CAVLI C31QM
LTE-M/NB-IoT Module
AT Command Manual

Version: 1.2

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Contents

Chapter 1. Introduction

1.1 Scope of the Document

This document presents the AT Commands Set for Cavli cellular engine C31-QM

1.2 AT Command Syntax

The "AT" or "at" prefix must be set at the beginning of each command line. To terminate a command line enter <CR>. Commands are usually followed by a response that includes "<CR><LF><response><CR><LF>". Throughout this document, only the responses are presented, "<CR><LF>" are omitted intentionally.

The AT Commands Set implemented by C31-QM is a combination of 3GPP TS 27.007, 3GPP TS 27.005 and ITU-T recommendation V.25ter as well as the AT Commands developed by YUGE.

All these AT commands can be split into three categories syntactically: "basic", "S parameter", and "extended". They are listed as follows:

- Basic syntax

These AT commands have the format of "AT<x><n>", or "AT&<x><n>", where "<x>" is the command, and "<n>" is/are the argument(s) for that command. An example of this is "ATE<n>", which tells the DCE whether received characters should be echoed back to the DTE according to the value of "<n>". "<n>" is optional and a default will be used if it is missing.

- S Parameter syntax

These AT commands have the format of "ATS<n>=<m>", where "<n>" is the index of the S register to set, and "<m>" is the value to assign to it.

- Extended syntax

These commands can be operated in several modes, as following table:

Table 1: Types of AT Commands and Responses

Command	Effect
AT+<x>=?	This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
AT+<x>?	This command returns the currently set value of the parameter or parameters.
AT+<x>=<…>	This command sets the user-definable parameter values.
AT+<x>	This command reads non-variable parameters affected by internal processes in the UE.

1.3 Supported Character Sets

C31-QM AT command interface defaults to the GSM character set. C31-QM module supports the following
character sets:

- GSM format
- UCS2
- IRA

The character set can be configured and interrogated by using the AT+CSCS command (3GPP TS 27.007) and it is defined in 3GPP TS 27.005. The character set affects transmission and reception of SMS and SMS Cell Broadcast Messages, as well as the entry and display of phone book entries text field.

1.4 AT Command Interface

C31-QM AT command interface includes two USB ports (USB MODEM port and USB AT port) and one main UART port. The main UART port and two USB ports support AT command communication and data transfer.

1.5 Unsolicited Result Code

As an Unsolicited Result Code and a report message, URC is not issued as part of the response related to an executed AT command. URC is issued by C31-QM without being requested by the TE and it is issued automatically when a certain event occurs. Typical events leading to URCs are incoming calls (RING), received short messages, high/low voltage alarm, high/low temperature alarm, etc.

Chapter 2. General Commands

2.1 ATI Display Product Identification Information

Description

The command requests the product information, which consists of manufacturer identification, model identification, revision identification, International Mobile station Equipment Identity (IMEI) and overall capabilities of the product.

Syntax

Command	Response
ATI	Manufacturer: <manufacturer> Model: <model> Revision: <revision> SVN:<Firmware version> IMEI: <imei> +GCAP: list of <name>s OK

Defined values

Parameter	values	Explain
<manufacturer>		The identification of manufacturer.
<model>		The identification of model.
<revision>		The revision identification of firmware.

<n>		
<sn>		Serial number identification, which consists of a single line containing IMEI (International Mobile station Equipment Identity) number.
<name>	+CGSM	GSM function is supported
	+FCLASS	FAX function is supported
	+DS	Data compression is supported
	+ES	Synchronous data mode is supported.

Examples

```
ATI

Manufacturer: Cavli Wireless

Model: C31-QM

Revision: C31-QM-V1 [Sep 06 2018 08:00:00]

SVN: 02

IMEI: 352745100001522

+GCAP: +CGSM


OK
```

2.2 AT+GMI Request Manufacturer Identification

Description

The command returns a manufacturer identification text. See also **AT+CGMI.**

Syntax

Command	Response
AT+GMI	<manufacturer> OK
AT+GMI=?	OK
AT+GMI=<manufacturer>	OK

Defined values

Parameter	values	Explain
<manufacturer>		The identification of manufacturer.

Examples

```
AT+GMI

Cavli Wireless


OK


AT+GMI=?

OK
```

2.3 AT+GMM Request TA Model Identification

Description

The command returns a product model identification text. It is identical with **AT+CGMM**.

Syntax

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

Defined values

Parameter	values	Explain
<name>		The identification of model.

Examples

```
AT+GMM

C31-QM


OK
```

AT+GMM=?

OK

2.4 AT+GMR Request TA Revision Identification of Software Release

Description

The command delivers a product firmware version identification text. It is identical with **AT+CGMR.**

Syntax

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

Defined values

Parameter	values	Explain
<software version>		The revision identification of firmware.

Examples

AT+GMR

C31-QM-V1 [Sep 06 2017 08:00:00]

OK

2.5 AT+CGMI Request Manufacturer Identification

Description

Execution command returns a manufacturer identification text.

Syntax

Command	Response
AT+CGMI	<manufacturer> OK
AT+CGMI=?	OK
AT+CGMI=<manufacturer>	OK

Defined values

Parameter	values	Explain
<manufacturer>		The identification of manufacturer.

Examples

```
AT+CGMI

Cavli Wireless


OK


AT+CGMI=?

OK
```

2.6 AT+CGMM Request Model Identification

Description

Execution command returns a product model identification text.

Syntax

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

Defined values

Parameter	values	Explain
<name>		The identification of model.

Examples

```
AT+CGMM

C31-QM


OK


AT+CGMM=?

OK
```

2.7 AT+CGMR Request Revision Identification

Description

Execution command delivers a product firmware version identification.

Syntax

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

Defined values

Parameter	values	Explain
<software version>		The revision identification of firmware.

Examples

```
AT+CGMR

C31-QM-V1 [Sep 06 2017 08:00:00]


OK
```

2.8 AT+GSN Request International Mobile Equipment Identity (IMEI)

Description

The command returns the International Mobile Equipment Identity (IMEI). It is identical with A**T+CGSN.**

Syntax

Command	Response
AT+GSN	<IMEI> OK
AT+GSN=?	OK

Defined values

Parameter	values	Explain
<IMEI>		Serial number identification

Examples

```
AT+GSN

352745100001522

OK
```

2.9 AT+CGSN Request Product Serial Number Identification

Description

Execution command returns International Mobile Equipment Identity (IMEI).

