:<time> OK **Fail:** ERROR

AT+CCLK=?	**Success:** OK **Fail:** ERROR

Defined Values

Parameter	Explain
<time>	The format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (four digits), month, day, hour, minute, second and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; and range is -96 ~ +96). For instance, 6th of May 2014, 22:10:00 GMT+2 hours equal "2014/05/06,22:10:00+08"

3.8 AT+ICCID

Description

Execution command causes the TA to return the ICCID of the UICC.

Syntax

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

Defined Value

Parameter	Definition
<ICCID>	Integrated circuit card identification

3.9 AT+CBST

Description

Set command sets the UE baud rate to be used. Read command returns the current baud rate. Test command returns baud rates supported by the UE.

Syntax

Command	Response
AT+CBST=<rate>	**Success:** OK **Fail:** ERROR
AT+ CBST =?	**Success:** + CBST:(list of supported auto detectable <rate>values) **Fail:** ERROR
AT+ CBST?	**Success:** +CBST:<rate> OK **Fail:** ERROR

Defined values

Parameter	Explain
<rate>	Baud rate at which the UE will accept commands. Note: 1. If this value is 0 for set command, UE will enter auto baud rate detection mode and 'AT' or 'at' shall be sent for baud rate detection. 2. If this value is 0 for set command, the character format is forced to 8 data, none parity, 1 stop, +ICF=3, terminal has to reset to new baudrate to fire or read data from C16QS

3.10 AT+CEER

Description

Execution command causes the TA to return one or more lines of information text <report>, determined by the MT manufacturer, which should offer the users of the TA an extended report of the reason for the last unsuccessful attach.

Syntax

Command	Response
AT+CEER	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<report>	The total number of characters, including line terminators, in the information text shall not exceed 2041 characters.

3.11 AT+MEMSTATUS

Description

The execution command shows current heap memory usage. This command is only for debug purpose.

Syntax

Command	Response
AT+MEMSTATUS	**Success:** +MEMSTATUS:<curr_free_heap>,< min_free_heap> OK **Fail:** ERROR

Defined value

Parameter	Explain
<curr_free_heap>	Heap size current remained free memory size in heap
<min_free_heap>	Heap size minimum heap memory size ever remaining in heap

3.12 AT+CERTLOAD

Description

This command is common for load certificates.

Syntax

Command	Response
AT+CERTLOAD= <command: (1:write|2:read|3:delete)>,<lib: (1:tcp|2:mqtt|3:ftp|4:http)>,<type: (1:ca-cert|2:client-cert|3:priv-key)>,[cert_id: max 3] >data[max size : 4096]<Ctrl+Z|Esc>	**Success:** **If write** +Protocol type: certificate,1, cert size SAVED OK **If read** +: certificate content OK **If delete** OK **Fail:** ERROR

Defined value

Parameter	Explain
<command>	1. Write 2. Read 3. Delete
<lib>	1. TCP 2. MQTT 3. FTP 4. HTTP
<type>	1. ca-cert 2. client-cert 3. priv-key
[cert_id]	Certificate ID
<data>	Data to be sent

NOTE

- This command will be supported from the FW version 1.4.3 and above.
- This command is the common certificate loading command. This can be used instead of the protocol only certificate loading commands. They share the same memory locations.

4 Mobile Control and Status Commands

4.1 AT+CFUN

Description

Set command selects the level of functionality in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn.

Read command returns the current setting of <fun>.

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

Syntax

Command	Response
AT+CFUN=<fun>[,<rst>]	**Success:** OK **Fail:** ERROR
AT+CFUN?	**Success:** +CFUN: <fun> OK **Fail:** ERROR
AT+CFUN=?	**Success:** +CFUN: (0,1,4),(0,1) **Fail:** ERROR

Defined value

Parameter	Explanation
<fun>	0 Minimum functionality 1 Full functionality 4 Turn off RF
<rst>	0 Do not reset the MT before setting it to <fun>power level. This shall always be defaulted when <rst>is not given. 1 Reset the MT. <fun>is ignored currently. MT is "Full functionality" after reset.

4.2 AT+CPIN

Description

Set command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, 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. If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the sim.
Read command returns an alphanumeric string indicating whether some password is required or not.

Syntax

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

Defined Values

Parameter	Explain	
<pin>	Presently set PIN	
<newpin>	New PIN to be set	
<code>	READY	MT is not pending for any password
	SIM PIN	MT is waiting SIM PIN to be given
	SIM PUK	MT is waiting SIM PUK to be given
	SIM PIN2	MT is waiting SIM PIN2 to be given
	SIM PUK2	MT is waiting SIM PUK2 to be given

4.3 AT+CSIM

Description

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

This command allows a direct control of the SIM that is installed in the currently selected card slot, by a distant application on the TE.

Syntax

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

Defined value

Parameter	Explain
<length>:	Length of the characters that are sent to TE in <command> or <response> (Two times the actual length of the command or response)
<command>:	Command passed on by the MT to the SIM in the format as described in 3GPP TS 51.011 [28] (hexadecimal character format)
<response>:	Response to the command passed on by the SIM to the MT in the format as described in 3GPP TS 51.011 [28] (hexadecimal character format

NOTE

- The SIM sleep (power off) shall be disabled by AT$QCSIMSLEEP=0 (refer to 3.1.27) before entering **AT+CSIM.**

4.4 AT+CRSM

Description

By using this command instead of Generic SIM Access +CSIM, the 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. If a SIM installed in the currently selected card slot, the MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Syntax

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

Defined value

Parameter	Explain
<fileid>:	This is the identifier of an elementary datafile on SIM. Mandatory for every command except STATUS The range of valid file identifiers depends on the actual SIM and is defined in 3GPP TS 51.011 [28]. Optional files may not be present at all
<command>:	Command passed on by the MT to the SIM 176
<data>:	Information which shall be written to the SIM (hexadecimal character format)
<P1><P2><P3>	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 3GPP TS 51.011 [28]
<pathid>	Contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60]
<sw1>,<sw2>	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). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer 3GPP TS 51.011 [28]). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data is returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command

NOTE

- The SIM sleep (power off) shall be disabled by AT$QCSIMSLEEP=0 (refer to 3.1.27) before entering **AT+CRSM**.

4.5 AT$QCSIMSLEEP

Description

To activate or deactivate the SIM Sleep feature i.e., Powe Off SIM or Power On SIM.

Syntax

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

Defined value

Parameter	Definition
<mode>	0 Not allowed SIM sleep 1 Allowed SIM sleep

4.6 AT+CCIOTOPT *

Under Development

Description

The set command controls which CIoT EPS optimizations the UE indicates as supported and preferred in the ATTACH REQUEST and TRACKING AREA UPDATE REQUEST messages. The command also allows reporting of the CIoT EPS optimizations that are supported by the network.

The set command is used also to control the unsolicited result code +CCIOTOPTI. An unsolicited result code +CCIOTOPTI: <supported_Network_opt>is used to indicate the supported CIoT EPS optimizations by the network.

The read command returns the current settings for supported and preferred CIoT EPS optimizations and the current status of unsolicited result code +CCIOTOPTI.

The test command returns values supported as compound values.

Syntax

Command	Response
AT+CCIOTOPT=<n>[,<support_UE_opt>[,<preferred_ue_opt>]]	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explanation
<n>	0 Disable reporting 1 Enable reporting 3 Disable reporting and reset the parameters for CIoT EPS optimization to the default values.
<support_UE_opt>	1 Support for control plane CIoT EPS optimization 2 Support for user plane CIoT EPS optimization (not support now) 3 Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimizations
<preferred_UE_opt>	0 No preference 1 Preference for control plane CIoT EPS optimization 2 Preference for user plane CIoT EPS optimization
<supported_Network_opt>	0 No support 1 Support for control plane CIoT EPS optimization 2 Support for user plane CIoT EPS optimization 3 Support for both control plane CIoT EPS optimization and user plane CIoT EPS optimization

4.7 AT+IFC

Description

Set command sets the UE local flow control to be used.

Read command returns the current local flow control.

Test command returns local flow control supported by the UE.

Syntax

Command	Response
AT+IFC=<DCE_by_DTE>, <DTE_by_DCE>	**Success:** OK **Fail:** ERROR
AT+IFC?	**Success:** +IFC:<DCE_by_DTE>,<DTE_by_DCE> OK **Fail:** ERROR
AT+IFC=?	**Success:** +IFC:(0,2), (0,2) i.e., lists of supported<DCE by DTE> and list of supported<DTE by DCE> OK **Fail:** ERROR

Defined value

Parameter	Explain
<DCE_by_DTE>	It specifies the method to be used by the DTE to control the flow of received data from the DCE 0 None 2 RTS
<DTE_by_DCE>	It specifies the method to be used by the DCE to control the flow of transmitted data from the DTE 0 None 2 CTS

4.8 AT^SIMSWAP

Description

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

Syntax

Command	Response
AT^SIMSWAP=?	**Success:** ^SIMSWAP: (0,1) **Fail:** ERROR
AT^SIMSWAP=\<n>	**Success:** OK **Fail:** ERROR

Defined value

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

5 Network Service Commands

5.1 AT+CREG

Description

Set command controls the presentation of an unsolicited result code +CREG: <stat> .The parameters <reject_cause> and <cause_type>are sent only if available. 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. Test command returns values supported as a compound value.

Syntax

Command	Response
AT+CREG=<n>	**Success:** OK **Fail:** ERROR
AT+CREG?	**Success:** +CREG: <n>,<stat>[,[<lac>],[<ci>],[AcT>][,<cause_type>,<reject_cause> **Fail:** ERROR
AT+CREG=?	**Success:** +CREG: (range of supported <n>s) OK **Fail:** ERROR

Defined value

Parameter	Explanation
<n>	**0** Disable network registration unsolicited result code **1** Enable network registration unsolicited result code +CREG: <stat> **2** Enable network registration and location information unsolicited result code +CREG: <stat> [, [<lac>], [<ci>], [<AcT>] **3** Enable network registration, location information and cause value information unsolicited result code +CREG: <stat> [, [<lac>], [<ci>], [<AcT>]

	[, <cause_type>, <reject_cause>]]
<stat>	**0** Not registered, MT is not currently searching a new operator to register to **1** Registered, home network (not applicable) **2** Not registered, but MT is currently searching a new operator to register to **3** Registrations denied **4** Unknowns (e.g., out of GERAN/UTRAN/E-UTRAN coverage) **5** Registered, roaming (not applicable) **6** Registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN) **7** Registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN) **8** Attached for emergency bearer services only (not applicable) **9** Registered for "CSFB not preferred", home network (not applicable) **10** Registered for "CSFB not preferred", roaming (not applicable)
<tac>	Two-byte tracking area code
<ci>	Four-byte cell ID in hexadecimal format
<AcT>	Access technology of the serving cell 7 EUTRAN
<cause_type>	0 Indicates that <reject_cause>contains an MM cause value, see 3GPP TS 24.008 [8] Annex G. 1 Indicates that <reject_cause>contains a manufacturer specific cause
<reject_cause>	Contains the cause of the failed registration. The value is of type as defined by <cause_type>.

5.2 AT+CEREG

Description

Set command controls the presentation of an unsolicited result code +CEREG: <stat>. 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. Test command returns values supported as a compound value.

Syntax

Command	Response
AT+CEREG=\<n>	**Success:** OK **Fail:** ERROR
AT+CEREG?	**Success:** **When \<n>=0,1,2 or 3 and command successful:** +CEREG:\<n>,\<stat>[,[\<tac>],[\<ci>],[\<AcT>[,\<cause_type>,\<reject_cause>]]] OK **When \<n>=4 or 5 and command successful:** +CEREG:\<n>,\<stat>[,[\<tac>],[\<ci>],[\<AcT>], [\<cause_type>,\<reject_cause>[,[\<Active_Time>],[\<Periodic_TAU>]]]] OK **Fail:** ERROR
AT+CEREG=?	**Success:** +CREG: (range of supported \<n>s) OK **Fail:** ERROR

Defined value

Parameter	Explanation
\<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>[,[\<tac>],[\<ci>],[\<AcT>]] **3** Enable network registration, location information and EMM cause value information unsolicited result code +CEREG:\<stat>[,[\<tac>],[\<ci>],[\<AcT>][,\<cause_type>,\<reject_cause>]] **4** For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG:\<stat>[,[\<tac>],[\<ci>],[\<AcT>][,,[,[\<Active-Time>],[\<Periodic-TAU>]]]] **5** For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG:\<stat>[,[\<tac>],[\<ci>],[\<AcT>][,[\<cause_type>],[\<reject_cause>][,[\<Active-Time>],[\<Periodic-TAU>]]]]
\<stat>	**0** Not registered, MT is not currently searching an operator to register to

	1 Registered, home network
	2 Not registered, but MT is currently trying to attach or searching an operator to register to
	3 Registration denied
	4 Unknown (e.g. out of E-UTRAN coverage)
	5 Registered, roaming
	6 Registered for "SMS only", home network (not applicable)
	7 Registered for "SMS only", roaming (not applicable)
	8 Attached for emergency bearer services only (not applicable)
	9 Registered for "CSFB not preferred", home network (not applicable)
	10 Registered for "CSFB not preferred", roaming (not applicable)
<tac>	Two-byte tracking area code
<ci>	Four-byte E-UTRAN cell ID in hexadecimal format
<AcT>	Integer type: Indicates the access technology of the serving cell **0** GSM (not applicable) **1** GSM Compact (not applicable) **2** UTRAN (not applicable) **3** GSM w/EGPRS (not applicable) **4** UTRAN w/HSDPA (not applicable) **5** UTRAN w/HSUPA (not applicable) **6** UTRAN w/HSDPA and HSUPA (not applicable) **7** E-UTRAN **8** EC-GSM-IoT (A/Gb mode) (not applicable) **9** E-UTRAN (NB-S1 mode)
<cause_type>	Integer type: indicates the type of <reject_cause> **0** Indicates that <reject_cause> contains an EMM cause value **1** Indicates that <reject_cause> contains a manufacturer-specific cause value
<reject_cause>	Integer type: contains the cause of the failed registration. The value is of type as defined by <cause_type>
<Active_Time>	String type: one byte in an 8-bit format. Requested Active Time value (T3324) to be allocated to the UE. (e.g. "00100100" equals 4 minutes).Bits 5 to 1 represent the binary coded timer value. Bits 6 to 8 defines the timer value unit for the GPRS timer
<Periodic_TAU>	String type: one byte in an 8-bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. (e.g. "01000111" equals 70 hours). Bits 5 to 1 represent the binary coded timer value. Bits 6 to 8 define the timer value unit

5.3 AT+COPS

Description

The set command forces an attempt to select and register the network operator using the SIM selected currently. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper>. If the selected operator is not available, no other operator shall be selected. The selected operator name format shall also apply to further read commands (AT+COPS?). The selected mode affects all further network registration. This command should be abortable when registration/deregistration attempt is made.

The read command returns the current mode, the currently selected operator, and the current access technology. If no operator is selected, <format>, <oper> and <AcT> are omitted.

The test command returns a set of five parameters, each representing an operator present in the network.

Syntax

Command	Response
AT+COPS=<mode> [, <format>[,<oper>[,<AcT>]]]	**Success:** OK **Fail:** ERROR
AT+COPS?	**Success:** +COPS: <mode>[,<format>,<oper>[,< 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	Explanation
<mode>	0: Automatic(<oper>field is ignored) 1: Manual(<oper>field shall be present, and <AcT>is optional) - Note: <format> set to 2 is only supported in this case 2: Deregister from network 3: Set only <format>(for read command AT+COPS?), do not attempt to register/deregister (<oper>and <AcT>fields are ignored);

	4: Manual/automatic (<oper>field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered; -Note: <format> set to 2 is only supported in this case
<format>	0: Long format alphanumeric <oper> 1: Short format alphanumeric <oper> 2: Numeric <oper>
<oper>	<format>indicates if the format is alphanumeric or numeric; long alphanumeric format can be up to 16 characters long and short format up to 8 characters; numeric format is the location area identification number which consists of a three BCD digit ITU-T country code coded, plus a two or three BCD digit network code, which is administration specific.
<stat>	0: Unknown 1: Available 2: Current 3: Forbidden
<Act>	7: E-UTRAN

5.4 AT+CLCK

Description

Execute command is used to lock, unlock, or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Test command returns facility values supported as a compound value.