Syntax

Command	Response
AT+CGSN	<IMEI> OK
AT+CGSN=?	OK

Defined values

Parameter	values	Explain
<IMEI>		Serial number identification

Examples

```
AT+CGSN

352745100001522

OK
```

2.10 ATE Set Command Echo Mode

Description

The command controls if the module echoes characters received from TE during AT command state. Attention: dial-up network or the automatic processing software will automatically send the ATE0 to close the echoes.

Syntax

Command	Response
ATE[<value>]	OK

	or ERROR

Defined values

Parameter	values	Explain
<value>	0	Echo mode off
	1	Echo mode on

NOTE

The default value of <value> is 0

Examples

```
ATE

OK
```

2.11 A/ Repeat Previous Command Line

Description

The command repeats previous AT command line, and "/" acts as the line terminating character.

Syntax

Command	Response
A/	Return value of the last instruction

Examples

```
AT+CGMR

C31-QM-V1 [Sep 06 2017 08:00:00]
```

OK

A/

C31-QM-V1 [Sep 06 2017 08:00:00]

OK

2.12 AT+CFUN Set Phone Functionality

Description

The command controls the functionality level. It can also be used to reset the UE.

Syntax

Command	Response
AT+CFUN=[<fun>[,<rst>]]	OK
AT+CFUN?	+CFUN:<fun> OK
AT+CFUN=?	+CFUN:(<fun>list),(<rst>list) OK

Defined values

Parameter	values	Explain
<fun>	0	Minimum functionality

	1	Full functionality, online mode
	4	Disable phone both transmit and receive RF circuits
	5	Factory Test Mode
	6	Reset
	7	Offline Mode
<rst>	0	Do not reset the ME before setting it to <fun> power level
	1	Reset the ME before setting it to <fun> power level. This value only takes effect when <fun> equals 1.

Examples

```
AT+CFUN?

+CFUN: 1


OK


AT+CFUN=?

+CFUN: (0-1,4-7),(0-1)


OK


AT+CFUN=1,1


OK
```

2.13. AT+CPAS Mobile Equipment Activity Status

Description

Execution command returns the activity status <cpas> of the ME.

Syntax

Command	Response
AT+CPAS	+CPAS: <cpas> OK
AT+CPAS=?	+CPAS: (<cpas>list) OK

Defined values

Parameter	values	Explain
<cpas>	0	Ready (ME allows commands from TA/TE)
	3	Ringing
	4	Call in progress or call hold

Examples

```
AT+CPAS

+CPAS: 4


OK
```

```
AT+CPAS=?

+CPAS: (0,3,4)


OK
```

2.14 AT+CCLK Clock

Description

The command sets and queries the real time clock (RTC) of the module. The current setting is retained until the module is totally disconnected from power

Syntax

Command	Response
AT+CCLK=?	OK
AT+CCLK?	+CCLK: <time> OK

Defined value

Parameter	values	Explain
<time>		String type value. Format is "yy/MM/dd,hh:mm:ss±zz", indicating year (last two digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range: -48...+56). E.g. May 6th, 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

Example

```
AT+CCLK?

+CCLK: "80/01/06,04:55:01"

OK
```

2.15 AT+CMEE Error Message Format

Description

The command controls the format of error result codes: ERROR, error numbers or verbose messages as +CME ERROR: <err> and +CMS ERROR: <err> .

Syntax

Command	Response
AT+CMEE=<n>	OK
AT+CMEE?	+CMEE:<n> OK
AT+CMEE=?	+CMEE:(list of supported <n>s) OK

Defined values

Parameter	values	Explain
<value>	0~2	0:not use +CME ERROR:<err>result code, Error only returns ERROR
		1:use +CME ERROR:<err>result code,<err> Use error number values.
		2:use +CME ERROR:<err>result code,<err> Using the wrong detailed string value
<err>		Values are listed in Appendix CME ERROR list

Examples

```
AT+CMEE=2

OK
```

2.16 AT+CSCS Select TE Character Set

Description

The Write Command informs the module which character set is used by the TE. This enables the UE to convert character strings correctly between TE and UE character sets.

Syntax

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

	OK
AT+CSCS=<chset>	OK or ERROR
AT+CSCS	OK

Defined values

Parameter	values	Explain
<chset>	"IRA"	International reference alphabet.
	"GSM"	GSM default alphabet.
	"UCS2"	UCS2 alphabet

Examples

```
AT+CSCS=?

+CSCS: ("IRA","GSM","UCS2")


OK


AT+CSCS="IRA"

OK


AT+CSCS?

+CSCS: "IRA"
```

OK

Chapter 3. Serial Interface Control Commands

3.1 AT+IFC Set TE-TA Local Data Flow Control

Description

The command sets the flow control of the module.

Syntax

Command	Response
AT+IFC=<txfc>,<rxfc>	OK Or ERROR
AT+IFC?	+IFC: <txfc><rxfc> OK
AT+IFC=?	+IFC: (<txfc>list),(<rxfc>list) OK

Defined values

Parameter	values	Explain
<txfc>	0	none
	2	RTS/CTS
	3	XON/XOFF
<rxfc>	0	None
	2	RTS/CTS

NOTE

The default value is 0,0

Examples

```
AT+IFC?

+IFC: 0,0


OK


AT+IFC=?

+IFC: (0-3),(0-2)


OK


AT+IFC=2,2

OK
```

3.2 AT+ICF Set Control Character Framing

Description

The command sets character framing which contain data bit, stop bit and parity bit.

Syntax

Command	Response
AT+ICF=<format>,<parity>	OK

	Or ERROR
AT+ICF?	+ICF:<format>,<parity> OK
AT+ICF=?	+ICF:(<format>list),(<parity>list) OK

Defined values

Parameter	values	Explain
<format>	3	data bit 8, check bit 0 , stop bit 1
< parity >	0	odd
	1	even
	3	none

NOTE

The default value is 3,3

Examples

```
AT+ICF?

+ICF: 3,3


OK


AT+ICF=?
```

```
+ICF: (3),(0-3)

OK

AT+ICF=3,3
OK
```

3.3 AT+IPR Set Local Baud Rate Temporarily

Description

The command sets the baud rate of module's serial interface temporarily, after reboot the baud rate is set to default value. The default value is 115200.

Syntax

Command	Response
AT+IPR=<rate>	OK Or ERROR
AT+IPR?	+IPR: <rate> OK
AT+IPR=?	+IPR(<rate>list) OK

Defined values

Parameter	values	Explain
<rate>		300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,921600,2000000,2900000,3000000,3200000,3686400,4000000

NOTE

The default <rate> is 115200

Examples

AT+IPR?