Syntax

Command	Response
AT+CLCK=<fac>,<mode>[,<passwd>]	**Success:** OK **Fail:** ERROR
AT+CLCK=?	**Success:** (list of supported<fac>s) OK **Fail:** ERROR

Defined Value

Parameter	Explain
<fac>	SC SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued
<mode>	0 Unlock 1 Lock 2 Query Status
<status>	0 Not Active 1 Active
<password>	Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD

5.5 AT+CNUM

Description

Action command returns the MSISDNs (up to 4) related to the subscriber stored in the SIM.

Syntax

Command	Response
AT+CNUM	**Success:** [+CNUM: [<alpha>], <number>, <type>] [+CNUM:[<alpha>], <number>, <type>] [...] OK **Fail:** ERROR
AT+CNUM=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<alpha>	Optional alphanumeric string associated with <number>
<number>	Phone number of format specified by <type>

<type>	Type of address octet in integer format (refer 3GPP TS24.008 subclause 10.5.4.7), e.g., 129 Unknown type 145 International type (use "+" for international access code) 161 National type

5.6 AT+CSQ

Description

The execution command returns received signal quality `<rssi>` and channel bit error rate `<ber>` from the MT. Please refer to Chapter 4 for possible `<err>` values.The test command returns values supported as compound values.

Syntax

Command	Response
AT+CSQ	**Success:** +CSQ:<rssi>, <ber> OK **Fail:** ERROR

Defined values

Parameter	Explanation
<rssi>	0 113dBm or less 1 -111dBm 2...30 -109...-53 dBm 31 -51 dBm or greater 99 not known or not detectable
<ber>	0...7 as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99 not known or not detectable NOTE: The AT also could be executed while USIM is not inserted.

5.7 AT+CTZR

Description

This set command controls the time zone change event reporting. If reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>, +CTZE: <tz>,<dst>,[<time>], or +CTZEU: <tz>,<dst>,[<utime>]whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. Read command returns the current reporting settings in the MT. Test command returns supported <reporting>-values as a compound value.

Syntax

Command	Response
AT+CTZR=<reporting>	**Success:** OK **Fail:** ERROR
AT+CTZR?	**Success:** +CTZR:<reporting> OK **Fail:** ERROR
AT+CTZR=?	**Success:** +CTZR: (lists of supported <reporting>s) OK **Fail:** ERROR

Defined value

Parameter	Explain
<reporting>:	0. Disable time zone change event reporting. 1. Enable time zone change event reporting by unsolicited result code 2. Enable extended time zone and local time reporting by unsolicited result code +CTZE: <tz>,<dst>,[<time>]. 3. Enable extended time zone and universal time reporting by unsolicited result code +CTZEU: <tz>, <dst>, [<utime Add a note as Reporting mode 2 is not supported
<tz>:	Representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "±zz", expressed as a fixed width, two-digit integer with the range -48 ... +56. To maintain a fixed width, numbers in the range -9 ... +9 are expressed with a leading zero, e.g., "-09", "+00" and "+09"
<dsf>:	, indicating whether <tz> includes daylight savings adjustment. 0 <tz> includes no adjustment for Daylight Saving Time 1 <tz> includes +1-hour (equals 4 quarters in <tz>) adjustment for daylight saving time 2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time
<time>	Value representing the local time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The local time can be derived by the MT from information provided by the network at the time of delivering time zone information and is present in the unsolicited result code for extended time zone and local time reporting if the universal time is provided by the network.
<utime>	Value representing the universal time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The universal time can be provided by the

	network at the time of delivering time zone information and is present in the unsolicited result code for extended time zone and universal time reporting if provided by the network.

5.8 AT+CTZU

Description

Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned. Read command returns the current settings in the MT. Test command returns supported on- and off-values as a compound value.

Syntax

Command	Response
AT+CTZU=<onoff>	**Success:** OK **Fail:** ERROR
AT+CTZU?	**Success:** +CTZU:<onoff> OK **Fail:** ERROR
AT+CTZU=?	**Success:** +CTZU: (lists of supported <onoff>s) OK **Fail:** ERROR

Defined values

Parameter	Explain
<onoff>	**0**: Disable automatic time zone update via NITZ. **1**: Enable automatic time zone update via NIT

5.9 AT+CESQ

Description

The execution command returns received signal quality parameters. Since it only supports Cat.1, <rxlev>and <ber>are set to value 99, <rscp>and <ecno>is set to 255. The test command returns values supported as compound values.

Syntax

Command	Response
AT+CESQ	**Success:** +CESQ:<rxlev>, <ber>, <rscp>, <ecno>, <rsrq>, <rsrp> OK **Fail:** ERROR

Defined value

Parameter	Explanation
<rxlev>	99 not known or not detectable
<ber>	99 not known or not detectable
<rscp>	255 not known or not detectable
<ecno>	255 not known or not detectable
<rsrq>	0 rsrq<-19.5dB 1 -19.5dB<=rsrq<-19dB 2 -19dB<=rsrq<-18.5dB . . 32 - 4dB<=rsrq<-3.5dB 33 -3.5dB<=-3 dB 34 -3 dB <=rsrq 255 not known or not detectable
<rsrp>	0 rsrp<-149dBm 1 -140dBm<=rsrp<-139dBm 2 -139dBm<=rsrp<-138dBm .. 95 -46dBm<=rsrp<-45dBm 96 -45dBm<=rsrp<-44dBm 97 -45dBm<=rsrp<-44dBm 255 not known or not detectable

5.10 AT+PING

Description

The command sends an ICMP packet to the specified host address. AT+PING initiates the sending of a PING packet with payload size: <size> to the specified address. This will either cause a packet to be returned if the remote system is connected and responding to PING packets or no response is received. If none of the response packet received within the timeout period<timeout>. It will continue to send PING packets till number of times <count> is met.

The test command returns values supported as a compound value.

Syntax

Command	Response
AT+PING=<"remote_address">[,<timeout (1~255)>[,<packet_length (ipv4 36~1500 | ipv6 56~1500)>[,<ping_count (1~65535)>]]]	**Success:** OK **Fail:** ERROR
AT+PING=?	**Success:** +PING: <"remote_address">[,<timeout (1~255)>[,<packet_length (ipv4 36~1500 | ipv6 56~1500)>[,<ping_count (1~65535)>]]] OK **Fail:** ERROR

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

NOTE

When one PING reply received in <timeout>, an unsolicited result code:
- AT+PING: SUCC, dest:<dest_ip_addr>, RTT:<rtt_time>ms will sent to TE
- If no PING reply received in <timeout>, an unsolicited result code: AT+PING: FAIL, dest:<dest_ip_addr>, timeout: <timeout>ms will sent to TE.
- If this is an ERROR meet during PING procedure, an unsolicited result code: AT+PING: ERROR, cause: <cause> will sent to TE.
- When PING procedure is done, an unsolicited result code: AT+PING: DONE<CR><LF>AT+PING:dest: <dest_ip_addr>, <count>packets transmitted,<reply_count> received, <lost_percent>% packet loss<CR> rtt min/avg/max=<rtt_min>/<rtt-_avg>/<rtt_max> ms will sent to TE.

5.11 AT+CSCON

Description

The set command controls the presentation of an unsolicited result code +CSCON. The read command returns the status of result code presentation and an integer <mode> which shows whether the MT is currently in idle mode or connected mode. Test command returns supported values as a compound value.

Syntax

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

Defined Values

Parameter	Explain
<n>	**0** Disable unsolicited result code **1** Enable unsolicited result code +CSCON:<mode>
<mode>	Indicates the signaling connection status **0** Idle **1** Connected

5.12 AT+CPWD

Description

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

Defined values

Parameter	Explain
<fac>:	SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)
<oldpwd> <newpwd>:	<oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD <newpwd> is the new password, maximum length of password can be determined with <pwdlength>
<pwdlength>:	maximum length of the password for the facility

5.13 AT+CCHO

Description

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

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

Syntax

Command	Response

AT+CCHO=<dfname>	**Success:** <sessionid> OK **Fail** ERROR
AT+CCHO=?	**Success:** OK **Fail** ERROR

Defined value

Parameter	Explain
<dfname>	All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes.
<sessionid>	A session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism.

5.14 AT+CCHC

Description

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

Syntax

Command	Response
AT+CCHC=<sessionid>	**Success** +CCHC OK **Fail** ERROR
AT+CCHC=?	**Success** OK **Fail** ERROR

Defined Value

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

5.15 AT+CGLA

Description

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

This command allows a direct control of the currently selected UICC by a distant application on the TE.

Although Generic UICC Logical Channel Access command +CGLA allows TE to take control over the UICC-MT interface, there are some functions of the UICC-MT interface that logically do not need to be accessed from outside the TA/MT. Moreover, for security reason the network authentication should not be handled outside the TA/MT.

Syntax

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

Defined value

Parameter	Explain
<length>:	Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response).
<sessionid>:	This is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").
<command>	Command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 (hexadecimal character format)
<response>	Response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 (hexadecimal character format)

5.16 AT+CRCES

Description

This command returns the coverage enhancement status of the MT. The terminal can consider the coverage enhancement status prior to deciding to transmit data. Depending on the coverage enhancement status the terminal can refrain from transmitting data. The coverage enhancement status is only provided by the MT if the access technology of the serving cell is E-UTRAN, EC-GSM-IoT or E-UTRAN (NB-S1 mode). If the access technology of the serving cell is different, <Act>=0 is indicated.

Syntax

Command	Response
AT+CRCES=<reporting>	**Success** +CRCES: <AcT>, <CE_level>, <CC> **Fail** ERROR
AT+CRCES=?	**Success** OK **Fail** ERROR

Defined value

Parameter	Explain
<AcT>:	; access technology of the serving cell. 0 Location disclosure allowed. 1 E-UTRAN 2 EC-GSM-IoT (A/Gb mode) 3 E-UTRAN (NB-S1 mode)
<CE_level>:	; Coverage Enhancement (CE) level of the MT in the serving cell. Applicable only if <Act>=3 (E-UTRAN) or <Act>=3 (E-UTRAN). 0 No Coverage Enhancement in the serving cell 1 Coverage Enhancement level 1 2 Coverage Enhancement level 2 3 Coverage Enhancement level 3 4 Coverage Enhancement level 4 5 Coverage Enhancement level 5

5.17 AT+PINGSTOP

Description

This command stops sending ping packets.

Syntax

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

6 Packet Domain Commands

6.1 AT+CGDCONT

Description

To set or read the PDP context parameters for each all-local context IDs<cid>. Specification of security protected transmission of ESM information possible to if PCO includes info that requires ciphering. The test command returns the list of all parameters and the limit of <cid>s supported.

Syntax

Command	Explain
AT+CGDCONT=<cid>[,<PDP_type>[,APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]]]]]	**Success:** OK **Fail:** ERROR
AT+CGDCONT?	**Success:** +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>]]]]]]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>]]]]]]] [...]] OK **Fail:** ERROR
AT+CGDCONT=?	**Success:** +CGDCONT: (range of supported <cid>s), <PDP_type>, (list of supported <d_comp>s), (list of supported <h_comp>s), (list of supported <IPv4AddrAlloc>s), (list of supported <request_type>s), (list of supported <PCSCF_discovery>s), (list of supported <IM_CN_Signalling_Flag_Ind>s), (list of supported

	<Local_Addr_Ind>s), [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s), (list of supported <request_type>s), (list of supported <PCSCF_discovery>s), (list of supported <IM_CN_Signalling_Flag_Ind>s), (list of supported [...]] **Fail:** ERROR

Defined Value

Parameter	Explain
<cid>	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 is returned by the test form of the command. <cid> values of 1-15 are supported.
<PDP_type>	Specifies the type of packet data protocol. The default value is manufacturer specific. IP Internet Protocol IPV6 Internet Protocol, version 6 IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability
<APN>	A logical name that is used to select the GGSN or the external packet data network. The max length is 99 characters;
<PDP_addr>	Identifies the MT in the address space applicable to the PDP.
<d_comp>	Not Applicable
<h_comp>	Not Applicable
<IPv4AddrAlloc>	Control how the MT/TA requests to get the IPv4 address information 0 IPv4 address allocation through NAS signaling 1 IPv4 address allocated through DHCP
<request_type>	Indicates the type of PDP context activation request for the PDP context 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network 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
<P-CSCF_discovery>	Influences how the MT/TA requests to get the P-CSCF address 0 Preference of P-CSCF address discovery not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signaling 2 Preference of P-CSCF address discovery through DHCP
<IM_CN_Signalling_Flag_Ind>	Indicates to the network whether the PDP context is for IM CN subsystem- related signaling only or not

	0 UE indicates that the PDP context is not for IM CN subsystem- related signaling only
	1 UE indicates that the PDP context is for IM CN subsystem-related signaling only
	0 Indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT.
	1 Indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signaling low priority"
	0 Security protected transmission of PCO is not requested
	1 Security protected transmission of PCO is requested
	0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT
	1 Preference of IPv4 MTU size discovery through NAS signaling
<Local_Addr_Ind>	Indicates to the network whether or not the MS supports local IP address in TFTs 0 Indicates that the MS does not support local IP address in TFTs 1 Indicates that the MS supports local IP address in TFTs

6.2 AT+CGATT

Description

The set command is used to attach the MT to, or detach the MT from, the Packet Domain service. Any active PDP contexts are automatically deactivated when the attachment state changes to detached.

The read command returns the current Packet Domain service state.

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

Syntax

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

Defined Values

Parameter	Explain
<state>	Indicates the state of PS attachment 0 Detached 1 Attached

6.3 AT+CGACT

Description

The set command is used to activate or deactivate the specified PDP context. 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=<state>, [<cid>]	**Success:** OK **Fail:** ERROR
AT+CGACT?	**Success:** [+CGACT: <cid><state>] +CGACT:<cid>, <state>, [...]] OK **Fail:** ERROR
AT+CGACT=?	**Success:** +CGACT: (list of supported <state>s) OK **Fail:** ERROR

Defined Values

Parameter	Explain
<state>	Indicates the activation state of PDP context activation. 0 Deactivated 1 Activated
<cid>	; specifies a particular PDP context definition. Only one <cid> can be activated or deactivated at the same time. <cid> values of 1-15 are supported. <cid>cid that defined in +CGDCONT/+CGDSCONT

NOTE

- <cid> must be specified, just not support to activate/deactivate all defined/activated bearers.
- Not support to specify several <cid>s, just not support: AT+CGACT=<state>, <cid>,<cid>[,..].

6.4 AT+CGPADDR

Description

The execution command returns a list of PDP addresses for the specified context identifiers. If no <cid> is specified, the addresses for all defined contexts are returned. The test command returns a list of defined <cid>s

Syntax

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

Defined Values

Parameter	Explain
<cid>	; specifies a particular PDP context definition (see the +CGDCONTcommands). <cid>values of 1-15 are supported.
<PDP_addr_1> **<PDP_addr_2>**	<PDP_addr_1>and <PDP_addr_2>: each is a that identifies the MT in the address space applicable to the PDP. 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. The string is given as dot-separated numeric (0-255) parameter of the form: a1.a2.a3.a4 for IPv4 and a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16 for IPv6.

6.5 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 EPS for routing of packets onto different QoS flows towards the TE. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index>that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

The set command specifies a Packet Filter 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>.

At any time, there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. The read command returns the current settings for all Packet Filters for each defined context.The test command returns values supported as compound values. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP only.

Syntax

Command	Response
AT+CGTFT=<cid>,[<packet filter identifier>,<evaluation procedure 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>[,<flow label (ipv6)>[,<direction>]]]]]]]]]	**Success:** OK **Fail:** ERROR
AT+CGTFT?	**Success:** [+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 **Fail:**

	ERROR
	Success: +CGTFT: <PDP_type>, (list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s)
AT+CGTFT=?	[<CR><LF>+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask/ traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s) [...] OK **Fail:** ERROR

Defined Values

Parameter	Explain
<cid>	Specifies a particular PDP context definition <cid>values of 1-15 are supported.
<packet filter identifier>	Value range is from 1 to 16.
<evaluation precedence index>	The value range is from 0 to 255.
<remote address and subnet mask>	The string is given as dot-separated numeric (0-255)

<protocol number (ipv4) / next header (ipv6)>	Value range is from 0 to 255.
<local port range>	The string is given as dot-separated numeric (0-65535)
<remote port range>	The string is given as dot-separated numeric (0-65535)
<ipsec security parameter index>	Numeric value in hexadecimal format
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	The string is given as dot-separated numeric (0-255)
<flow label (ipv6)>	Numeric value in hexadecimal format
<direction>	Specifies the transmission direction in which the packet filter shall be applied. Pre-Release 7 TFT filter Uplink Downlink Bidirectional (Up & Downlink)

6.6 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 (see 3GPP TS 24.301 [83] and 3GPP TS 23.203 [85]). The read command returns the current settings for each defined QoS. The test command returns the ranges of the supported parameters as compound values.

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=?	Success: +CGEQOS: (range of supported <cid>s),(list of supported <QCI>s) **Fail:** ERROR

Defined Values

Parameter	Explain
<cid>	Specifies a particular EPS Traffic Flows definition in EPS and PDP context definition. <cid>values of 1-15are supported.
<QCI>	Specifies a class of EPS QoS 0 QCI is selected by network [1-4] Value range for guaranteed bit rate Traffic Flows 75 Value for guaranteed bit rate Traffic Flows [5-9] Value range for non-guaranteed bit rate Traffic Flows 79 Value for non-guaranteed bit rate Traffic Flows
<DL_GBR>	Indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<UL_GBR>	Indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<DL_MBR>	Indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<UL_MBR>	Indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI

6.7 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 Packet Domain PDP types. This may include performing a PS attach and one PDP context activations.

<cid> should be specified (see the +CGDCONT) in order to provide the information needed for the context activation request.

The test command is used for requesting information on the supported <L2P> protocols.

Syntax

Command	Response
AT+CGDATA=<L2P>,<cid>	**Success:** OK **Fail:** ERROR

	Success: +CGDATA:(list of supported <L2P>s) OK **Fail:** ERROR
AT+CGDATA=?	

Defined Values

Parameter	Explain
<L2P>	Indicates the layer 2 protocol to be used between the TE and MT. M-PT QTI specified protocol – PDP Type, such as IP/IPV6/IPV4V6/Non-IP
<cid>	Specifies a particular PDP context definition. <cid>values of 1-15 are supported.

NOTE

- This AT command is not fully followed the 3GPP 27.007, execution command just trigger MT to activate a PDP context, just same as: +CGACT=1,<cid>
- If PDP activation success, MT issues the result code: OK, not: CONNECT, as not support V.250 online data state now

6.8 AT+CGCONTRDP

Description

The execution command returns the relevant information for an active non-secondary PDP context with the context identifier <cid>. If the MT has dual stack capabilities, at least one pair of lines with information is returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If this MT with dual stack capabilities indicates more than more than two IP addresses of DNS servers, multiple of such pairs of lines are returned. If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned. The test command returns a list of <cid>s associated with active non secondary contexts.

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>[,<PCSCF_prim_addr>[,<PCSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]] [<CR><LF>+CGCONTRDP: <cid>,<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>[,<LIPA_indication>]]]]]]]]] [...]] OK **Fail:** **ERROR**
AT+CGCONTRDP=?	**Success:** +CGCONTRDP: (list of <cid>s associated with active contexts) OK **Fail:** ERROR

Defined Value

Parameter	Explain
<cid>	; specifies a particular non secondary PDP context definition. <cid> values of 1-15 are supported.
<bearer_id>	; identifies the bearer.
<apn>	; a logical name that was used to select the GGSN or the external packet data network.
<local_addr_and_subnet_mask>	; shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255)
<DNS_prim_addr>	; the IP address of the primary DNS server.
<DNS_sec_addr>	; the IP address of the secondary DNS server.
<P_CSCF_prim_addr>	; shows the IP address of the primary P- CSCF server.
<P_CSCF_sec_addr>	; shows the IP address of the secondary P- CSCF server.
<IM_CN_Signalling_Flag>	; shows whether the PDP context is for IM CN subsystem-related signalling only or not.
<LIPA_indication>	; indicates that the PDP context provides connectivity using a LIPA PDN connection.

6.9 AT+CGSCONTRDP

Description

Read command returns information of the active non-secondary PDP context associated to the <cid>. If dual stack supported, show both IPv4 and IPv6 parameters. IPv4 shown first followed by IPv6 if more than two IP address of DNS server present, shows multiple lines of the data. Test command returns list of all <cid> having active non-secondary contexts

Syntax

Command	Response
AT+CGSCONTRDP[=<cid>]	**Success:** [+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_ Signalling_Flag>[,<WLAN_Offload>[,<PDU_sess ion_id>,<QFI>]]]] [<CR><LF>+CGSCONTRDP: <cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>[,<WLAN_Offload>[,< PDU_session_id>,<QFI>]]] OK **Fail:** ERROR
AT+ CGSCONTRDP =?	+CGSCONTRDP: (list of <cid>s associated with active contexts)

Defined Value

Parameter	Explain
<cid>	Specifies a particular EPS Traffic Flows definition in EPS and PDP context definition. <cid> values of 1-15 are supported.
<pcid>	Specifies the primary default eps bearer id of current secondary pdp < pcid > values of 1-15 are supported.
<bearer_id>	Identifies the bearer, EPS Bearer <bearer_id> values of 5-15 are supported.
<IM_CN_Signalling_Flag>	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 current default is 0.
<WLAN_Offload>	It indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not Not support
<PDU_session_id>	Identifies the PDU session Not support
<QFI>	Identifies the QoS flow Not support

6.10 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].. 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 modes of operation as a compound value

Syntax

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

Defined value

Parameter	Explain
<mode>	Indicates the mode of operation. The default value is manufacturer specific
	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

6.11 AT+CGCMOD

Description

The execution command is used to modify the specified PDP context with request to QoS profiles and TFTs. The test command returns a list of <cid>s associated with active contexts.

Syntax

Command	Response
AT+CGCMOD=<cid>	**Success** OK **Fail** ERROR
AT+CGCMOD=?	**Success** +CGCMOD: (list of <cid>sassociated with active contexts) OK **Fail**

	ERROR

Defined Values

Parameter	Explain
\<cid\>	Specifies a particular PDP context definition. \<cid\> values of 1-15 are supported.

6.12 AT+CGEQOSRDP

Description

The execution command returns the quality of service parameters \<QCI\>,[\<DL_GBR\> and \<UL_GBR\>] and [\<DL_MBR\> and \<UL_MBR\>] of the active secondary or non- secondary PDP context associated to the provided context identifier \<cid\>.

If the parameter \<cid\> is omitted, the quality-of-service parameters for all secondary and non-secondary active PDP contexts are returned.

The test command returns a list of \<cid\>s associated with secondary or non-secondary active PDP contexts.

Syntax

Command	Response
AT+CGEQOSRDP [=\<cid\>]	**Success:** +CGEQOSRDP: \<cid\>,\<QCI\>,[\<DL_GBR\>,\<UL_GBR\>],[\<DL_MBR\>,\<UL_MBR\>][\<DL_AMBR\>,\<UL_AMBR\>] [\<CR\>\<LF\>+CGEQOSRDP: \<cid\>,\<QCI\>,[\<DL_GBR\>,\<UL_GBR\>],[\<DL_MBR\>,\<UL_MBR\>][\<DL_AMBR\>,\<UL_AMBR\>] [...]] OK **Fail:** ERROR
AT+CGEQOSRDP=?	**Success:** +CGEQOSRDP: (list of \<cid\>s associated with active contexts) OK **Fail:** ERROR

Defined Values

Parameter	Explain
\<cid\>	Specifies a particular PDP context definition (see the +CGDCONT commands). \<cid\>values of 1-15 are supported.

<QCI>	Specifies a class of EPS QoS 0 QCI is selected by network [1-4] Value range for guaranteed bit rate Traffic Flows 75 Value for guaranteed bit rate Traffic Flows [5-9] Value range for non-guaranteed bit rate Traffic Flows 79 Value for non-guaranteed bit rate Traffic Flows [128-254] Value range for Operator-specific QCIs
<DL_GBR>	Indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<UL_GBR>	Indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<DL_MBR>	Indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<UL_MBR>	Indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI
<DL_AMBR>	Indicates DL APN aggregate MBR. The value is in kbit/s.
<UL_AMBR>	Indicates UL APN aggregate MBR. The value is in kbit/s.

6.13 AT+CGAPNRC

Description

This execution command returns the APN rate control parameters (see 3GPP TS 24.008 [8]) associated to the provided context identifier <cid>. If the parameter <cid>is omitted, the APN rate control parameters for all active PDP contexts are returned.

The test command returns a list of <cid>s associated with secondary and non- secondary active PDP contexts.

Syntax

Command	Response
AT+CGAPNRC[=<cid>]	**Success** +CGAPNRC: <cid>[,<Additional_exception_reports>[,<Uplink_time_unit>[,<Maximum_uplink_rate>]]] [<CR><LF>+CGAPNRC: <cid>[,<Additional_exception_reports>[,<Uplink_time_unit>[,<Maximum_uplink_rate>]]] [...]] OK **Fail:** ERROR

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

Defined Values

Parameter	Explain
<cid>	Specifies a particular PDP context definition (see the +CGDCONT commands). <cid>values of 1-15 are supported.

<Additional_exception_reports>	Indicates whether or not additional exception reports are allowed to
	be sent when the maximum uplink rate is reached. This refers to bit 4
	of octet 1 of the APN rate control parameters IE as specified in 3GPP
	TS 24.008 [8] subclause 10.5.6.3.2.
	0 Additional_exception_reports at maximum rate reached are not
	        allowed to be sent.
	1 Additional_exception_reports at maximum rate reached are
	        allowed to be sent.

<Uplink_time_unit>	Specifies the time unit to be used for the maximum uplink rate. This refers to bits 1 to 3 of octet 1 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2. **0** unrestricted **1** minute **2** hour **3** day **4** week
<Maximum_uplink_rate>	Specifies the maximum number of messages the UE is restricted to send per uplink time unit. This refers to octet 2 to 4 of the APN rate control parameters IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.3.2

6.14 AT+CGEREP

Description

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. If a setting is not supported by the MT, ERRORor +CME ERROR:is returned.

Read command returns the current mode and buffer settings. Test command returns the modes and buffer settings supported by the MT as compound values.

Syntax

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

Defined Values

Parameter	Explain
<mode>	0 Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE
<bfr>	0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1; Only it now

6.15 +CGEV

Description

This is an unsolicited message to indicate EPS PDN connection and bearer resources operations status

Response
+CGEV:<xxxxx>

Defined Values

Parameter	Explain
+CGEV: NW PDN DEACT <cid>	The network has forced a context deactivation.
+CGEV: ME PDN DEACT <cid>	The mobile termination has forced a context deactivation.
+CGEV: ME PDN ACT <cid> [,< pdnReason >]	The ME has activated a context.
+CGEV: NW MODIFY	The network has modified a context.

<cid>,<change_reason>,<event_type>	
+CGEV: ME MODIFY <cid>,<change_reason>,<event_type>	The mobile termination has modified a context.
<cid>	The format is found in command +CGDCONT. <cid>values of 1-15 are supported.
<pdnReason>	0 IPV4 only allowed 1 IPV6 only allowed 2 Single address bearer only allowed 3 Single address bearer only allowed and active second bearer failed 4 No reason
<bearerType>	0 NULL 1 Default 2 Dedicated (Not application)
<change_reason>	A bit map that indicates what kind of change occurred. The value is determined by summing all the applicable bits. Bit 1 TFT changed Bit 2 Qos changed Bit 3 WLAN Offload changed
<event_type >	Indicates whether this is an informational event or whether the TE has to acknowledge it.

6.16 AT+CIPCA

 Description

The set command controls whether an initial PDP context (see subclause 10.1.0) shall be established automatically following an attach procedure when the UE attached to E-UTRAN with or without a PDN connection. The read command returns the current setting of the command. The test command returns values supported as a compound value.

Syntax

Command	Response
AT+CIPCA=[<n>[,<AttachWithoutPDN>]]	**Success** OK **Fail** ERROR
AT+CIPCA?	**Success** +CIPCA: <n>[,<AttachWithoutPDN>] OK **Fail** ERROR

AT+CIPCA=?	**Success**
	+CIPCA: (list of supported <n>s),(list of supported <AttachWithoutPDN>s)
	OK
	Fail
	ERROR

Defined value

Parameter	Explain
<n>:	Activation of PDP context upon attach.
	i0 Do not activate
	1 Always Activate
	2 Active when not roaming
	3 No change in current setting
<AttachWithoutPDN>:	EPS Attach with or without PDN connection
	0 EPS Attach with PDN connection
	1 EPS Attach without PDN connection

6.17 AT+CGAUTH

Description

Set command allows the TE to specify authentication parameters for a PDP   context identified by the (local) context identification parameter <cid> used during the PDP context activation and the PDP context modification procedures. Since the <cid> is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, +CGAUTH is effectively as an extension to these commands. Refer subclause 9.2 for possible <err> values. The read command returns the current settings for each defined context. The test command returns values supported as compound values

Syntax

Command	Response
AT+CGAUTH=<cid>[,<auth_proto><userid>[,<password>]]]	**Success:**
	OK
	Fail:
	+CME ERROR: <err>
AT+CGAUTH?	**Success:**
	+CGAUTH:<cid>,<auth_proto>,<userid>,Response
	+CGAUTH:<cid>,<auth_proto>,<userid>,<password>
	+CGAUTH:<cid>,<auth_proto>,<userid>,<password>[...]]
	OK
	Fail:
	+CME ERROR: <err>

AT+CGAUTH=?	+CGAUTH: (range of supported<cid>s),(list of supported<auth_proto>s),(range of supported<userid>s),(range of supported<password>s)

Defined values

Parameter	Explain
<cid>:	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 is returned by the test form of the command. the command. <cid> values of 1-15 are supported.
<auth_proto>	0 None. Used to indicate that no authentication protocol is used for this PDP 1 PAP
<userid>	userId string, the max length is 20 characters with 1 line end mark
<password>	password string, the max length is 20 characters with 1 line end mark;

6.18 AT+CNMPSD

Description

This command is used to indicate the no application on the MT is expected to exchange data.

Syntax

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

NOTE

- This AT command can cause triggering of the user plane Release Assistance Indication. (NB R14 RAI feature).

6.19 AT+ICF

Description

Set command sets the UE character framing to be used. Read command returns the current character framing. Test command returns character framing supported by the UE.

Syntax

Command	Response
AT+ICF=<format> [, <parity>]	**Success:** OK **Fail:** ERROR
AT+ICF?	**Success:** +ICF:<format>,<parity> OK **Fail:** ERROR
AT+ICF=?	**Success:** +ICF:<format>,<parity> OK **Fail:** ERROR

Defined values

Parameter	Explain
<format>:	It determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame 1 8 Data; 2 Stop 2 8 Data; 2 Stop, 1parity 3 8 Data; 1 Stop 4 7 Data; 2 Stop 5 7 Data; 1 Stop, 1 Parity 6 7Data; 1 Stop
<parity>	It determines how the parity bit is generated and checked if present 0 Odd 1 Even

7 TCP/IP Commands

Only one SSL session is allowed at a time in C16QS.

7.1 AT+CIPMUX

Description

This command is used to start Up Multi-IP Connection

Syntax

Command	Response
AT+CIPMUX=<connection_mode>	**Success:** OK **Fail:** ERROR
AT+CIPMUX?	**Success:** +CIPMUX: <n> **Fail:** ERROR

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

7.2 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?	**Success:** +CIPTKA:<mode>,<keepIdle>,<keepInterval>,<keepCount> OK **Fail:** ERROR

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

7.3 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],	**Success:** **CIPMUX=0** CONNECTOK +CIPSTART: *Connection number*

[ca_cert_id],[client_cert_id],[prv_key_id]		OK **CIPMUX=1** CONNECT OK +CIPSTART: *Connection number* OK **Fail:** ERROR
Single mode	**AT+CIPSTART =?**	**Success:** +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 **Fail:** ERROR
Multi-mode	**AT+CIPSTART =?**	**Success:** +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 **Fail:** ERROR

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).