+IPR: 115200

OK

AT+IPR=?

+IPR:(300,600,1200,2400,4800,9600,14400,19200,38400,57600,76800,115200,230400,460800,921600,1000000,1200000,1209677,1250000,1293103,1339286,1388889,1442308,1500000,1562500,1630435,1704545,1785714,2000000,2900000,3000000,3200000,3686400,4000000)

OK

AT+IPR=115200

OK

Chapter 4. (U)SIM Related Commands

4.1. AT+CIMI Request International Mobile Subscriber Identity (IMSI)

Description

Execution command requests the International Mobile Subscriber Identity (IMSI) which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) that is attached to MT.

Syntax

Command	Response
AT+CIMI	<IMSI> OK
AT+CIMI=?	OK

Defined values

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

Examples

```
AT+CIMI

460111176315796


OK
```

4.2 AT+CLCK Facility Lock

Description

The command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions.

Syntax

Command	Response
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	When <mode>=2 : +CLCK:<status>[,<class>] OK When <mode>≠2 : OK
AT+CLCK=?	+CLCK: (<fac>list) OK

Defined value

Parameter	values	Explain
<fac>	"AO"	Barr All Outgoing Calls
	"OI"	Barr Outgoing International Calls
	"OX"	Barr Outgoing International Calls except to Home Country
	"AI"	Barr All Incoming Calls
	"IR"	Barr Incoming Calls when roaming outside the home country

	"PN"	Network Personalization
	"PP"	Service Provider Personalization
	"PU"	Network subset Personalization
	"PC"	Corporate Personalization
	"PF"	Lock Phone to the very First inserted SIM card or USIM card
	"SC"	Lock SIM card or USIM card
	"FD"	SIM fixed dialing memory feature
<mode>	0	Unlock
	1	Lock
	2	Query status
<passwd>		Password.
<class>	1	Voice (telephony)
	2	Data (refers to all bearer services)
	4	Fax (facsimile services)
	8	Short message service
	16	Short message service
	32	Short message service
	64	Dedicated packet access
<status>	0	Not active
	1	Active

Example

```
AT+CLCK=?
```

```
+CLCK: ("AB","AC","AG","AI","AO","IR","OI","OX","SC","FD","PN","PU","PP","PC","PF")

OK

AT+CLCK="SC",2

+CLCK: 0

OK

AT+CLCK="SC",1,"1234"

OK

AT+CLCK="SC",2

+CLCK: 1

OK

AT+CLCK="SC",0,"1234"

OK

AT+CLCK="SC",2

+CLCK: 0

OK
```

4.3 AT+CPIN Enter PIN

Description

If the password request is PIN or PIN2 , please enter AT+CPIN=<PIN> to examine.

If the password request is PUK or PUK2 , please enter AT+CPIN=<PIN>,<newpin> to unlock the SIM card. The first parameter is SIM PUK or SIM PUK2 , the second parameter is new PIN or PIN2 .

Syntax

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

Defined value

Parameter	values	Explain
<pin>		Password (string type).
<newpin>		New password (string type)
<code>	READY	ME is not pending for any password
	SIM PIN	ME is waiting SIM PIN to be given
	SIM PUK	ME is waiting SIM PUK to be given
	SIM PIN2	ME is waiting SIM PIN2 to be given
	SIM PUK2	ME is waiting SIM PUK2 to be given

Example

```
AT+CPIN?

+CPIN: READY


OK
```

4.4 AT+CPWD Change Password

Description

Write command sets a new password for the facility lock function defined by command Facility Lock AT+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>	OK
AT+CPWD=?	+CPWD: (<fac>,<pwdlength>)list OK

Defined value

Parameter	values	Explain
<fac>	"AO"	Barr All Outgoing Calls
	"OI"	Barr Outgoing International Calls
	"OX"	Barr Outgoing International Calls except to Home Country

	"AI"	Barr All Incoming Calls
	"IR"	Barr Incoming Calls when roaming outside the home country
	"PN"	Network Personalization
	"PP"	Service Provider Personalization
	"PU"	Network subset Personalization
	"PC"	Corporate Personalization
	"PF"	Lock Phone to the very First inserted SIM card or USIM card
	"SC"	Lock SIM card or USIM card
	"FD"	SIM fixed dialing memory feature
<oldpwd>		String type, old password .
<newpwd>		String type, new password .
<pwdlength>		Integer type, max length of password

Example

```
AT+CPIN?

+CPIN: READY


OK


AT+CLCK="SC",1,"1234"        //Set the SIM card password as "1234"

OK


AT+CPWD="SC","1234","0000"    //Change SIM card password to "0000"
```

```
OK


AT+CFUN=1,1                 //Restart module

OK


AT+CPIN?

+CPIN: SIM PIN               //PIN code is locked


OK


AT+CPIN="1234"               //Enter the old password

+CME ERROR: incorrect password    //Password is incorrect


AT+CPIN="0000"               //Enter the new password

OK


AT+CPIN?                    //SIM card is ready

+CPIN: READY


OK
```

4.5 AT+CRSM Restricted SIM Access

Description

The command offers easy and limited access to the SIM database.

Syntax

Command	Response
AT+CRSM=<command>[,<fileID>[,<P1>,<P2>,<P3>[,<data>]]]	+CRSM:<sw1>,<sw2>[,<response>] OK
AT+CRSM=?	OK

Defined value

Parameter	values	Explain
<command>	176	READ BINARY
	178	READ RECORD
	192	GET RESPONSE
	214	UPDATE BINARY
	220	UPDATE RECORD
	242	STATUS
<fileID>		Identifier for an elementary data file on SIM, if used by <command>.
<P1>,<P2>,<P3>		Integer type; parameters transferred by the MT to the SIM.
<data>		Information which shall be written to the SIM
<sw1>,<sw2>		Status 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 data from SIM.

Example

```
AT+CRSM=242

+CRSM:
144,0,"622C820278218410A0000000871002FF86FF0389FFFFFFFF8A01058B032F0602C60C90
01608301018301818301 0A"


OK
```

4.6. AT+ICCID Show ICCID

Description

The command returns the ICCID (Integrated Circuit Card Identifier) number of the (U)SIM card.

Syntax

Command	Response
AT+ICCID	<iccid> OK
AT+ICCID=?	OK

Defined values

Parameter	values	Explain

<iccid>		Integrated Circuit Card Identifier (string, without double quotes).

Examples

```
AT+ICCID

89860317482035169142


OK
```

Chapter 5. Network Service Commands

5.1 AT+CREG Network Registration

Description

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

Syntax

Command	Response
AT+CREG=[<n>]	OK
AT+CREG?	+CREG: <n>,<stat> OK
AT+CREG=?	+CREG: (<n>list) OK

Defined value

Parameter	values	Explain
<n>	0-2	0 --- Disable network registration unsolicited result code 1 --- Enable network registration unsolicited result code +CREG: <stat> 2 --- Enable network registration unsolicited result code +CREG:<stat>[,<lac>,<ci>]

<stat>	0-5	0 --- Not registered, ME is not currently searching a new operator to register to 1 --- Registered, home network 2 --- Not registered, but ME is currently searching a new operator to register to 3 --- Registration denied 4 --- Unknown 5 --- Registered, roaming
<lac>		String type, two byte location area code in hexadecimal format
<ci>		String type, two byte cell ID in hexadecimal format

Example

```
AT+CREG?

+CREG: 0,3


OK
```

5.2 AT+COPS Operator Selection

Description

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

Read command returns the current mode and the currently selected operator.

Test command returns a list of quadruplets, each representing an operator present in the network.

Syntax

Command	Response
AT+COPS=<mode>[,<format>[,<oper>[,<Act>]]]	OK OR +CME ERROR: <err>
AT+COPS?	+COPS: <mode>[,<format>,<oper>,<Act>] OK
AT+COPS=?	+COPS:[(<stat>,long<oper>,short<oper>,numeric<oper>)s[,< Act>])s][,,(<mode>list),(<format>list)] OK

Defined value

Parameter	values	Explain
<stat>	0-3	--- Unknown --- Operator available --- Current operator ---Operator forbidden
<oper>		Operator in format as per <mode>
<mode>	0-4	0 --- Automatic mode; <oper> field is ignored 1 --- Manual operator selection. <oper> field must be present. --- Manual deregister from network 3 --- Set only <format>

		4 --- Manual/automatic
<format>	0-2	0 ---Long format alphanumeric <oper> 1 --- Short format alphanumeric <oper> 2 --- Numeric <oper>
<Act>	0,8,9	0 --- GSM 8 --- LTE Cat.M1 9 --- LTE Cat.NB1

Example

```
AT+COPS?

+COPS: 0,0,"460 11 ????",9


OK
```

5.3 AT+CSQ Signal Quality Report

Description

Execution command returns received signal strength indication <rssi> and channel bit error rate <ber> from the ME. Test command returns values supported by the TA as compound values.

Syntax

Command	Response
AT+CSQ	+CSQ:<rssi>,<ber> OK

AT+CSQ=?	+CSQ:(<rssi>list),(<ber>list) OK

Defined values

Parameter	values	Explain
<rssi>	0	- 113 dBm or less
	1	- 111 dBm
	2-30	- 109... - 53 dBm
	31	-51 dBm
	99	not known or not detectable
	100	-116dBm or less
	101	-115dBm
	102...190	-114...-26dBm
	191	-25dBm or greater
	199	Not known or not detectable
<ber>	0	<0.01%
	1	0.01% --- 0.1%
	2	0.1% --- 0.5%
	3	0.5% --- 1.0%
	4	1.0% --- 2.0%
	5	2.0% --- 4.0%
	6	4.0% --- 8.0%

	7	>=8.0%
	99	not known or not detectable

Examples

```
AT+CSQ

+CSQ: 19,99


OK


AT+CSQ=?

+CSQ: (0-31,99),(0-7,99)


OK
```

5.4 AT+CPOL Preferred Operator List

Description

The command is used to edit the SIM preferred list of networks.

Execute command writes an entry. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed.

Syntax

Command	Response
AT+CPOL=[<index>][,<format>[,<oper>]]	OK

AT+CPOL?	+CPOL:<index>,<format>,<oper> [...] OK
AT+CPOL=?	+CPOL: (<index>list),(<format>list) OK

Defined value

Parameter	values	Explain
<index>	1-8	Integer type, the order number of operator in the SIM preferred operator list.
<format>	0-2	0 --- Long format alphanumeric <oper> 1 --- Short format alphanumeric <oper> 2 --- Numeric <oper>
<oper>		String type; <format> indicates if the format is alphanumeric or numeric.

Example

```
AT+CPOL?

OK
```

5.5 AT+CPSMS Power Saving Mode Setting

Description

The Command controls the setting of the UE‟s power saving mode (PSM) parameters.

Syntax

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

Defined value

Parameter	values	Explain
<mode>	0 - 1	0 --- Disable the use of PSM 1 --- Enable the use of PSM
<Requested_Periodic-RAU>		String type. One byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN. (e.g. "01000111" equals to 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
<Requested_GPRS-READY-timer>		String type. One byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN. (e.g. "01001010" equals to 1 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 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.
<Requested_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. "00001010" equals to 100 minutes) 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
<Requested_Active-Time>		String type. One byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. (e.g. "00001111" equals to 1 minute) 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 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

Example

```
AT+CPSMS=1,,,"00000100","00001111"
```

OK

5.6 AT+CEDRXS e-I-DRX Setting

Description

The Command controls the setting of the UE‟s e-I-DRX (extended idle mode DRX) parameters.

Syntax

Command	Response
AT+CEDRXS=?	+CEDRXS: (list of supported <mode>s),(list of supported <AcT-type>s),(list of supported<Requested eDRX_value>s) OK
AT+CEDRXS=[<mode>,[,<AcT-type>[,<Requested_eDRX_value>]]]	OK
AT+CEDRXS?	[+CEDRXS: <AcT-type>,<Requested_eDRX_value> [+CEDRXS: <AcT-type>,<Requested_eDRX_value> [...]]] OK

Defined value

Parameter	values	Explain
<mode>	0 - 3	Integer type. Disable or enable the use of e-I-DRX in the UE.