7.4 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)*>** Or **AT+CIPSTATUS**	**Success:** **CIPMUX=1** +C:Connection_number(0-7),-1,(TCP/UDP),Domain IP,Port,status OK -- C:0,-1,<type>,<IPaddress>,<Port>,<State> .... C:7..................................... OK **Fail:** ERROR
When CIPMUX=0 (Single-mode) **AT+CIPSTATUS**	**CIPMUX=0** STATUS:<state> OK **Fail:** ERROR

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

7.5 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?	**Success:** +CIPSPRT: <send prompt> OK **Fail:** ERROR

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.

7.6 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?	**Success:** CIPQSEND: <n> OK **Fail:** ERROR

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>.

7.7 AT+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?	**Success:** +CIPATS: <mode>, <time> OK **Fail:** ERROR

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.

7.8 AT+CIPSEND

Description

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

Syntax

Command	Response
When +CIPMUX=0, AT+CIPSEND	**Success:** > *Your message* (*type data to be sent*) tap CTRL+Z or ESC to send When +CIPQSEND=0

	SEND OK When +CIPQSEND=1 DATA ACCEPT:\<length\> **Fail:** When +CIPQSEND=0 ERROR When +CIPQSEND=1 SEND FAIL
When +CIPMUX=1, AT+CIPSEND=\<connection_number\> [,\<length \>] > Your message	**Success:** **CIPMUX=0** SEND OK OK **CIPMUX=1** connection number, SEND OK OK **Fail:** ERROR
AT+CIPSEND=?	**Success:** **CIPMUX=0** +CIPSEND: \<connection_number\>,length OK **CIPMUX=1** +CIPSEND: \<connection_number\>,\<length\> OK **Fail:** ERROR

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\> (1-20480)
\<connection_number\>	The connection number

NOTE

- +CIPSEND 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.
- When the TCP connection is in multi-IP mode (CIPMUX=1), default connection number chosen for AT+CIPSEND is 0.
  Eg:
  AT+CIPSEND
  >
  Hello
  +CIPSEND 0, SEND OK /// Message sent through connection number 0
- If the content/message length is specified then Ctrl+Z or 0x1A is read as a character and data send occurs automatically sent only after receiving the specified data length.
- Maximum content size for message from FW version 1.4.1 is 20480 and the previous versions can be 4096.

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

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 incoming 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.

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

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>

7.11 AT+CIPMODE

Description

This command is used to select TCP Application Mode.

Syntax

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

	ERROR

Defined value

Parameter	Explain
< tcpip_application_mode >	**0**: Normal mode **1**: Transparent mode
< urc_enable_or_disable (0~1)>	**0**: Enable URCs to be displayed **1**: Disable URCs from being displayed
<server_limit(0~1)>	**0**: No limit **1**: Limited to one server

7.12 AT+CIPSERVER

Description

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

Syntax

Command	Response
AT+CIPSERVER=<server_mode>, [port],[server_num], [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)], [server_num(0~1)],[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.
[server_num]	0: First server(S0)

	1: Second server(S1)
<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

NOTE

- Using the command AT+CIPSERVER two server can be setup for TCP, ensure that AT+CIPMUX=1.
- While connecting the servers(S0,S1) to the clients(C0 to C7) connection will be in descending order i.e the first incoming client will be C7, second will be C6 etc.

7.13 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

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

7.14 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?	**Success:** • PrimaryDns: <pri_dns> • SecondaryDns: <sec_dns> OK **Fail:** ERROR

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.

7.15 AT+CIPSHUT

Description

This command is used to Disconnect Wireless Connection

Syntax

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

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.

7.16 AT+NETIF

Description

This command is used to show Net Interface Information

Syntax

Command	Response
AT+NETIF?	**Success:** default netif:<netif> [<netif0>: inet4 addr: <IP address> inet4 gw addr: <IP address> inet4 mask addr: <IP address> inet4 dns1 addr: <IP address> inet4 dns2 addr: <IP address> inet6 addr: <IP address> inet6 gw addr: <IP address> inet6 mask addr: <IP address> inet6 dns1 addr: <IP address> inet6 dns2 addr: <IP address> OK **FAIL:** ERROR
AT+NETIF=?	**Success:** +NETIF:<if_name> **Fail:** ERROR

AT+NETIF? will provide result only after successful internet connection.

7.17 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=?	**Success:** +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 **Fail:** ERROR

Defined value

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

7.18 AT+CIPRXMODE

Description

This command is used to set TCP data streaming either to the AT port or to a local file.

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

7.19 AT+TCPFMT

Description

This command is used to change the streaming data type

Syntax

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

AT+TCPFMT =?	+TCPFMT:<mode(0~2)> OK

Defined value

Parameter	Explain
<mode>	0: ASCII 1: Hex 2: Raw

7.20 AT+CIPFLNAME

Description

This command is used to assign File Name to the file into which the incoming data has to be stored.

Syntax

Command		Response
AT+CIPFLNAME="<filename>",<file_size>		**Success:** OK **Fail:** ERROR
Single mode	**AT+CIPFLNAME=?**	+CIPFLNAME:<filename>,[file_size(byte)] 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 20KB if blank and max value is 40KB. Upon reaching file_size limit, data will be discarded

Example

AT+CIPFLNAME="File1"

OK

7.21 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)>,[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.

7.22 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

7.23 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**

8 MQTT Commands

Only two MQTT sessions are allowed to be active at the same time in C16QS

8.1 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

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

8.2 AT+MQTTLIMIT

Description

This command is used to set the maximum possible data size for an MQTT message.

Syntax

Command	Response
AT+MQTTLIMIT= <limit (0:4KB Msg, n : n*10KB Msg)>	**Success:** AT+MQTTLIMIT =1 OK **Fail:** ERROR

Defined value

Parameter	Explain
0	Maximum size is 4KB
n = 1, n*10=10KB	Possible to share maximum 10KB sized data.
n = 2, n*10=20KB	Possible to share maximum 20KB sized data.

🎯 **NOTE**

- Changing the limit after establishing a connection disconnects the current connection and delete the MQTT ID.

- This command will be supported from the FW version 1.4.2 and above.

- When the limit is increased to 10KB or 20KB, only one MQTT Client ID can be generated. Trying to generate more will return ERROR.

8.3 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>

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)

![target icon] **NOTE**

- Though we can create 3 MQTT IDs at the same time, we can establish only 2 MQTT sessions simultaneously.

8.4 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

Defined value

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

8.5 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

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 the <qos> as it would result in errors.

8.6 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: 1024) **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

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

8.7 AT+MQTTPUB

Description

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

Syntax

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

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 flag of MQTT 0: Don't duplicate 1: Duplicate
<retain>	Retain flag of MQTT 0: Don't retain 1: Retain
[message_id]	Message ID

8.8 AT+MQTTPUBLM

Description

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

Syntax

Command	Response
AT+MQTTPUBLM=<client_id>, <topic>,<qos>,,<retain>, [message_size],[message_id] *Your large message (max size:n)* **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

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 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. Maximum size varies with MQTTLIMIT set
[message_id]	Message ID

⊙ **NOTE**

- From the FW version 1.4.2 it is Possible to share data with a maximum size of 20KB.

8.9 AT+MQTTPUBLT

Description

This command is used to publish large topic.

Syntax

Command	Response
AT+MQTTPUBLT=<client_id>,<message>, <qos>,,<retain> , [message_id] *Your large topic (max size: 1024)* **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

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 flag of MQTT **0**: Don't duplicate **1**: Duplicate
<retain>	Retain flag of MQTT **0**: Don't retain **1**: Retain
[message_id]	Message ID

8.10 AT+MQTTPUBLTLM

Description

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

Syntax

Command	Response
AT+MQTTPUBLTLM=<client_id>,<qos>, , <retain>,[message_size], [message_id] *Your large topic (max size: 1024)* **Ctrl+Z|Esc** to publish the topic *Your large message (max size: n)* **Ctrl+Z|Esc** to publish the message	**Success:** +MQTTPUBLTLM: <client_id>: PUBLISHING +MQTTPUBLTLM: <client_id>:PUBLISH SUCCESS OK **Fail:** +MQTTPUBLTLM: <client_id>: PUBLISHING +MQTTPUBLTLM: <client_id>: PUBLISH FAIL

Defined value

Parameter	Explain
<client_id>	Token assigned to actual client ID
<qos>	quality of service values includes 0, 1, 2
	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. Maximum possible size depends on the MQTTLIMIT set
[message_id]	Message ID

NOTE

- If the content/message length is specified then Ctrl+Z or 0x1A is read as a character and data send occurs automatically sent only after receiving the specified data length.

8.11 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

Defined value

Parameter	Explain
<client_id>	client ID

8.12 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

Defined value

Parameter	Explain
<client_id>	client ID

8.13 AT+MQTTSLOAD

Description

This command is used to load a MQTTS certificate

Syntax

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

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
Max size: n	Varies according to MQTTLIMIT that has been set

8.14 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

Defined value

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

NOTE

- Only one SSL session is allowed at a time in C16QS

9 HTTP Commands

9.1 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:** ERROR

Defined value

Parameter	Explain
URL	The url link

9.2 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

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

Defined value

Parameter	Explain
<field>	Field of HTTP(s) header

9.3 AT+HTTPCONTENT

Description

This command adds the content to HTTP request.

Syntax

Command	Response
AT+HTTPCONTENT=[length(20480)]<Ctrl+Z|Esc>	**Success:** OK **Fail:** ERROR
AT+HTTPCONTENT=?	**Success:** +HTTPCONTENT:[length(0-20480)]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

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

NOTE

- Maximum data size for message from FW version 1.4.3 is 20480 and the previous versions can be 4096.

- If the content length is specified then Ctrl+Z or 0x1A is read as a character and data send occurs automatically sent only after receiving the specified data length

9.4 AT+HTTPREQUEST

Description

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

Syntax (Above version 1.4.3)

Command	Response
AT+HTTPREQUEST=<method:GET|POST|HEAD>	**Success:** HTTPSEND: SUCCESS **Fail:** HTTPSEND: FAIL
AT+HTTPREQUEST=?	**Success:** +HTTPREQUEST:<method:GET|POST|HEAD> 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

Syntax (With version 1.4.3)

Command	Response
AT+HTTPREQUEST=<method:GET|POST|HEAD>, [store response to flash(1 : true, 0 ; false)], [ca-cert id], [client-cert id], [priv-key id]	**Success:** HTTPSEND: SUCCESS **Fail:** HTTPSEND: FAIL
AT+HTTPREQUEST=?	**Success:** +HTTPREQUEST:<method:GET|POST|HEAD>, [store response to flash(1 : true, 0 ; false0], [ca-cert id], [client-cert id], [priv-key id] OK

	Fail: ERROR

Defined value

Parameter	Explain
<method:GET|POST|HEAD>	Send HTTP(s) GET request Send HTTP(s) POST request Send HTTP(s) HEAD request
[store response to flash]	0 ; False 1 ; True
[ca-cert id]	CA certificate
[client-cert id]	Client certificate
[priv-key id]	Private key

9.5 AT+HTTPGETSTAT

Description

Get response status of a request

Syntax

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

9.6 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

9.7 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

9.8 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<1~2147483647>] 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

9.9 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

9.10 AT+HTTPCLEAN

Description

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

Syntax

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

9.11 AT+HTTPSLOAD

Description

This command is used to load HTTPS certificate.

Syntax

Command	Response
AT+HTTPSLOAD= <Command: (1: write | 2: read | 3: delete)>, <type: (1 : ca-cert | 2 : client-cert | 3 : priv-key)>, [cert_id: max 3] >data[max size : 4096]<Ctrl+Z|Esc>	**Success:** **If write** +HTTPSLOAD: certificate,1,cert size SAVED OK **If read** +HTTPSLOAD: certificate content OK **If delete** OK **Fail:** ERROR

Defined value

Parameter	Explain
<command>	1. Write 2. Read 3. Delete
<type>	1. ca-cert 2. client-cert 3.priv-key
[cert_id]	Certificate ID

<data>	Data to be sent

9.12 AT+HTTPFLNAME

Description

To name and create a or select an existing file into which data is to be downloaded or from which the data is to be read.

Syntax

Command	Response
AT+HTTPFLNAME=<filename>, [max size]	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Explain
<filename>	Name of the file
[max size]	Maximum size of the file 100KB

9.13 AT+HTTPDOWNLOAD

Description

To download data from the URL entered

Syntax

Command	Response
AT+HTTPDOWNLOAD=<url>	**Success:** +HTTPDOWNLOAD: SUCCESS OK **Fail:** ERROR

Defined value

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

NOTE

- Maximum file size is 100KB.

9.14 AT+HTTPFLINFO

Description

To get the information regarding the file selected using the HTTPFLNAME command

Syntax

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

9.15 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

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.

9.16 AT+HTTPFLDEL

Description

To delete the file that was created for download.

Syntax

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

10 MS Commands

Possible only on uSIM

uSIM operator must support SMS over LTE using SG-SMS (I.e. SMS over NAS)

10.1 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.

You need to change the expected character set (AT+CSCS) to the correct setting for the command to work.

Syntax

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

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)

10.2 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:** +CMGR:<index><stat><alpha><da><oa><dt><scts> <fo><pid><dcs><vp><mn><mr><ra><toda><tora><tooa>

	<sca><tosca><length><data><pdu><sn><st><mis><page><pages> 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

10.3 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** **1**	PDU mode Text mode

10.4 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.

10.5 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.

10.6 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:** +CMGW:<index><oa><da><toda><tooa><stat><length> 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.

10.7 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:** +CMSS:<index><da><toda><mr> 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.

10.8 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) **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).

10.9 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

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).

10.10 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

Defined value

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

10.11 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

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

10.12 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

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>

10.13 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.

10.14 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) **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>,<lengt h>]*<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>	• 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). • TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.

10.15 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

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).

10.16 AT+CMT

Description

SMS-DELIVERs are routed directly to the TE using unsolicited result code.
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

10.13 AT+CSCS

Description

This AT Command queries and sets the character set used by the mobile terminal equiment

Syntax

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

AT+CSCS?	**Success:** +CSCS: "<n>" OK **Fail:** **ERROR**

Defined value

Parameter	Explain
<n>	"GSM" - 7-bit default alphabet "IRA" - International Reference Alphabet "UCS2" - 16-bit Universal Multiple-Octet Coded Character set

NOTE

- If alphabetic data or ASCII is to be sent, "GSM" or "IRA" Character set is to be selected. If not, the AT+CMGS command will return ERROR

11 CMUX Commands

11.1 AT+CMUX

Description

To enable CMUX mode in the C16QS AT UART

Syntax

Command	Note
AT+CMUX=1	**Once fired, the device waits for Hex code for MUX channel initialization**

NOTE

- AT command with SABM CMUX frame should be used for configuring CMUX functionality

- AT Commands should be in hexadecimal format frame and print will also be in hexadecimal format frame.

- For all details about command parameters, frame format, and other details, see **3GPP TS 27.010.**

- Please refer C16QS CMUX Application Note for more information

12 FTP COMMANDS

12.1 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

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 certification ID

[client_cert_id]	Client certificate ID
[client_key_id]	Client key ID

🎯 NOTE

- From the FW version 1.4.1 it is Possible to share data with maximum size of 20KB.
- File mode in TCP and FTP cannot operate simultaneously. Only one can be used at a time
- From FW version 1.4.1 it is possible to download / store a file up to 120KB

12.2 AT+CFTPSIZE

Description

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

Syntax

Command	Response
AT+CFTPSIZE=<filepath >	**Success:** OK **Fail:** ERROR

Defined value

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

12.3 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:** +CFTPGET;<filename>,<data_size>,[data] OK **Fail:** ERROR

Defined value

Parameter	Explain
<filepath>	Remote file path
[offset]	Remote file offset for file reading
[size]	Remote size
[slave]	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 (Max: 20kB)
[data]	Data current event if local_filename not set

12.4 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:** +CFTPPUT;<filename>,<data_size> OK **Fail:** ERROR

Defined value

Parameter	Explain
<filepath>	Remote file path
[append]	Flag for appending
[length]	Data size to be sent
[local_filename]	Filename for sending local file
<filename>	Remote filename
<datasize>	Sent data size (Max: 20kB)
[data]	Data to be sent

12.5 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:** +CFTPPUT;<filename>,<data_size> OK **Fail:** ERROR

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]	Used to specify data length before sending data instead of sending
[data]	Data to be saved

12.6 AT+CFTPFLLIST

Description

This command is used for listing local files.

Syntax

Command	Response
AT+CFTPLLIST	**Success:** +CFTPFLLIST:<filename> OK **Fail:** ERROR

Defined value

Parameter	Explain
<filename>	Local file name

12.7 AT+CFTPFLINFO

Description

This command is used to get local file size.

Syntax

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

Defined value

Parameter	Explain
<filename>	Local file name

12.8 AT+CFTPFLREAD

Description

This command is used for reading local file.

Syntax

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

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

12.9 AT+CFTPFLWRITE

Description

This command is used to write local file.

Syntax

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

Defined value

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

12.10 AT+CFTPFLRENAME

Description

This command is used to rename local file

Syntax

Command	Response
AT+CFTPFLRENAME=<Current_name>,<new_name>	**Success:** OK

	Fail:
	ERROR

Defined value

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

12.11 AT+CFTPFLDEL

Description

This command is used to delete the local file.

Syntax

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

Defined value

Parameter	Explain
<file_name>	Local file name

13 GNSS Commands

13.1 AT+CGPS

Description

This command is used to start/stop GNSS Functionality.

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

Syntax

Command	Response
AT+CGPS=<on/off>	**Success** OK **Fail** ERROR
AT+CGPS=?	**Success** +CGPS<0-1> OK **Fail:** ERROR

Defined value

Parameter	Values	Explain
<on/off>	0-1	**0** OFF: Stop GPS session **1** ON: Start GPS session

13.2 AT+CGPSRST

Description

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

Syntax

Command	Response
AT+CGPSRST	**Success** OK **Fail** ERROR
AT+CGPSRST=?	**Success** +CGPSRST OK **Fail** ERROR

13.3 AT+CGPSGPOS

Description

Gives the response associated with the needed Positional Parameter

Syntax

Command	Response
AT+CGPSGPOS=?	**Success:** +CGPSGPOS: <1-5> OK **Fail:** ERROR
AT+CGPSGPOS= <n>	**Success:** +[Type denoted by n]: <Response format of the queried Type> OK **Fail:** ERROR

Defined value

Parameter	Explain
<n>	Type of Positional Parameter (1-5)

1: GNGGA	Time, Position and Fix data +GNGGA: hhmmss.sss, ll.llll,a,yyy.yyyy,a,x,xx,x.xx,x.x,M,x.x,M,x.x,xxxx*hh
2: GNGSA	Dilution of Precision and Active Satellites provided +GNGSA: a,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.xx,x.xx,x.xx,h*hh
3: GPGSV	The number of GNSS satellites in view, PRN, elevation, azimuth, and SNR +GPGSV: x,x,xx,xx,xx,xxx,xx,................,xx,xx,xxx,xx,h*hh
4: GBGSV	The number of BeiDou satellites in view, PRN, elevation, azimuth, and SNR +GPGSV: x,x,xx,xx,xx,xxx,xx,................,xx,xx,xxx,xx,h*hh
5: GNRMC	Recommended minimum specific GNSS data, i.e., position, SOG, COG, and time +GNRMC: hhmmss.sss,A,ll.llll,a,yyy.yyyy,a,x.xx,x.xx,xxxxxx,x.x,a,a,a*hh

13.4 AT+GPSPORT

Description

To enable/disable stream onto the AT Port

Syntax

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

Defined value

Parameter	Values	Explain
<mode>	0-1	**0** Disable stream into AT port **1** Enable stream into AT port

NOTE

- The baud rate for streaming will remain the same as the currently set baud rate of the AT port

14 Extended GNSS Commands

14.1 AT+CGPSHOT

Description

This command is used to get a Hot Start. Use the available data in the NVRAM.

Syntax

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

14.2 AT+CGPSWARM

Description

This command is used to get a Warm Start without using Ephemeris data at the start.

Syntax

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

14.3 AT+CGPSCOLD

Description

This command is used to enable Cold Start. Thus, the Position, Almanac and Ephemeris data are not used at the start.

Syntax

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

14.4 AT+CGPSAGNSS

Description

This command is used to enable the AGNSS functionality of the GNSS chip.

Syntax

Command	Response
AT+CGPSAGNSS=<n>	**Success:** OK **Fail:** ERROR

Defined Values

Parameter	Values	Explain
<n>	1-3	**1** AGNSS with Hot Start **2** AGNSS with warm Start **3** AGNSS with cold start

🎯 **NOTE**

Ensure that AGNSS functionality is enabled and successful before firing **AT+CGPSVERIFY.**

14.5 AT+CGPSVERIFY

Description

This command is used to verify whether data from AGNSS server has been obtained and successfully flashed into chip.

Syntax

Command	Response
AT+CGPSVERIFY=<n>	**Success:** $AIDNF: Memory locations in hex OK **Fail:** ERROR

Example

AT+CGPS=1
OK
AT+CGPSAGNSS=1
OK
AT+CGPSVERIFY
$AIDINFO,0x00F7DC0000,0x00F7DC0000,0x1FBFFCBFFF,0x1FBFFCBFFF,,,,,0x0003*25 OK

NOTE

- A successful response of **AT+CGPSVERIFY** will have memory locations in hex format.

- Response of **AT+CGPSVERIFY** will not be in the form
  $AIDINFO,0x00000000000x0000000000,0x0000000000,0x0000000000,,,,,0x0000*26

NOTE

- For successful execution of these commands, one must leave the GNSS_RXD pin (pin 83) as floating. Else the commands will return ERROR

15 Power Saving Commands

15.1 AT+CPSMS

Description

The set command controls the setting of the UE's power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not. Please refer to the unsolicited result codes provided by AT+CEREGfor the active time value and the extended periodic TAU value that are allocated to the UE by the network in E- UTRAN.

A special form of the command can be given as AT+CPSMS=2. In this form, the use of PSM is disabled and data for all parameters in the command +CPSMSis removed.

The read command returns the current parameter values.

The test command returns the supported <mode>s and the value ranges for the requested extended periodic TAU value in E-UTRAN and the requested Active Time value as compound values.

Syntax

Command	Response
AT+CPSMS=<mode>[,<Requested_Periodic - RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]	**Success** OK **Fail** ERROR
AT+CPSMS	**Success** +CPSMS:<mode>,[<Requested_Periodic-RAU>], [<Requested_GPS-READY-timer>], [<Requested_Periodic-TAU>] , [<Requested_Active-Time>] **Fail** ERROR
AT+CPSMS=?	**Success** +CPSMS: (list of supported <mode>s),(list of supported <Requested_Periodic_RAU>s,list of supported<Requested_GPS-READY-timer>s),(list of supported <Requested_Periodic-TAU>s,list of supported <Requested_Active-Time>s) OK **Fail** ERROR

Defined value

Parameter	Explanation
\<mode\>	0 Disable the use of PSM 1 Enable the use of PSM Removed Mode 2
\<Requested_Periodic-RAU\>	; not supported by Cat.1
\<Requested_GPRS-READY-timer\>	; not supported by Cat.1
\<Requested_Periodic-TAU\>	; one byte in an 8-bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E- UTRAN. (e.g. "01000111" equals 70 hours). Bits 5 to 1 represent the binary coded timer value Bits 6 to 8 define the timer value unit as follows: Bits 8 7 6 0 0 0 Value is incremented in multiples of 10 minutes 0 0 1 Value is incremented in multiples of 1 hour 0 1 0 Value is incremented in multiples of 10 hours 0 1 1 Value is incremented in multiples of 2 seconds 1 0 0 Value is incremented in multiples of 30 seconds 1 0 1 Value is incremented in multiples of 1 minute 1 1 0 Value is incremented in multiples of 320 hours 1 1 1 Value indicates that the timer is deactivated The default value is 20 hours
\<Requested_Active-Time\>	one byte in an 8-bit format. Requested Active Time value (T3324) to be allocated to the UE. e.g. "00100100" equals 4 minutes). Bits 5 to 1 represent the binary coded timer value. Bits 6 to 8 defines the timer value unit for the GPRS timer as follows: Bits 8 7 6 0 0 0 Value is incremented in multiples of 2 seconds 0 0 1 Value is incremented in multiples of 1 minute 0 1 0 Value is incremented in multiples of decihours 1 1 1 Value indicates that the timer is deactivated The default value is 5 minutes

15.2 AT+CEDRXS

Description

The set command controls the setting of the UE's eDRX parameters. It can be used to control whether the UE wants to apply eDRX or not, as well as the requested eDRX value for Cat.1.

A special form of the command can be given as AT+CEDRXS=3. In this form, eDRX is disabled and data for all parameters in AT+CEDRXS command are removed.

The set command also controls the presentation of an unsolicited result code

+CEDRXP:\<AcTtype\>[,\<Requested_eDRX_value\>[,\<NW-provided_eDRX_value\>[,\<Paging_time_window\>]]]

when <n>=2 and there is a change in the eDRX parameters provided by the network. The read command returns the current settings for each defined value of <AcT-type>.

The test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values.

Syntax

Command	Response
AT+CEDRXS=<mode>,<AcT-type>[,<Requested_eDRX_value>]	**Success** OK **Fail** ERROR
AT+CEDRXS?	**Success:** +CEDRXS:<AcT-type>,<Requested_eDRX_value> OK **Fail:** ERROR
AT+CEDRXS=?	**Success:** +CEDRXS: (list of supported <mode>s),(list of supported <AcT-types>s),(list of supported <Requested_eDRX_values>s) **Fail:** ERROR

Defined value

Parameter	Explanation
<mode>	; indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode>will take effect for all specified values of <AcT-type>. 0 Disable the use of eDRX 1 Enable the use of eDRX 2 Enable the use of eDRX and enable the unsolicited result code:+CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] 3 Disable the use of eDRX and discard all parameters for eDRX
<AcT-type>	; indicates the type of access technology. AT+CEDRXS?is used to specify the relationship between the type of access technology and the requested eDRX value. 0 Access technology is not using eDRX. This parameter value is only used in the unsolicited result code. 4 E-UTRAN (WB-S1 mode)
<Requested_eDRX_value>	; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. (e.g."0010" equals 20.48 seconds)

<NW-provided_eDRX_value>	; half a byte in a 4-bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element. (e.g."0010" equals 20.48 seconds)
<Paging_time_window >	; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element. (e.g."0000" equals 2.56 seconds)

15.3 AT+CEDRXRDP

Description

The execution command returns <AcT-type>, <Requested_eDRX_value>, <NW- provided_eDRX_value> and <Paging_time_window>. If eDRX is used for the cell that the UE is currently registered to. If the cell that the UE is currently registered to is not using eDRX, <AcT-type>=0is returned.

Syntax

Command	Response
AT+CEDRXRDP	**Success** +CEDRXRDP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] OK **Fail** ERROR

Defined value

Parameter	Explanation
<AcT-type>	0 Access technology is not using eDRX 4 E-UTRAN (WB-S1 mode)
<Requested_eDRX_value>	; half a byte in a 4-bit format. (e.g."0010" equals 20.48 seconds)
<NW-provided_eDRX_value>	; half a byte in a 4-bit format. (e.g."0010" equals 20.48 seconds)
<Paging_time_window>	; half a byte in a 4-bit format. (e.g."0000" equals 2.56 seconds)

15.4 AT+PMUCFG

Description

To set the PMU mode.

Syntax

Command	Response
AT+PMUCFG=<enable>,[<mode>]	**Success:** OK **Fail:** ERROR
AT+PMUCFGP?	**Success:** +PMUCFG: <enable>, [<mode>] OK Note: If PMU is disabled, <mode> is not returned **Fail:** ERROR
AT+PMUCFGP=?	**Success**: +PMUCFG: (range of supported <enable>s), (list of supported <mode>s) OK **Fail:** ERROR

Defined value

Parameter	Definition	
<enable>	; specifies to enable PMU or not	
	0	Disables the PMU, <mode>is ignored and only enter idle
	1	Enable the PMU
	The default value is 1	
<mode>	; specifies to depth of sleep mode	
	0	Active
	1	Idle
	2	Sleep1
	3	Sleep2
	4	Hibernate
	The default value is 1	

16 Qualcomm Proprietary Commands

16.1 AT$QCBAND

Description

To set/get the bands list to be/being used by the UE. It can also list out all the bands supported by the UE

Syntax

Command	Response
AT$QCBAND=<band1>[,<band2>[,<band3>...]]	**Success:** OK **Fail:** ERROR
AT$QCBAND?	**Success:** $QCBAND: <band1>[,<band2>[,<band3>[..]]] OK **Fail:** ERROR
AT$QCBAND=?	**Success:** Response: $QCBAND: (list of supported <band> s) OK **Fail:** ERROR

Defined value

Parameter	Definition
<band>	Band list in decimal number.

16.2 AT$QCWIFISCAN

Description

The execution command is used for detecting Wi-Fi-SSID information. Set command sets the Wi-Fi detect parameters to be used. Read command returns the current Wi-Fi scan parameters. Test command returns Wi-Fi scan range parameters supported by the UE

This command is not supported in C16QS

Syntax

Command	Response
AT$QCWIFISCAN=[<time>,[<round>],[<maxbssidnum>] , [<scantimount>] ,[<priority>]	**Success:** $QCWIFISCAN : <ecn> , <ssid>, <rssi>,<mac>,<channel> OK **Fail:** ERROR
AT$QCWIFISCAN?	**Success:** $QCWIFISCAN: <time>,<round>,<maxbssidnum>,<scantimeout>,<priority> OK **Fail:** ERROR
AT$QCWIFISCAN=?	**Success:** $QCWIFISCAN :(4000-255000),(1-3),(4-10),(1-255),(0-1) OK **Fail:** ERROR

Defined value

Parameter	Definition
<time>	Unit milliseconds. The value is max response time of Wi-Fi scan. Default value is 12000
<maxbssidnum>	The value is the max required Wi-Fi SSid number. Default value is 5.
<round>	The value is max number of Wi-Fi scan round. Default value is 1.
<scantimeout>	. Unit second. The value is max search time per Wi-Fi scan round. Default value is 3.
<priority>	The value is the priority of Wi_Fi scan . [0 means data preferred; 1 means Wi-Fi preferred] Default value is 0.

🎯 **NOTE**

- CAVWIFISCAN AT could be executed in CFUN0/CFUN4/NO-USIM/Normal State.
- Wi-Fi scan only could be executed while PHY in idle state. If the priority is set to 0 and UE in connection state, UE doesn't start the Wi-Fi scan procedure until UE returns back to idle state. If the priority is set to 1 and UE in connection state, UE releases connection immediately and start the Wi-Fi scan procedure.
- <time> value should not be less than <round> multiplied by <scan timeout>
- <maxbssidnum> means the max required Wi-Fi SSID number
  - Case 1 If UE has detected the required Wi-Fi SSID, UE will stop Wi-Fi procedure and report the detected Wi-Fi result.
  - Case 2 If UE has not detected the required Wi-Fi SSID before execute time out, UE will abort Wi-Fi procedure and report the detected Wi-Fi result.
  - Case 3 The round is set to 3 and maxbssidnum is set to 10, if in the first round UE could detect five Wi-Fi SSID, in the second round UE could detect six Wi-Fi SSID , in the third round UE could detect six Wi-Fi SSID. UE will delete the duplicate Wi-Fi SSID and sort the Wi-Fi SSID by descending order then report the ten Wi-Fi SSID result.
  - This command is not supported in C16QS

16.3 AT$QCEVENTSTATIS

Description

The execution command is used to set/get UE EMM and RRC specific event statistics.