		0 --- Disable the use of e-I-DRX 1 --- Enable the use of e-I-DRX 2 --- Enable the use of e-I-DRX and enable the unsolicited result code +CEDRXP:<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] 3 --- Disable the use of e-I-DRX and discard all parameters for e-I-DRX or, if available, reset to the manufacturer specific default values
<AcT-type>	0 - 5	Integer type. The type of access technology. 0 --- Access technology is not using e-I-DRX. This parameter value is only used in the unsolicited result code. 1 --- LTE Cat.M1 2 --- GSM 3 --- UTRAN 4 --- LTE 5 --- LTE Cat.NB1
<Requested_eDRX_value>		String type. Half a byte in a 4 bit format. bit 4 3 2 1 E-UTRAN e-I-DRX cycle length duration 0 0 0 0 5.12 seconds 0 0 0 1 10.24 seconds

		0 0 1 0 20.48 seconds 0 0 1 1 40.96 seconds 0 1 0 0 61.44 seconds 0 1 0 1 81.92 seconds 0 1 1 0 102.4 seconds 0 1 1 1 122.88 seconds 1 0 0 0 143.36 seconds 1 0 0 1 163.84 seconds 1 0 1 0 327.68 seconds 1 0 1 1 655,36 seconds 1 1 0 0 1310.72 seconds 1 1 0 1 2621.44 seconds 1 1 1 0 5242.88 seconds 1 1 1 1 10485.76 seconds

Example

```
AT+CEDRXS=1,5,"0000"


OK
```

5.7 AT+CEDRXRDP Read Dynamic Parameters

Description

The Execution Command returns <AcT-type>, <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if e-I-DRX is used for the cell that the MS is currently registered to.

Syntax

Command	Response
AT+CEDRXRDP=?	OK
AT+CEDRXRDP	+CEDRXRDP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] OK

Defined value

Parameter	values	Explain
<AcT-type>	0 – 5	Integer type. The type of access technology. 0 --- Access technology is not using e-I-DRX. This parameter value is only used in the unsolicited result code. 1 --- LTE Cat.M1 2 --- GSM 3 --- UTRAN 4 --- LTE 5 --- LTE Cat.NB1
<Requested_eDRX_value>		String type. Half a byte in a 4 bit format. bit 4 3 2 1 E-UTRAN e-I-DRX cycle length duration 0 0 0 0 5.12 seconds 0 0 0 1 10.24 seconds

		0 0 1 0 20.48 seconds 0 0 1 1 40.96 seconds 0 1 0 0 61.44 seconds 0 1 0 1 81.92 seconds 0 1 1 0 102.4 seconds 0 1 1 1 122.88 seconds 1 0 0 0 143.36 seconds 1 0 0 1 163.84 seconds 1 0 1 0 327.68 seconds 1 0 1 1 655,36 seconds 1 1 0 0 1310.72 seconds 1 1 0 1 2621.44 seconds 1 1 1 0 5242.88 seconds 1 1 1 1 10485.76 seconds
<NW-provided_eDRX_value>		String type. Half a byte in a 4 bit format. bit 4 3 2 1 E-UTRAN e-I-DRX cycle length duration 0 0 0 0 5.12 seconds 0 0 0 1 10.24 seconds 0 0 1 0 20.48 seconds 0 0 1 1 40.96 seconds 0 1 0 0 61.44 seconds

		0 1 0 1 81.92 seconds 0 1 1 0 102.4 seconds 0 1 1 1 122.88 seconds 1 0 0 0 143.36 seconds 1 0 0 1 163.84 seconds 1 0 1 0 327.68 seconds 1 0 1 1 655,36 seconds 1 1 0 0 1310.72 seconds 1 1 0 1 2621.44 seconds 1 1 1 0 5242.88 seconds 1 1 1 1 10485.76 seconds
<Paging_time_window>		String type. Half a byte in a 4 bit format. LTE Cat.M1 mode bit 4 3 2 1 Paging Time Window length 0 0 0 0 1.28 seconds 0 0 0 1 2.56 seconds 0 0 1 0 3.84 seconds 0 0 1 1 5.12 seconds 0 1 0 0 6.4 seconds 0 1 0 1 7.68 seconds 0 1 1 0 8.96 seconds

		0 1 1 1 10.24 seconds 1 0 0 0 11.52 seconds 1 0 0 1 12.8 seconds 1 0 1 0 14.08 seconds 1 0 1 1 15.36 seconds 1 1 0 0 16.64 seconds 1 1 0 1 17.92 seconds 1 1 1 0 19.20 seconds 1 1 1 1 20.48 seconds LTE Cat.NB1 mode bit 4 3 2 1 Paging Time Window length 0 0 0 0 2.56 seconds 0 0 0 1 5.12 seconds 0 0 1 0 7.68 seconds 0 0 1 1 10.24 seconds 0 1 0 0 12.8 seconds 0 1 0 1 15.36 seconds 0 1 1 0 17.92 seconds 0 1 1 1 20.48 seconds 1 0 0 0 23.04 seconds 1 0 0 1 25.6 seconds

		1 0 1 0 28.16 seconds 1 0 1 1 30.72 seconds 1 1 0 0 33.28 seconds 1 1 0 1 35.84 seconds 1 1 1 0 38.4 seconds 1 1 1 1 40.96 seconds

5.8 AT^SYSINFO Query System Information

Description

The Execution Command returns UE system information.

Syntax

Command	Response
AT^SYSINFO	^SYSINFO: <srv_status>,<srv_domain>,<roam_status>,<sys_mode>,<sim_state> OK

Defined value

Parameter	values	Explain
<srv_status>	0 - 4	0 --- No service 1 --- Limited service 2 --- Service available 3 --- Limited regional service 4 --- power save or deep sleep

<srv_domain>	0 - 4	0 --- No service 1 --- CS only capable 2 --- PS only capable 3 --- CS and PS capable 4 --- Searching network
<roam_status>	0 - 1	0 --- Roaming off 1 --- Roaming on
<sys_mode>		0 --- No service 3 --- GSM mode 9 --- LTE mode 12 --- Cat-M mode 13 --- Cat-NB mode
<sim_state>	0 - 1	0 --- SIM is not available 1 --- SIM is available

Example

```
AT^SYSINFO

^SYSINFO: 2,2,0,13,1


OK
```

5.9 AT^MODECONFIG Select Prefer Mode

Description

The Command controls UE prefer mode

Syntax

Command	Response
AT^MODECONFIG=<mode>	OK
AT^MODECONFIG?	^MODECONFIG: <mode> OK
AT^MODECONFIG=?	^MODECONFIG: (<mode>list) OK

Defined value

Parameter	values	Explain
<mode>		2 --- Automatic 13 --- GSM only 38 --- LTE only 51 --- GSM and LTE

Example

```
AT^MODECONFIG=38

OK


AT^MODECONFIG?

^MODECONFIG: 38


OK
```

5.10 AT+CPING Ping destination address

Description

This command is used to ping destination address.