Syntax

Command	Response
AT$QCEVENTSTATIS= <mode>	**Success:** OK **Fail:** +CME ERROR : <err>
AT$QCEVENTSTATIS=?	**Success:** $QCEVENTSTATIS: list of supported <mode> OK **Fail:** ERROR
AT$QCEVENTSTATIS=?	**Success:** $QCEVENTSTATIS :<mode> $QCEVENSTATIS: RRC, ConEstSucc:<num>,ConEstFail:<num> $QCEVENSTATIS : EMM, AttachSucc:<num>, AttachFail:<num>,TAUSucc:<num>,TAUFail:<num>,SRSucc:<num>,SRFail:<num>, AuthFail:<num>, DetachNum :<num> $QCEVENSTATIS : PLMN, OOS :<num> OK

Defined value

Parameter	Definition
<mode>	0 Stop event statistic -default value 1 Start event statistic 2 Clear event statistic (Note : the mode should be executed in "UE Power Off state (AT+CFUN=0))

16.4 AT$QCSTATIS

Description

It is an action command. The execution command causes the MT to start/stop protocol statistic information reporting. The test command returns a list of supported <interval> setting.

Syntax

Command	Response
AT$QCSTATIS= <mode>	**Success:** OK **Fail:** +CME ERROR : <err>
AT$QCSTATIS=?	**Success:** $QCSTATIS: list of supported <interval>s OK **Fail:** ERROR

Defined value

Parameter	Definition
<interval>	0 Stop statistic information report (1-600) UE report statistic information in this period , value is in unit of seconds

16.5 AT$QCSENDDATA

Description

The set command could send data via control plane or user plane.

Syntax

Command	Response
	Success: OK

AT$QCSENDDATA= <cid>,<data_length>,<data>[,<RAI>[,<type_of_user_data>]]	**Fail:** +CME ERROR : <err>
AT$QCSENDDATA=?	**Success:** $QCSENDDATA: (range of supported <cid>s),(maximum number of octets of user data indicated by <data_length>),(list of supported <RAI>s),(list of supported <type_of_user_data>s) OK **Fail:** ERROR

Defined value

Parameter	Definition
<cid>	Specifies a particular PDP context definition. Note: If <cid> set to 1, just use current default bearer to send this orginating data
<data_length>	Indicates the number of octets of the <data> information of element . The max length is 950.
<data>	String of octets
<RAI>	Indicates the value of the release assistance indication 0 No information available 1. The MT expects that exchange of data is completed with the transmission of this UL packet
<type_of_user_data>	Indicates whether the user data that is transmitted is regular or exceptional. 0 Regular data 1 Exception data

NOTE

- Difference with AT+CSODCP limit to transmit data over control plane to network , but this AT don't , but this AT don't have such limitation

16.6 AT$QCAUGDCNT

Description

The command can auto save the result of AT$QCCGDNT? to NVM.

Syntax

Command	Response
AT$QCAUGDCNT=<interval>	**Success:** OK **Fail:** +CME ERROR : <err>
AT$QCAUGDCNT?	**Success:** $QCAUGDCNT: <interval> OK **Fail:** +CME ERROR : <err>
AT$QCAUGDCNT=?	**Success:** $QCAUGDCNT: (0,30-65535) OK **Fail:** +CME ERROR : <err>

Defined value

Parameter	Definition
<interval>	The interval for auto save the result of AT$QCGDCNT? unit is second. Note: Supported values: (0, 30 -65535) If the interval is set to 0 , will disable auto save function

🎯 **NOTE**

- The interval for auto save is not always strictly consistent with the user setting . For example if UE enter sleep2 or hibernate before auto save , the auto save time is postponed until wake up from sleep2 or hibernate . Also the same as AT$QCGDCNT , please use this command with caution!

16.7 AT$QCGDCNT

Description

The command can query how many bytes are sent or received by PS module.

Syntax

Command	Response
AT$QCGDCNT=<option>	**Success:** OK **Fail:** +CME ERROR : <err>
AT$QCGDCNT?	**Success:** $QCGDCNT: <bytes_sent>,<bytes_recv> OK **Fail:** +CME ERROR : <err>
AT$QCGDCNT=?	**Success:** $QCGDCNT: (0,1) OK **Fail:** +CME ERROR : <err>

Defined value

Parameter	Definition
<option>	0 Reset the data counter 1 Save the data counter to NVM
<bytes_sent>	The number of bytes sent. Note Supported values: (0 – 0xFFFFFFFFFFFFFFFF)
<bytes_recv>	The number of bytes received . Note: Supported values (0 – 0xFFFFFFFFFFFFFFFF)

NOTE

- Use this command with caution! It may cause the UE to only enter sleep2 and can't enter hibernate. In addition , frequent saving to NVM will affect the service lift. It is best to keep disabled by AT$QCCFG="EnableDataCounter" , 0 when not in use.

16.8 AT$QCSWC

Description

To enable/disable/query/reset SIM write counter. The counter record the execution o SIM erite command such as update binary and update record.

Syntax

Command	Response
AT$QCSWC=<mode>	**Success:** OK Success (<mode>=2): $QCSWC: <filename>, <counter> $QCSWC: <filename>, <counter> **Fail:** ERROR
AT$QCSWC?	**Success:** $QCSWC: <mode> OK **Fail:** ERROR
AT$QCSWC=?	**Success**: $QCSWC: (list of supported <mode>s)OK **Fail:** ERROR

Defined value

Parameter	Definition
<mode>	0 Disable the SIM write counter 1 Enable the SIM write counter 2 Query the SIM counter 3 Reset all SIM write counter as 0
<filename>	SIM EF name referred to TS31.102 "null" means no file written.
<counter>	If overflow occurs restart rom 0.

16.9 AT$QCSIMCFG

Description

To set the configuration of SIM.

Syntax

Command	Response
AT$QCSIMCFG=<mode>	**Success:** OK

	Fail: ERROR
AT$QCSIMCFG?	**Success:** $QCSIMCFG: <mode> OK
	Fail: ERROR
AT$QCSIMCFG=?	**Success:** $QCSIMCFG: (list of supported <mode>s) OK
	Fail: ERROR

Defined value

Parameter	Definition
<mode>	Name of configuration parameter. "SimSimulator" Enable/disable virtual SIM card fo instrument test, such as CMW500. Supported values: (0,1) Default value: 0 Set it, then virtual SIM or real SIM take effect by terminal reset or entering AT+CFUN=0/1 "SimPowerSave" Enable/disable SIM power save. Supoorted values: (0,1) Default values: 1 "SimPresenceDetect Enable/disable SIM presence detection. Supported values: (0,1) Default values: 1

16.10 AT$QCSIMRM

Description

Execution command causes the TA to execute SIM removal procedure.

Syntax

Command	Response
AT$QCSIMRM	**Success:** OK **Fail:** ERROR
AT$QCSIMRM=?	**Success:** OK **Fail:** ERROR

16.11 AT$QCUSATP

Description

Transmits to the MT the <profile> to modify terminal profile of USAT.

Syntax

Command	Response
AT$QCUSATP=<length>, <profile>	**Success:** OK **Fail:** ERROR
AT$QCUSATP?	**Success:** $QCUSATP: <length>, <profile> OK **Fail:** ERROR
AT$QCUSATP=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Definition
<length>	Length of the characters that are sent to TE in <profile> (two times the actual length of the command or response)

<profile>	The profile describing the supported USAT facilities as specifies for the terminal profile in 3GPP TS31.111. (Hexadecimal character format)

16.12 AT$QCFREQ

Description

The command set prefer EARFCN list, lock or unlock cell. Read command returns the current EARFCN setting. The test command returns values supported as a compound value.

Syntax

Command	Response
If cell unlock (mode = 0): **AT$QCFREQ=<mode>** If set prefer EARFCN list (mode = 1): **AT$QCFREQ=<mode>[,<earfcn1>[,<earfcn2>...]]** If cell lock (mode = 2): **AT$QCFREQ=<mode>,<earfcn>[,<phycellid>]**	**Success:** OK **Fail:** ERROR
AT$QCFREQ?	**Success:** If neither set prefer EARFCN list nor lock EARFCN/cell : OK If set prefer EARFCN list:$QCFREQ: <1>,<arfcn1>,<arfcn2>,... If lock EARFCN or lock cell: $QCFREQ: <2>,<arfcn>,<phycellid> OK If both set prefer EARFCN list and lock EARFCN/cell: $QCFREQ: <1>,<arfcn1>,<arfcn2>,... $QCFREQ: <2>,<arfcn>,<phycellid> OK **Fail** ERROR
AT$QCFREQ=?	**SUCCESS:** $QCFREQ: (list of supported <mode>s) OK **Fail:** ERROR

Defined value

Parameter	Definition
<mode>	0 -Cancell cell lock 1 - Set prefer EARFCN list 2 - EARFCN lock, or cell lock 3 - Clear prefer EARFCN
<earfcn>	E-UTRA Absolute Radio Frequency Channel Number
<phyCellid>	Physical cell ID

NOTE

- **AT$QCFREQ must be restricted to execute in power off or air plane state**

16.13 AT$QCCFG

Description

The command set UE extended configuration. The read command return current setting of each parameters. The test command returns values supported as a compound value.

Syntax

Command	Response
AT$QCCFG=<param>, <value>	**Success:** OK **Fail**: ERROR
AT$QCCFG?	**Success:** $QCCFG:<PARAM1><value1> [$QCCFG: <param2>,<value2>] [...] OK **Fail:** ERROR

AT$QCCFG=?		**Success** $QCCFG: (list of supported<param> s) OK **Fail:** ERROR

Defined value

Parameter	Definition	
	Name of configuration parameter	

	"PsSoftReset"	Whether UE support protocol stack soft reset.
		Note:
		  1. Supported values:(0,1)
		  2. Default value: 0.

	"Rohc"	Whether UE support ROHC.
		Note:
		  1. Supported values:(0,1)
		  2. Default value: 1.

<param>	"Ipv6RsForTestSim"	Whether UE trigger IPv6 NDP (RS) procedure to get IPv6 prefix address when the SIM card inserted is a TEST SIM.
		Note:
		  1. Supported values:(0,1)
		  2. Default value 0.
		  3. IPv6 NDP (RS) procedure is triggered by default if the inserted SIM card is not for testing.

	"Ipv6RsDelay"	Delay in seconds then UE trigger IPv6 NDP (RS) procedure to get IPv6 prefix address. Note:
		  1. Supported values:(0-65535)
		  2. Default value 15.
		  3. IPv6 NDP (RS) procedure is triggered by default if the inserted SIM card is not for testing

	"PlmnSearchPowerLevel"	Set the PLMN search level when UE OOS; Note: 1. Supported values: (0,1,2,3,4)

		0 - OOS PLMN search interval: 5 seconds, 10 seconds, 20 seconds
		1 - OOS PLMN search interval: 15 seconds, 30 seconds, 1 minute
		2 - OOS PLMN search interval: 5 minutes, 10 minutes, 15 minutes
		3 - OOS PLMN search interval: 30 seconds, then stop PLMN search,and let AT : AT$QCPLMNS to start PLMN search
		4 – Don't perform PLMN search when OOS, let user to decide next action(whether perform PLMN search or not) 2.Default value: 1
	"Epco"	Whether UE need to use "EPCO" in "PDN CONNECTION REQUEST" and in IE "UE network capability" carried in "ATTACH REQUEST", and "ESM INFORMATION RESPONSE"; If set to 0, just use "PCO". Note: 1. Supported values:(0,1) 2. Default value: 0
	"T3324MaxValueS"	Set user control T3324 value in second. Note: 1. Support values: (0-16777215) 2. Default value: 16777215 3. If T3324MaxValueS is smaller than 65535 and network configured T3324 is equal to or greater than T3324MaxValueS (or network not configured T3324),use the configured T3324MaxValueS 4. If T3324MaxValueS is smaller than 65535 and network configured T3324 is smaller than T3324MaxValueS , use the network configured value

		5. If T3324MaxValueS is equal to or greater than 65535,just means disable this feature(use network configured value)
	"BarValueS"	UE bar period due to SIB14. After timer expiry, UE can retry access to network. Note: 1. Supported values: (1-600) 2. Default value: 120.
	"DataInactTimer"	Set the value of "data inactivity timer" in seconds, if this timer is not configured by NW (in MAC-MainConfig), just use this setting value. Note: 1. Supported value: (0,15-255) 2. Default value: 60 3. If set to 0, just means this timer is invalid, don't need to start. 4. It must be restricted to execute in power off or air plane state
	"RelaxMonitorDeltaP"	Set the value of "SearchDeltaP" in DB for Relex-Monitor feature. If this value is not configured by NW (in SIB3), just use this setting value. Note: 1. Supported values: (0-15) 2. Default value: 6 3. It must be restricted to execute in power off or air plane state
	"UeCategory"	Set the value of UE category. Note: 1. Supported values: a. (1, cat1) b. (2, cat1-bis) 2. Default value: 1 3. It must be restricted to execute in power off or air plane state

	"RelVersion"	Set the UE release version. Note: 1. Supported values: (13,14) 2. Default value: 13 3. It must be restricted to execute in power off or air plane state
	"EnableEAB"	Enable or disable Extended Access Barring. Note: Supported values: (0,1) Default value: 1.
	"AttachEpsCid"	Set the default eps bearer context cid value Note: Supported values: (1,15) Default value: 1
	"TcpTptOpt"	Enable or disable TCP throughput optimization. Note: Supported values: (0,1) Default value: 1
	"PowerAttachWithIMSI"	Enable or disable power on ATTACH with IMSI. Note: Supported values: (0,1) Default value: 1.
	"PowerAttachWoEia"	Enable or disable power on ATTACH without integrity protected. Note: Supported values: (0,1) Default value: 1.
	"EnableDataCounter"	Enable or disable PS data counter feature. Note: 1. Supported values: (0,1) 2. Default value: 0. 3. Only enable this configuration, AT$QCGDCNT and AT$QCAUGDCNT can be executed. 4. Please enable this command with caution, it may cause the UE to only enter sleep2 and can't enter Hibernate. It's best to keep disabled when not in use.
	"UpdateLociCtrl"	Set the mode of updating EFEPSLOCI and EFLOCI to SIM. Note:

		Supported values: (0,1)
		0 - Update EFEPSLOCI and EFLOCI to SIM if the parameters are changed (EPS update status, TAI, GUTI for EFEPSLOCI; TMSI, LAI for EFLOCI).
		1 - Delay updating EFEPSLOCI and EFLOCI to SIM until do deregistration (AT+CFUN=0). Side effect in this mode: The EFs may not be updated to SIM if SIM is removed or power down UE without sending AT+CFUN=0.
		Default value: 0.
	"RoamService"	Enable or disable the roaming service. AT$QCCFG="RoamService"[,<roam_mode>[,<effect>]] Note:
		<roam_mode> Supported values: (1,2,255)
		1 – Disable roaming service.
		2,255 – Enable roaming service.
		Default value: 2.
		<effect> Supported values: (0,1)
		0 – Take effect after UE reboots
		1 – Take effect immediately
		Default value: 1
	<value>	Value of configuration

16.14 AT$QCRMFPLMN

Description

Set command remove FPLMN in NVM or SIM. The test command returns values supported as a compound value.

Syntax

Command	Response
AT$QCRMFPLMN=<mode>	**Success:** OK

	Fail: ERROR
AT$QCRMFPLMN=?	**Success:** $QCRMFPLMN: (list of supported s) OK **Fail:** ERROR

Defined value

Parameter	Definition
<mode>	0 - Remove FPLMN in NVM file and in SIM card 1 - Remove FLPMN in NVM file 2 - Remove FPLMN in SIM card

16.15 AT$QCSTATUS

Description

This action command returns some key parameter in UE side.