Syntax

Command	Response
AT+CPING=?	+CPING:IP address, (list of supported <dest_addr_type>s), (1-100), (4-188), (1000-10000),(10000-100000), (16-255) OK
AT+CPING=<dest_addr>,<dest_addr_type>[,<num_pings>[,<data_packet_size>[,<interval_time>[,<wait_time>[,<TTL>]]]]]	OK +CPING:<result_type>,<resolved_ip_addr>,<data_packet_size>,<rtt>,<TTL> +CPING:<result_type>,<num_pkts_sent>,<num_pkts_recvd>,<num_pkts_lost>,<min_rtt>,<max_rtt>,<avg_rtt>

Defined value

Parameter	values	Explain
<dest_addr>		The destination is to be pinged; it can be an IP address or a domain name.
<dest_addr_type>	1-2	Integer type. Address family type of the destination address 1---IPv4 2---IPv6(reserved)

<num_pings>	1-100	Integer type. The num_pings specifies the number of times the ping request (1-100) is to be sent.The default value is 4.
<data_packet_size>	4-188	Integer type. The default value is 64 bytes.
<interval_time>	1000-10000	Interval between each ping. The default value is 2000ms
<wait_time>	10000-100000	Wait time for ping response. An ping response received after the timeout shall not be processed. The default value is 10000ms.
<TTL>	16-255	Integer type. TTL(Time-To-Live) value for the IP packet over which the ping(ICMP ECHO Request message) is sent (16-255), the default value is 255.
<result_type>	1-3	1 – Ping success 2 – Ping time out 3 – Ping result
<num_pkts_sent>		Indicates the number of ping requests that were sent out.
<num_pkts_recvd>		Indicates the number of ping responses that were received.
<num_pkts_lost>		Indicates the number of ping responses that were received.
<min_rtt>		Indicates the minimum Round Trip Time(RTT).

<max_rtt>		Indicates the maximum RTT.
<avg_rtt>		Indicates the average RTT.
<resolved_ip_addr>		Indicates the resolved ip address.
<rtt>		Round Trip Time.

Example

```
AT+CPING=?

+CPING: IP address,(1,2),(1-100),(4-188),(1000-10000),(10000-100000),(16-255)


OK

AT+CPING="8.8.8.8",1,4,64,1000,10000,255

OK


+CPING: 1,8.8.8.8,64,479,255


+CPING: 1, 8.8.8.8,64,420,255


+CPING: 1, 8.8.8.8,64,380,255


+CPING: 1, 8.8.8.8,64,340,255


+CPING: 3,4,4,0,340,479,404
```

Chapter 6.Packet Domain Commands

6.1 AT+CGATT Attachment or Detachment of PS

Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

Syntax

Command	Response
AT+CGATT=[<state>]	OK
AT+CGATT?	+CGATT: <state> OK
AT+CGATT=?	+CGATT: (<state>list) OK

Defined value

Parameter	values	Explain
<state>	0-1	Indicates the state of Packet Domain attachment: 0 --- detached 1 --- attached

Example

```
AT+CGATT?
```

```
+CGATT: 1

OK

AT+CGATT=0

OK
```

6.2 AT+CGDCONT Define PDP Context

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the write command (AT+CGDCONT=<cid>) causes the values for context <cid> to become undefined.

Syntax

Command	Response
AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]]	OK
AT+CGDCONT?	+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp> [+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>] OK

AT+CGDCONT=?	+CGDCONT:(supported<cid>s),<PDP_type>,,,(<d_comp>list),(<h_comp>list) OK

Defined value

Parameter	values	Explain
<cid>	1-24,100-179	(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition.
<PDP_type>	"IP","PPP","IPV6","IPV4V6"	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.
<APN>		(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
<PDP_addr>		A string parameter that identifies the MT in the address space applicable to the PDP.
<d_comp>	0-2	A numeric parameter that controls PDP data compression: 0 --- off (default if value is omitted) 1 --- on 2 --- V.42bis
<h_comp>	0-4	A numeric parameter that controls PDP header compression: 0 --- off (default if value is omitted) 1 --- on

		2 --- RFC1144 3 --- RFC2507 4 --- RFC3095

Example

```
AT+CGDCONT?

+CGDCONT: 1,"IPV4V6","","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0


OK


AT+CGDCONT=1,"IP","3GNET"

OK
```

6.3 AT+CGACT PDP Context Activate or Deactivate

Description

The write command is used to activate or deactivate the specified PDP context (s). If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts.

Syntax

Command	Response
AT+CGACT=<state>[,<cid>[,<cid>[,...]]]	OK
AT+CGACT?	+CGACT: <cid>,<state> [+CGACT: <cid>,<state>[...]]

	OK
AT+CGACT=?	+CGACT: (<state>list) OK

Defined value

Parameter	values	Explain
<state>	0-1	Indicates the state of PDP context activation 0 --- Deactivated 1 --- Activated
<cid>	1-24,100-179	A numeric parameter which specifies a particular PDP context definition

Example

```
AT+CGACT?

+CGACT: 1,1


OK
```

6.4 AT+CGPADDR Show PDP Address

Description

The Write 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.

Syntax

Command	Response
AT+CGPADDR	+CGPADDR: <cid>,<PDP_addr> OK

Defined value

Parameter	values	Explain
<cid>		A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command)
<PDP_addr>		A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the AT+CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available .

Example

```
AT+CGPADDR

+CGPADDR: 1,10.37.207.17


OK
```

6.5 AT+CGREG GPRS Network Registration Status

Description

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

Syntax

Command	Response
AT+CGREG=[<n>]	OK
AT+CGREG?	+CGREG: <n>,<stat> OK
AT+CGREG=?	+CGREG: (<n>list) OK

Defined value

Parameter	values	Explain
<n>	0-2	0 --- Disable network registration unsolicited result code 1 --- Enable network registration unsolicited result code +CGREG: <stat> 2 --- Enable network registration unsolicited result code +CGREG:<stat>[,<lac>,<ci>]
<stat>	0-5	0 --- Not registered, ME is not currently searching a new operator to register to 1 --- Registered, home network 2 --- Not registered, but ME is currently searching a new operator to register to

		3 --- Registration denied 4 --- Unknown 5 --- Registered, roaming
<lac>		String type, two byte location area code in hexadecimal format
<ci>		String type, two byte cell ID in hexadecimal format

Example

```
AT+CGREG?

+CGREG: 0,1


OK
```

6.6 AT+CGSMS Select Service for MO SMS Messages

Description

The command specifies the service or service preference that the MT will use to send MO (mobile originated) SMS messages.