Syntax

Command	Response
AT$QCSTATUS	**Success:** $QCSTATUS : PHY, DlEarfcn : < dlEarfcn >, UlEarfcn : < ulEarfcn >, PCI : <pci>, Band : <band>, RSRP:<rsrp>, RSRQ:<rsrq>, SNR : <snr>, DlBler : < dlBler>, UlBler : < ulBler>, DataInactTimerS : < dataInactTimers>, RetxBSRTimerP : <retxBSRTimerP>, TAvalue:<tavalue>, TxPower<txpower> $QCSTATUS : L2, SrbNum:<srbNum>, DrbNum:<drbnum> $QCSTSTUS : RRC, State:<rrcState>, TAC:<tac>, Cell Id :<cell Id> $QCSTATUS : EMM, Emmstate : <emmState>, EmmMode : <emmMode>, PTWMs : <ptwMs>, EDRXPeriodMs : <eDRXPeriodMs>, PsmExT3412TimerS : <psmExT3412Timers>, T3324TimerS : <T3324Timers>, T3346RemainTimeS : <T3346RemainTimes> $QCSTATUS : PLMN, Plmnstate : <plmnState>, PlmnType : <plmnType>, SelectPlmn : <selectPlmn>

	$QCSTATUS : ESM, ActBearerNum:<actBearerNum>, APN:<apn>, IPv4:<ipaddr> $QCSTATUS : CCM, Cfun : <cfun>, IMSI : <imsi> OK
AT$QCSTATUS=<module>	**Success** $QCSTATUS : <module>, <name>:<value>[,<name>:<value>[,…]] OK **Fail:** ERROR
AT$QCSTATUS=?	**Success:** $QCSTATUS : (list of supported <module>s) OK **Fail:** ERROR

Defined value

Parameter	Definition
<module>	Modules of protocol statck, supported value: PHY, L2, RRC, EMM, PLMN, ESM, CCM
<dlEarfcn>	Downlink earfcn, value range is 0~262143
<ulEarfcn>	Uplink earfcn, value range is 0~262143
<pci>	Physical cell ID, value range is 0~503
<band>	Band, value range is 0~70
<rsrp>	Value in dBm, range is -156dBm ~ -44dBm
<rsrq>	Value in dB, range is -34dB ~ -2.5dB
<snr>	Value in dB, range is -20dB ~ 40dB
<dlBler>	Downlink block error, value range is 0~10000
<ulBler>	Uplink block error, value range is 0~10000
<datalnactTimerS>	Data inactive timer in seconds, value range is 0~180
<retxBSRTimerP>	Timer for BSR reporting, value in number of PDCCH periods. Value pp4 corresponds to 4 PDCCH periods, pp16 corresponds to 16 PDCCH periods and so on.
<tavalue>	Timing advance value Value range is 0~1282. -1 is invalid value
<txPower>	Current TX power level in dBm. Value range is -45~23. -128 is invalid value
<drbNum>	Value range is 0~11
<rrcState>	Value range is "DEACT","OOS","IDLE","SUSPEND IDLE"," CONNECTED","UNKONWN"
<tac>	Value range is 0~65534
<cellid>	Value range is 0~268435455

<emmState>	Value range is "NULL","DEREG"," REG INIT","REG","DEREG INIT","TAU INIT","SR INIT","UNKNOWN"
<emmMode>	Value range is "IDLE","PSM","CONNECTED", "UNKNOWN"
<ptwMs>	eDRX Paging Time Window in milliseconds
<edrxPeriodMs>	eDRX period in milliseconds
<psmExT3412TimerS>	Extended T3412 timer value in seconds
<T3324TimerS>	T3324 timer value in seconds
<T3346RemainTimeS>	If T3346 is running, set to the remaining time, else set to 0
<plmnState>	Value range is "NO PLMN", "SEARCHING", "SELECTED", "UNKNOWN"
<plmn Type>	Value range is "HPLMN", "EHPLMN", "VPLMN", "UPLMN", "OPLMN", "UNKNOWN"
<selectPlmn>	Selected PLMN
<actBearerNum>	activated bearer number
<apn>	access point name
< Ipv4Addr ipv6Addr>	Ipv4/Ipv6 address
<fun>	0 - Minimum functionality 1 - Full functionality 4 – Turn off RF
<IMSI>	International Mobile Subscriber Identity (string with double quotes)

16.16 AT$QCSIMSLEEP

Description

To allow SIM card sleep (power of SIM) or not (power on SIM).

Syntax

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

Parameter	Definition	
<mode>	0	Not allowed SIM sleep
	1	Allowed SIM sleep

Defined value

16.17 AT$QCSWC

Description

To enable/disable/query/reset SIM write counter. The counter record the execution o SIM erite command such as update binary and update record.

Syntax

Command	Response
AT$QCSWC=<mode>	**Success:** OK Success (<mode>=2): $QCSWC: <filename>, <counter> $QCSWC: <filename>, <counter> **Fail:** ERROR
AT$QCSWC?	**Success:** $QCSWC: <mode> OK **Fail:** ERROR
AT$QCSWC=?	**Success**: $QCSWC: (list of supported <mode>s) OK **Fail:** ERROR

Defined value

Parameter	Definition	
<mode>	0	Disable the SIM write counter
	1	Enable the SIM write counter
	2	Query the SIM counter
	3	Reset all SIM write counter as 0

<filename>	; SIM EF name referred to TS31.102 "null" means no file written.
<counter>	; I overflow occurs restart rom 0.

16.18 AT$QCSIMCFG

Description

To set the configuration of SIM.

Syntax

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

Defined value

Parameter	Definition	
<mode>	Name of configuration parameter.	
	"SimSimulator"	Enable/disable virtual SIM card fo instrument test, such as CMW500. d) Supported values: (0,1) e) Default value: 0 f) Set it, then virtual SIM or real SIM take effect by terminal reset or entering AT+CFUN=0/1
	"SimPowerSave"	Enable/disable SIM power save. c) Supoorted values: (0,1) d) Default values: 1
	"SimPresenceDetect	Enable/disable SIM presence detection. c) Supported values: (0,1) d) Default values: 1

16.19 AT$QCSIMRM

Description

Execution command causes the TA to execute SIM removal procedure.

Syntax

Command	Response
AT$QCSIMRM	**Success:** OK **Fail:** ERROR
AT$QCSIMRM=?	**Success:** OK **Fail:** ERROR

16.20 AT$QCUSATP

Description

Transmits to the MT the <profile> to modify terminal profile of USAT.

Syntax

Command	Response
AT$QCUSATP=<length>, <profile>	**Success:** OK **Fail:** ERROR
AT$QCUSATP?	**Success:** $QCUSATP: <length>, <profile> OK **Fail:** ERROR
AT$QCUSATP=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Definition
<length>	Length of the characters that are sent to TE in <profile> (two times the actual length of the command or response)

16.21 AT$QCDNS

Description

This command is used to get the IP address for a specific URL. As a limitation now, only one IP address is returned for a URL.

Syntax

Command	Response
AT$QCDNS=<url>	**Success:** $QCDNS:<ipaddr> OK **Fail:** ERROR
AT$QCDNS=?	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Definition
<url>	Domain name
<ipaddr>	If IPv4 type, output is dot-notation format, such as : "32.1.13.184" If IPv6 type, output is colon-notation format, such as: "2001:0DB8:0000:CD30:0000:0000:0000:0002"

16.22 AT$QCDNSCFG

Description

This command set the default DNS server addresses configuration. It is the lowest priority for DNS server addresses setting. When the DNS server address is invalid which is assigned by core network or operator default setting. The DNS server address is configured.

Syntax

Command	Response
AT$QCDNSCFG=<ipaddr>[,ipaddr2>[,<ipaddr3>[,<ipaddr4>]]]	**Success:** OK **Fail:** ERROR
AT$QCDNSCFG?	**Success:** $QCDNSFG: <ipaddr>[,ipaddr2>[,<ipaddr3>[,<ipaddr4>]]] OK

	Fail: ERROR
AT$QCDNSFG=?	Success: OK **Fail:** ERROR

Defined value

Parameter	Definition
<ippadr>	If IPv4 type, output is dot-notation format, such as : "32.1.13.184" If IPv6 type, output is colon-notation format, such as: "2001:0DB8:0000:CD30:0000:0000:0000:0002"

16.23 AT$QCPCFG

Description

The set command is used to set plat configure, if set parameter error, +CME error: <err> is returned.

Read command returns the current plat configure setting.

Syntax

Command	Response
AT$QCPCFG =<mode>,<value>	**Success:** OK **Fail:** ERROR
AT$QCPCFG?	**Success:** $QCPCFG: "faultAction":<value>,"uartDumpPort":<value>,"startWDT":<value>,"logCtrl":<value>,"logLevel":<value>,"logPortSel":<value>,:usbCtrl":<value>,"usbSwTrace":<value>,"usbSlpMask":<value>,"usbSlpThd":<value>,"pwrKeyMode":<value>,"usbNet":<value>,"fortaUrcBaudrate":<value>,"fortaUrcPortSel":<value>,"pmuInCdrx":<value> OK **Fail:** ERROR
AT$QCPCFG=?	**Success:** $QCPCFG: <option>,<setting> OK **Fail:** ERROR

Defined value

Parameter	Definition
<mode>	faultAction : Set the hardfault action mode uartDumpPort : Choose assert info dump uart port StartWDT : Set watch dog mode logCtrl : Set log print level logBaudrate : Set log print baud rate slpWaitTime : Set sleep wait time logPortSel : Set log output port usbCtrl : Set usb control mode usbNet : For USB ethernet driver configurations.
<value>	For faultAction, the values range is from 0 to 4 0: dump full exception info to flash and EPAT tool then trapped in endless loop 1: print necessary exception info then reset 2: dump full exception info to flash then reset 3: dump full exception info to flash and EPAT tool then reset 4: reset directly. Suggest set to this value when mass production stage. 10: enable uart to help dumping and dump full exception info to flash and EPAT tool then trapped in endless loop 13: enable uart to help dumping and dump full exception info to flash and EPAT tool then reset. For uartDumpPort, the values range is from 0 to 255 0-n(subject to the total number of uart port): the index of uart port through which to output dump info 255: disable this feature For startWDT, the values range is from 0 to 1 0: stop WDT 1: start WDT. Suggest set to this value when mass production stage. For logCtrl, the values range is from 0 to 2

	0: unilog is disabled
	1: only sw log is enabled
	2: All log is enabled
	0: debug log level
	2: info log level
	3: value log level
	4: warning log level
	5: error log level
	For logLevel, the values range is from 0 to 5
	0: debug log level
	2: info log level
	3: value log level
	4: warning log level
	5: error log level
	For logBaudrate, the values range is from 921600 to 6000000
	For slpWaitTime, the values range is from 0 to 0xffff
	For logPortSel, the values is from 0 to 2
	0: log is output to USB default
	1: log is output to UART0
	2: log could be output to USB and UART
	For usbCtrl, the values range is from 0 to 2
	0: usb is enabled and initialized, RNDIS is enumerated
	1: usb is enabled and initialized, RNDIS is not enumerated
	2: usb is disabled and not initialized
	For usbSwTrace, the values range is from 0 to 1
	0: disable usb software trace
	1: enable usb software trace
	For usbSlpMask, the values range is from 0 to 1

	0: usb will vote for sleep
	1: mask the usb voting result
	For usbSlpThd, the values range is from 0 to 65535
	For pwrKeyMode, the values range is from 0 to 2
	0: power key internal pull up without debounce
	1: power key internal pull up with debounce
	2: power key without internal pull up
	For usbNet the value range is from 0 and 1
	0: RNDIS
	1: ECM

🎯 **NOTE**

- For usbCtrl;
  Should not disable RNDIS in WIN PC when enable and disable RNDIS. If RNDIS is disabled in WIN PC host side, dynamic enable and disable RNDIS in UE via above AT, PC doesn't refresh the device manager and still shows RNDIS device and also affects VCOM port.
  e.g. Step1: 3VCOM ports and 1RNDIS is enumed
  Step2: disable RNDIS in WIN PC
  Step3: AT$QCPCFG=usbCtrl, 1 to disable RNDIS in UE
  Step4: after reset UE, WIN PC still show RNDIS and only 2 VCOM ports
- For usbSlpThd;
  Do not sleep when sleep time is less than usbSlpThd to avoid too much USB enumeration on PC

16.24 AT$QCUSBSYS

Description

Set command is used to set plat configure.

Read command returns the current plat configure setting.

Syntax

Command	Response
AT$QCUSBSYS =<mode>,<value>	**Success:** OK **Fail:** ERROR

AT$QCUSBSYS?	**Success:** $QCUSBSYS: "VBUSMode":<value>, "VBUSWkupPad":<value> OK **Fail:** ERROR
AT$QCUSBSYS=?	**Success:** $QCUSBSYS: <option>,<setting> OK **Fail:** ERROR

Defined value

Parameter	Definition
<mode>	VBUSModeEn : Set the VBUS Mode enable/disable VBUSWkupPad : Set VBUS Wakeup pad index
<value>	For VBUSModeEn, the values range is from 0 to 1 0: USB VBUS Mode disable 1: USB VBUS Mode enable For VBUSWkupPad, the values range is from 0 to 5 0: USB VBUS connect to wake up pad 0 1: USB VBUS connect to wake up pad 1 2: USB VBUS connect to wake up pad 2 3: USB VBUS connect to wake up pad 3 4: USB VBUS connect to wake up pad 4 5: USB VBUS connect to wake up pad 5

16.25 AT$QCSLEEP

Description

This command is used for power consumption test. After executing the command, UE will enter related low power state. And UE could be wake up by wakeup PAD, after waking up, UE will reboot.

Syntax

Command	Response

AT$QCSLEEP =\<state\>	**Success:**
	$QCSLEEP: \<mode\>
	OK
	Fail:
	ERROR
AT$QCSLEEP=?	**Success:**
	$QCSLEEP: \<state\>
	OK
	Fail:
	ERROR

Defined value

Parameter	Definition	
\<state\>	0	HIB2
	1	HIB1
	2	SLEEP2
	3	SLEEP1
	4	OFF
\<mode\>	HIB2	Hibernate2 status
	HIB1	Hibernate1 status
	SLEEP2	Sleep2 status
	SLEEP1	Sleep1 status

16.26 AT$QCSAVEFAC

Description

This command is used in production line, which saves related regions to default reliable region. e.g. after IMEI/SN was written or RF calibration was done.

Default reliable regions is used to restore factory setting.

The test command saves related regions to default reliable region.

The test command returns mode supported as a compound value.

Syntax

Command	Response
AT$QCSAVEFAC =\<mode\>	**Success:**
	OK

	Fail: ERROR
AT$QCSAVEFAC=?	**Success:** $QCSAVEFAC: <mode> OK
	Fail: ERROR

Defined value

Parameter	Definition
<mode>	"all": All regions "rfregion": Only RF regions "other": Regions except RF, currently IMEI/SN region

16.27 AT$QCTASKINFO

Description

The execution command returns all the task's name, id, status,

Syntax

Command	Response
AT$QCTASKINFO	**Success:** **$QCTASKINFO: <task_information>** OK **Fail:** ERROR

16.28 AT$QCSHOWMEM

Description

The execution command shows current heap memory usage. This command is only for debug purpose.

Syntax

Command	Response
AT$QCSHOWMEM	**Success:** $QCSHOWMEM: <curr_free_heap, min_free_heap> OK **Fail:** ERROR

Defined value

Parameter	Definition
<curr_free_heap>	0 --- heap size current remained free memory size in heap
<min_free_heap>	0 --- heap size minimum heap memory size ever remaining in heap

16.29 AT$QCSYSTEST

Description

This command is only for debug purpose.

The test command returns option supported as a compound value.

The set command triggers a test feature.

Syntax

Command	Response
AT$QCSYSTEST=?	**Success:** $QCSYSTEST: <option> OK **Fail:** ERROR
AT$QCSYSTEST=<option>	**Success:** OK **Fail:** ERROR

Defined value

Parameter	Definition
<option>	Handshake Perform handshake with UE Assert : Trigger a test assert Testwdt : Trigger watch dog test Fsaassert : Trigger file system assert for test Hardfault : Trigger a hardfault for test

16.29 AT$QCVOTECHK

Description

This command shows the current vote state, which can help to analyze the reason of sleep failure.
This command is only for debug purpose.

Syntax

Command	Response
AT$QCVOTECHK	**Success:** Sleep Vote Info: <vote info detail> OK **Fail:** ERROR

NOTE

- Vote info detail shows the comprehensive information which will affect sleep process in SDK. The detail info is separated into 5 parts.
- Part1: user set sleep depth limitation.
- Part2: EC internal sleep vote result.
- Part3: application vote result.
- Part4: user registered sleep depth callback.
- Part5: driver vote result
- Part6: cp vote result

16.30 AT$QCADC

Description

This command is used to get thermal temperature and VBAT values sampled by ADC.