Syntax

Command	Response
AT+CGSMS =[<**service**>]	OK
AT+CGSMS?	+CGSMS: <**service**> OK
AT+CGSMS =?	+CGSMS: (<**service**>list)

	OK

Defined value

Parameter	values	Explain
<service>	0-3	A numeric parameter which indicates the service or service preference to be used 0 --- GPRS 1 --- Circuit switch 2 --- GPRS preferred (use circuit switched if GPRS is not available) 3---Circuit switch preferred (use GPRS if circuit switched is not available)

NOTE

The circuit switched service route is the default method.

6.7 AT+CEREG EPS Network Registration Status

Description

The command queries the network registration status and controls the presentation of:

- **the unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT‟s EPS network registration status in E-UTRAN.**
- **the unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<Act>]] when <n>=2 and there is a change of the network cell in E-UTRAN, and**
- **the unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]] when <n>=4 and there is a change of the network cell in E-UTRAN.**

Syntax

Command	Response
AT+CEREG=[<n>]	OK
AT+CEREG?	+CEREG: <n>,<stat> OK
AT+CEREG=?	+CEREG: (<n>list) OK

Defined value

Parameter	values	Explain
<n>	0-2	0 --- Disable network registration unsolicited result code 1 --- Enable network registration unsolicited result code +CEREG: <stat> 2 --- Enable network registration unsolicited result code +CEREG:<stat>[,<lac>,<ci>]
<stat>	0-5	0 --- Not registered, ME is not currently searching a new operator to register to 1 --- Registered, home network 2 --- Not registered, but ME is currently searching a new operator to register to 3 --- Registration denied 4 --- Unknown 5 --- Registered, roaming

<lac>		String type, two byte location area code in hexadecimal format
<ci>		String type, two byte cell ID in hexadecimal format

Example

```
AT+CEREG?

+CEREG: 0,1


OK
```

Chapter 7. TCP/IP Related Commands

7.1 AT+IPNETOPEN Open socket network

Description

This command opens packet network.

Syntax

Command	Response
AT+IPNETOPEN	OK +IPNETOPEN: <err>
	+IP ERROR: <err_info> ERROR
AT+IPNETOPEN?	+IPNETOPEN: <net_state> OK

Defined value

Parameter	values	Explain
<err>	0	The result of operation, 0 is success, other value is failure
<net_state>	0-1	A numeric parameter that indicates the state of PDP context activation 0 --- Network close (deactivated) 1 --- Network open(activated)
<err_info>		A string parameter that displays the cause of occurring error

Example

```
AT+IPNETOPEN

OK


+IPNETOPEN: 0


AT+IPNETOPEN

+IP ERROR: 4


ERROR


AT+IPNETOPEN?

+IPNETOPEN: 1


OK
```

7.2 AT+IPOPEN Establish socket connection in multi-socket mode

Description

This command is used to establish a connection with TCP server and UDP server, The sum of all of connections is 10。

Syntax

Command	Response
AT+IPOPEN=<link_num>,"TCP","<serverIP>",<serverPort>[,<localPort>]	OK +IPOPEN: <link_num>,<err>
	+IPOPEN: <link_num>,<err> ERROR
AT+IPOPEN=<link_num>,"UDP",,,<localPort>	+IPOPEN: <link_num>,<err> OK
	+IPOPEN: <link_num>,<err> ERROR
AT+IPOPEN?	+IPOPEN: <link_num>,"<type>","<serverIP>",<serverPort>,<index> +IPOPEN: <link_num>,"<type>","<serverIP>",<serverPort>,<index> ..... OK
AT+IPOPEN=?	+IPOPEN: (list of supported <link_num>), (list of supported <type>) OK

Defined value

Parameter	values	Explain
<link_num>	0-9	A numeric parameter that identifies a connection,this parameter is used for multi clients.
<type>	TCP/UDP	a string parameter that identifies the type of transmission protocol. TCP --- Transfer Control Protocol UDP --- User Datagram Protocol If AT+CIPMODE=1 is set, the <type> is restricted to be only "TCP".
<serverIP>		A string parameter that identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point : "AAA.BBB.CCC.DDD".
<serverPort>	0-65535	a numeric parameter that identifies the port of TCP server
<localPort>	0-65535	a numeric parameter that identifies the port of local socket
<index>	-1、0-3	a numeric parameter that identifies the server index that the client linked when as a TCP server. -1---Not as a TCP server 0-3---TCP server index

Example

```
AT+IPOPEN=0,"TCP","8.8.8.8",1234

OK


+IPOPEN: 0,0


AT+IPOPEN=1,"TCP","8.8.8.8",1234

OK
```

```
+IPOPEN: 1,0

.....


AT+IPOPEN=9,"TCP","8.8.8.8",1234

OK


+IPOPEN: 9,0


AT+IPOPEN?

+IPOPEN: 0,"TCP","8.8.8.8",1234,-1

+IPOPEN: 1,"TCP","8.8.8.8",1234,-1

+IPOPEN: 2,"TCP","8.8.8.8",1234,-1

+IPOPEN: 3,"TCP","8.8.8.8",1234,-1

+IPOPEN: 4,"TCP","8.8.8.8",1234,-1

+IPOPEN: 5,"TCP","8.8.8.8",1234,-1

+IPOPEN: 6,"TCP","8.8.8.8",1234,-1

+IPOPEN: 7,"TCP","8.8.8.8",1234,-1

+IPOPEN: 8,"TCP","8.8.8.8",1234,-1

+IPOPEN: 9,"TCP","8.8.8.8",1234,-1


OK
```

7.4 AT+IPSEND Send data through TCP or UDP connection

Description

This command is used to send data to remote side. The <length> field can be empty, when it is empty, Each <Ctrl+Z> character present in the data should be coded as <ETX><Ctrl+Z>. Each <ESC> character present in the data should be coded as <ETX><ESC>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the input data. Single <ESC> is used to cancel the sending.
<ETX> is 0x03, and <Ctrl+Z> is 0x1A, <ESC> is 0x1B

Syntax

Command	Response
TCP AT+IPSEND=<link_num>,<length>	OK +IPSEND: <link_num>,<reqSendLength>,<cnfSendLength>
UDP AT+IPSEND=<link_num>,<length>,"<serverIP>",<serverPort>	OK +IPSEND: <link_num>,<reqSendLength>,<cnfSendLength>
AT+IPSEND?	OK
AT+IPSEND=?	+IPSEND: (list of supported <link_num>), (list of supported <length>) OK