Syntax

Command	Response
AT$QCADC=?	**Success:** $QCADC: <option> OK **Fail:** ERROR
AT$QCADC=<option>	**Success:** $QCADC: <option>,<value>[,<option>,<value>] OK **Fail:** ERROR

Defined value

Parameter	Definition	
<option>	temp	Get current thermal temperature in unit of degree centigrade with 1 degree resolution.
	vbat	Get current VBAT value in unit of mV
	all	Get current thermal temperature and VBAT value.
<value>	; Corresponding value of option	

16.31 AT$QCRST

Description

This command restarts the chip

Syntax

Command	Response
AT$QCRST	**Success:** OK **Fail:** ERROR

16.32 AT$QCIPR

Description

Set Command sets UE baud rate to be used. Read command returns the current baud rate. Test command returns baud rate supported by the UE.

Syntax

Command	Response
AT$QCIPR=<mode>	**Success:** OK **Fail:** ERROR
AT$QCIPR?	**Success:** $QCIPR: <rate> OK **Fail:** ERROR
AT$QCIPR=?	**Success**: $QCIPR :(list of fixed-only <rate> values) OK

Defined value

Parameter	Definition
<rate>	Baud rate at which the UE will accept commands.

16.33 AT$QCNPICFG

Description

Set command is used to set NPI config. Read command returns the current NPI config setting.

Syntax

Command	Response
AT$QCNPICFG=<option>, <setting>	**Success:** OK **Fail:** ERROR

AT$QCNPICFG?	**Success:** $QCNPICFG: "rfCaliDone":<value>,"rfNSTDone" :<value> OK
AT$QCNPICFG=?	**Success**: $QCNPICFG: <option>,<value> OK

Defined value

Parameter	Definition
<option>	String type.
	rfCalilDone : Set RFCALI process ststus
	rfNSTDone : Set RFNST process status
<setting>	For rfCaliDone , the values range is from 0 to1 0 RFCALI Set RFCALI process status 1 RFCALI process is not done
	For rfNSTDone, the values range is from 0 to 1 0 RFNST process is not done 1 RFNST process is done

16.34 AT$QCPMUSTATUS

Description

The command obtains UE last PMU status.

Syntax

Command	Response
AT$QCPMUSTATUS?	**Success:** $QCPMUSTATUS : <slpstate>,<slptime> OK **Fail:** ERROR

Defined value

Parameter	Definition
<slpstate>	Last PMU state UE entered Actv : Active State Idle state Slp1 : Sleep1 state Slp2 : Sleep2 state Hibn: hibernate state
<setting>	Last sleep duration in resolution of 125 ms , is 0 if slpststate is Actv and Idle

16.35 AT$QCNETCFG

Description

The command set the network adapter parameter configuration. Set <nat > to enable or disable NAT (Network Address Translation). When NAT is enable, configure local host IP address by <host_addr> if set or default address"192.168.10.2". When NAT is disable, configure global IP address allocated by LTE network.

Syntax

Command	Response
AT$QCNETCFG=<nat>[,<host_addr>]	**Success:** OK **Fail:** ERROR
AT$QCNETCFG?	**Success:** $QCNETCFG :<nat>,<host_addr> OK
AT$QCNETCFG=?	**Success:** $QCNETCFG : (list of supported (<nat>,<host_addr>)s) OK

Defined value

Parameter	Explain	
<nat>	0	Disable network address translation
	1	Enable network address translation
<host_addr>	Local host IP address supported by IPv4 type only Note Supported values : "192.167.a.b", a: 0-255 , b: 2-254 Default value : "192.168.10.2"	

16.36 AT$QCNETDEVCTL

Description

The command set data path control for the network adapter. Control data path open by setting <op> to bind LWIP to PDN context with <cid> . Control data path close by setting <op> to unbid LWIP to PDN context with <cid>.

Syntax

Command	Response
AT$QCNETDEVCTL=<op>,<cid>,{,<urc_en>}	**Success:** OK **Fail:** ERROR
AT$QCNETDEVCTL?	**Success:** $QCNETDEVCTL :<op>,<cid>,<urc_en>,<state> OK
AT$QCNETDEVCTL=?	**Success:** $QCNETDEVCTL : (list of supported (<op>,<cid,<urc_en>)s) OK

Defined value

Parameter	Explain
<op>	Specifies device control option 0 Unbind cid for LWIP 1 Bind cid for LWIP once and no rebind if re-activate PDN context with same cid after deactivation 2 Bind cid for LWIP and rebind if re-activate PDN context with the same cid after deactivation 3 Auto dial and bind cid when power on, saved in NVM after power down
<cid>	Specifies a Particular non secondary PDP context definition. <cid> values of 1-15 are supported.
<urc_en>	specifies whether report URC $QCNETDEVCTL : <state> 0 Disable URC $QCNETDEVCTL : <state> 1 Enable URC $QCNETDEVCTL: <state>
<state>	0 Bind cid for LWIP failure 1 Bind cid for LWIP success

NOTE

If the <cid> for PDN context defined but deactivated , bind this <cid> will auto activate PDN context. If the <cid> for PDN context undefined, bind this <cid> will cause activation failed.

16.37 AT$QCLEDMODE

Description

Set command is used to enable the netlight function, and the read command returns the whether the netlight function is enable or not.

Syntax

Command	Response
AT$QCLEDMODE=<state>	**Success:** OK **Fail:** ERROR

AT$QCLEDMODE?	**Success:**
	$QCLEDMODE: <state>
	OK
AT$QCLEDMODE=?	**Success:**
	$QCLEDMODE: (0,1)
	OK

Defined value

Parameter	Explain	
<state>	0	Netlight function disable.
	1	Netlight function enable

NOTE

Netlight is set to PAD 46 using PWM instance 3. It can be changed by rewrite NetlightInit function (in bsp_custom.c). Call NetlightInit in BSP_CustomInit to enable this function.

- Netlight function may cause extra power consumption in active state.
- Using AONIO as PWM pad may cause extra leakage in sleep state, power off AONIO(slpManAONIOpowerOff) before sleep when ther is no need to keep AON latched.
- All sleep is disabled, until NB enter idle/PSM
- A pull-down resistor is needed to keep padlow to avoid unwanted flicker.

16.38 AT$QCUBSYS

Description

Set command is used set plat configure, if set parameter error, +CME ERROR: <err> is returned. And read command returns the current plat configure setting.

Syntax

Command	Response
AT$QCUSBSYS=<mode>,<value>	**Success:**
	OK
	Fail:
	+CME ERROR: <err>

AT$QCUSBSYS?	**Success:** $QCUSBSYS: "VBUSModeEn":<value>,"VBUSWkuppad":<value> OK
AT$QCUSBSYS=?	**Success:** $QCUSBSYS: <option>,<setting> OK

Defined value

Parameter	Explain
<mode>	VBUSModeEn : Set the VBUS Mode enable/disable
	VBUSWkupPad : Set VBUS Wakeup pad index
<value>	For VBUSModeEn, the values range is from 0 to 1 0: USB VBUS Mode disable 1: USB VBUS Mode enable
	For VBUSWkupPad, the values range is from 0 to 5 0: USB VBUS connect to wake up pad 0 1: USB VBUS connect to wake up pad 1 2: USB VBUS connect to wake up pad 2 3: USB VBUS connect to wake up pad 3 4: USB VBUS connect to wake up pad 4 5: USB VBUS connect to wake up pad 5

16.39 AT$QCFSINFO

Description

The command lists file size and name, file system information including total and used space in unit of block.

Syntax

Command	Response
AT$QCFSINFO	**Success:** <file system information> OK

	Fail: ERROR

16.40 AT$QCFLASHMONITORINFO

Description

The command is used to monitor flash information.

Syntax

Command	Response
AT$QCFLASHMONITORINFO=?	**Success:** $QCFLASHMONITORINFO: (0, 1, 2, 3) OK **Fail:** ERROR
AT$QCFLASHMONITORINFO=<option>	**Success:** <monitor information> if option is 1, 2, 3 OK **Fail:** ERROR

Defined value

Parameter	Explain	
<option>	0	reset file system monitor counter
	1	show file writer counter
	2	show file system block erase counter
	3	show pmu back up raw flash erase counter

NOTE

- Macro FLASH_MONITOR_ENABLE shall be enabled for option 1 and 2

16.41 AT$QCPURC

Description

The command enable/disable platform URC (unsolicited result code) report.

Syntax

Command	Response
AT$QCPURC=<urcStr>, <value>	**Success:** OK **Fail:** ERROR
AT$QCPURC?	**Success:** $QCPURC: "HIBNATE": <value>, "SLEEP2": <value>, "SLEEP1": <value> OK **Fail:** ERROR
AT$QCPURC=?	**Success:** $QC: "Mode": (0-1) OK **Fail:** ERROR

Defined values

Parameter	Explain	
<urcSTR>	;	
	"HIBNATE"	Enable URC report when enter HIBERNATE
	"SLEEP2"	Enable URC report when enter SLEEP2
	"SLEEP1"	Enable URC report when enter SLEEP1
<value>	;	
	0	disable unsolicited result code report
	1	enable unsolicited result code report

16.42 AT$QCLOGDBVER

Description

This read command returns current unilog database version information.

Syntax

Command	Response
AT$QCLOGDBVER?	**Success:** $QCLOGDBVER: <LogDbVersion> OK **Fail:** ERROR

17 PPP Initialization

17.1 AT+PPPSTART

Description

To start the PPP server in a specific AT Port. This will turn the port from command state to data mode state

Syntax

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

NOTE

- Simply firing **AT+PPPSTART** enables the default setting for PPP
  By default the AT UART port at 115200 is set
- **LCP Termination** of the PPP session from client device will automatically revert the port from data mode state to command mode state (i.e., back to state where it accepts AT Commands). No reboot required for reverting

18 Hubble DM Commands*

* Only available from firmware version 1.1.0

18.1 AT+HUBBLEDM

Description

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

Syntax

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

Defined value

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

19 Hubble Messaging as a service*

Only available from firmware version 1.1.0

19.1 AT+HUBBLEMAAS

Description

Create Hubble Message as a Service connection.

Syntax

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

Defined value

Parameter	Explain
< execution status >	0 – Stop 1 – Start

<network type>	1 – Private
	2 - Public

🎯 **NOTE**

- The Connection must be done within 15 seconds otherwise "<execution status>" is changed to '0' (stop).
- Total of 3 chances are provided for re-connection process.

19.2 AT+HMSUB

Description

Subscribe a HUBBLEMAAS topic.

Syntax

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

Defined value

Parameter	Explain
<topic>	topic of hubblemaas
<qos>	quality of service values Ie 0, 1, 2

19.3 AT+HMUNSUB

Description

Subscribe a HUBBLEMAAS topic

Syntax

Command	Response
AT+HMUNSUB= <topic>	**Success:** +HMUNSUB: UNSUBSCRIBESUCCESS OK **Fail:** ERROR
AT+HMUNSUB=?	**Success:** +HMUNSUB: <topic> OK **Fail:** ERROR

Defined value

Parameter	Explain
<topic>	topic of hubblemaas

19.4 AT+HMSUBLT

Description

Subscribe a large HUBBLEMAAS topic.

Syntax

Command	Response
AT+HMUNSUBLT >Your large topic (max size: 1024) Ctrl+Z|Esc to publish the topic	**Success:** +HMSUB: UNSUBSCRIBING +HMSUB: UNSUBSCRIBE SUCCESS OK **Fail:** ERROR

AT+HMSUBLT=?	**Success:** +HMSUBLT: <qos> >topic[max size : 1024]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
<topic>	Topic of hubblemaas. Max size: 1024 Bytes
<qos>	Quality of service values: 0, 1, 2

19.5 AT+HMUNSUBLT

Description

Unsubscribe a large HUBBLEMAAS topic

Syntax

Command	Response
AT+HMUNSUBLT **>Your large topic (max size: 1024)** **Ctrl+Z|Esc to publish the topic**	**Success:** +HMSUB: UNSUBSCRIBING +HMSUB: UNSUBSCRIBE SUCCESS OK **Fail:** ERROR
AT+HMUNSUBLT=?	**Success:** +HMUNSUBLT: >topic[max size : 1024]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
<topic>	Topic to which subscription to be made Max size is the current maximum set using AT+HUBBLEMAAS

19.6 AT+HMPUB

Description

Publish a HUBBLEMAAS message on topic

Syntax

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

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 Ie 0, 1, 2
	duplicate flag of Hubblemaas, value inclue 0, 1
<retain>	retain flag of Hubblemaas, value Ie 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

19.7 AT+HMPUBLM

Description

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

Syntax

Command	Response
AT+HMPUBLM= <topic>,<qos>,,<retain>, [message_size],[message_id] > Your large message (max size: 4096) Ctrl+Z|Esc to publish the message	**Success:** +HMPUBLM: PUBLISHING + HMPUBLM: PUBLISH SUCCESS OK **Fail:** + HMPUBLM: PUBLISHING + HMPUBLM: PUBLISH FAIL
AT+HMPUBLM=?	**Success:** +HMPUBLM:<topic>, <qos (0~2)>,,<retain (0~1)>,[message_size],[message_id (1~65535)] >message[max size : 4096]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
<topic>	topic of MQTT, see note for max length
<qos>	quality of service value includes 0, 1, 2
	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

19.8 AT+HMPUBLT

Description

This command is used to publish large topic.

Syntax

Command	Response
AT+HMPUBLT= <message>, <qos>,,<retain> , [message_id] > Your large topic (max size: 1024) Ctrl+Z|Esc to publish the topic	**Success:** +HMPUBLT: PUBLISHING + HMPUBLT: PUBLISH SUCCESS OK **Fail:** + HMPUBLT: PUBLISHING + HMPUBLT: PUBLISH FAIL
AT+HMPUBLT=?	**Success:** +HMPUBLT: <message>,<qos (0~2)>,,<retain (0~1)>,[message_id (1~65535)] >topic[max size : 1024]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
<message>	message to publish
<qos>	quality of service value includes 0, 1, 2
****	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

19.9 AT+HMPUBLTLM

Description

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

Syntax

Command	Response
AT+HMPUBLTLM= <qos>,,<retain>, [message_size],[message_id] > Your large topic (max size: 1024) Ctrl+Z|Esc to publish the topic > Your large message (max size: 4096) Ctrl+Z|Esc to publish the message	**Success:** +HMPUBLTLM: : PUBLISHING +HMPUBLTLM: : PUBLISH SUCCESS,12 OK **Fail:** +HMPUBLTLM: : PUBLISHING +HMPUBLTLM: : PUBLISH FAIL
AT+HMPUBLTLM=?	**Success:** +HMPUBLTLM: <qos (0~2)>,,<retain (0~1)>,[message_size],[message_id (1~65535)] >topic[max size : 1024]<Ctrl+Z|Esc> >message[max size : 4096]<Ctrl+Z|Esc> OK **Fail:** ERROR

Defined value

Parameter	Explain
<qos>	quality of service values includes 0, 1, 2
****	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

19.10 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

Defined value

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

20 Hubble Registration Command

20.1 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=?	**Success:** +HUBBLEREG: <account_id>,<plan_id>[,<group_id>] **Fail:** ERROR

Defined value

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

21 DFOTA Commands*

Only available from firmware version 1.4.0

21.1 AT+DFOTADL

Description

This command is used to download the differential file from HTTP server

Syntax

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

Defined value

Parameter	Explain
<url>	The url of the server which hosts the differential firmware file

21.2 AT+DFOTINFO

Description

This command is used to verify the download binary

Syntax

Command	Response
AT+DFOTINFO	**Success:** **+DFOTINFO: <verified byte value>** **OK**

	Fail: ERROR

Defined value

Parameter	Explain
< verified byte value>	The size of the file in bytes

21.3 AT+DFOTAUG

Description

This command is used to update the firmware within the system

Syntax

Command	Response
AT+DFOTAUG	**Success:** **Rebooting...Do not turn OFF Power...** **Fail:** **ERROR**

 NOTE

- Do not turn OFF power during the process as this may cause module malfunction or bricking

22 GPIO Commands

22.1 AT+GPSET

Description

This command enables the user to set the GPIO 7 pin to HIGH (1.8V) or LOW(0V) states.

Syntax

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

Defined Values

Parameter	Explain
<n>	0 - Set to LOW 1 - Set to HIGH

23 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