Defined value

Parameter	values	Explain
<link_num>	0-9	A numeric parameter that identifies a connection,this parameter is used for multi clients.
<length>	1-1500	a numeric parameter which indicates the length of sending data, it must be between1 and 1500.
<serverIP>		A string parameter that identifies the IP address of server.The IP address format consists of 4 octets,separated by decimal point : "AAA.BBB.CCC.DDD".
<serverPort>		a numeric parameter that identifies the port of TCP server
<reqSendLength>		a numeric parameter that requested number of data bytes to be transmitted.
<cnfSendLength>		a numeric parameter that confirmed number of data bytes to be transmitted. -1 the connection is disconnected. 0 own send buffer or other side's congestion window are full. Note: If the <cnfSendLength> is not equal to the <reqSendLength>, the socket then cannot be used further

Example

```
AT+IPOPEN=0,"TCP","8.8.8.8",1234

OK


+IPOPEN: 0,0


AT+IPOPEN=1,"UDP",,,1001

+IPOPEN: 1,0
```

```
OK


AT+IPSEND=0,10

>##########

OK


+IPSEND: 0,10,10


AT+IPSEND=1,10," 8.8.8.8",1234

>&&&&&&&&&&

OK


+IPSEND: 1,10,10
```

7.5 AT+IPCLOSE Close TCP or UDP socket

Description

This command is used to close TCP or UDP socket。

Syntax

Command	Response
TCP AT+IPCLOSE=<link_num>	OK +IPOPEN: <link_num>,<err>
	+IPCLOSE: <link_num>,<err>

	ERROR
UDP AT+IPCLOSE=<link_num>	+IPOPEN: <link_num>,<err> OK
	+IPOPEN: <link_num>,<err> ERROR
AT+IPCLOSE?	+IPCLOSE: <link0_state>,<link1_state>,<link2_state>,<link3_state>,<link4_state>,<link5_state>,<link6_state>,<link7_state>,<link8_state>,<link9_state> OK
AT+IPCLOSE=?	+IPCLOSE: (list of supported <link_num>s) OK

Defined value

Parameter	values	Explain
<link_num>	0-9	A numeric parameter that identifies a connection,this parameter is used for multi clients.
<err>		The result of operation, 0 is success, other value is failure
<linkn_state>	0-1	a numeric parameter that identifies state of <link_num>. the range of permitted values is 0 to 1. 0 disconnected 1 connected

Example

```
AT+IPCLOSE?

+IPCLOSE: 0,0,0,0,0,0,0,1,1,1


OK


AT+IPCLOSE=7

OK


+IPCLOSE: 7,0


AT+IPCLOSE=8

OK


+IPCLOSE: 8,0


AT+IPCLOSE=9

OK


+IPCLOSE: 9,0


AT+IPCLOSE?

+IPCLOSE: 0,0,0,0,0,0,0,0,0,0


OK
```

```
AT+IPCLOSE=?

+IPCLOSE: (0-9)


OK
```

7.6 AT+IPNETCLOSE Close socket network

Description

This command closes network. Before calling this command, all opened sockets must be closed first.

Syntax

Command	Response
AT+IPNETCLOSE	OK +IPNETCLOSE: <err>
	+IPNETCLOSE: <err> ERROR
AT+IPNETCLOSE=?	OK

Defined value

Parameter	values	Explain
<err>		The result of operation, 0 is success, other value is failure

Example

```
AT+IPNETCLOSE

OK


+IPNETCLOSE: 0


AT+IPNETCLOSE


+IPNETCLOSE: 2


ERROR


AT+IPNETCLOSE=?

OK
```

Chapter 8. GPS Related Commands

8.1 AT+CGPS Start/Stop GPS session

Description

This command is used to start or stop GPS session.

Syntax

Command	Response
AT+CGPS=<ctrl>	OK
AT+CGPS?	+CGPS: <ctrl>,<mode> OK
AT+CGPS=?	+CGPS: (0-2),(1-3) OK

Defined value

Parameter	values	Explain
<ctrl>	0-2	0: Stop GPS session 1: Start one-shot GPS session 2: Start tracking mode GPS session
<mode>	1-3	1: standalone mode 2: ms-based 3: ms-assisted

Example

```
AT+CGPS=2

OK


AT+CGPS=0

OK
```

8.2 AT+CGPSCOLD Set GPS cold start

Description

This command is used to set GPS cold start, It's mean delete ALL assistance data.

Syntax

Command	Response
AT+CGPSCOLD	OK

Example

```
AT+CGPSCOLD

OK


AT+CGPS=1

OK
```

8.3 AT+CGPSWARM Set GPS warm start

Description

This command is used to set GPS warm start, which will delete GPS ephemeris data.

Syntax

Command	Response
AT+CGPSWARM	OK

Example

```
AT+CGPSWARM

OK


AT+CGPS=1

OK
```

8.4 AT+CGPSNMEA Configure NMEA sentence type

Description

This command is used to configure NMEA output sentences which are generated by the gps engine when position data is available.

Syntax

Command	Response
AT+CGPSNMEA=<nmea>	OK

AT+CGPSNMEA?	+CGPSNMEA: <nmea> OK
AT+CGPSNMEA=?	+CGPSNMEA: (0-511) OK

Defined value

Parameter	values	Explain
<nmea>	0-511	Each bit enables an NMEA sentence output as follows: Bit 0: GPGGA (global positioning system fix data) 1: GPRMC (recommended minimum specific GPS data) 2: GPGSV (GPS satellites in view) 3: GPGSA (GPS DOP and active satellites) 4: GPVTG (track made good and ground speed) 5: PQXFI (Global Positioning System Extended Fix Data) 6: GNGNS 7: GNGSA (GPS and GLONASS satellites) 8: GLGSV(GLONASS satellites in view)

Example

```
AT+CGPSNEMA=2    //output GPRMC only

OK
```

8.5 AT+CGPSPORT Configure output port for NMEA sentence

Description

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

Syntax

Command	Response
AT+CGPSPORT=<port>	OK
AT+CGPSPORT?	+CGPSPORT: <port> OK
AT+CGPSPORT=?	+CGPSPORT: (0-3) OK

Defined value

Parameter	values	Explain
<port>	0-3	0: Temporary does not support 1: Modem port 2: AT port 3: UART port

Example

```
AT+CGPSPORT=3

OK
```

8.6 AT+CGPSHOR Configure GPS accuracy threshold

Description

This command is used to configure GPS position accuracy threshold

Syntax

Command	Response
AT+CGPSHOR=<thre>	OK
AT+CGPSHOR?	+CGPSHOR: <thre> OK
AT+CGPSHOR=?	+CGPSHOR: (0- 1800000) OK

Defined value

Parameter	values	Explain
< thre >	0-1800000	GPS accuracy threshold in meters

Example

```
AT+CGPSHOR=10

OK
```