

PS02515

LTE Series Modules AT Command Specification

V0.1

Document information

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Abstract	This document defines AT command format used by RisingHF LTE module

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Chapter 1. Summary

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

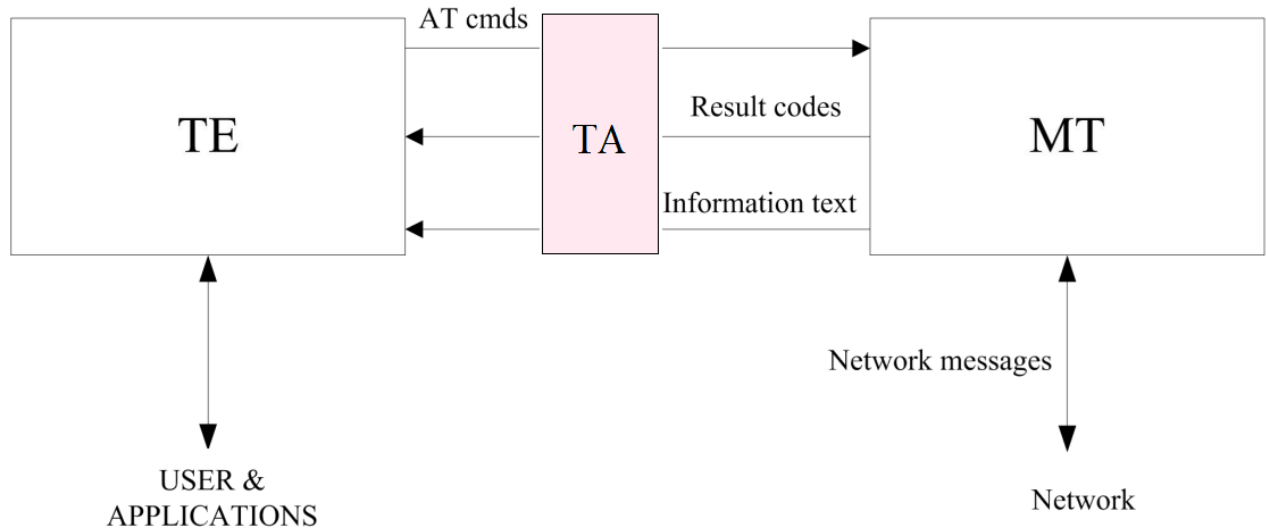


Figure 1-1 AT command interface

1.1 AT Command Syntax

1. Optional parameter 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 .
2. 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.
3. Optional parameters or the optional part of the results return from TA should be in the square brackets.
4. When you don’t use double quotes, the spaces between the characters in the string are negligible.
5. In actual use, do not need to enter < >, [].
6. All AT commands are not case sensitive, “AT” or “at” is OK.

1.2 AT Command Interface

Each interface requires functional cohesion.

Because of the AT command transmit the data packets through communication port, so the size of the package is limited . For sending AT commands, in addition to the characters “AT”, MT can receiving 1600 characters in length at most, including the null character at the end of the commands. MT active reported response messages or URC (Unsolicited Result Code), the maximum length is also 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 end with a carriage return, and response and reporting end with 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 want to execute a second AT command, it must first wait for the response of the last AT command from MT. Otherwise the second AT command will not be executed.

To ensure that other tasks are not interrupted, it is suggested that report response results work in asynchronous mode for the AT command which need long time to response. If MT takes a long time to respond to the TE, there is possibility the response is interrupted by a URC. This interruption contains two cases: one is that the URC report occurs during the response process of an executed AT command, the AT command response result will be reported after the end of URC report. Another is that the URC report occurs during or before the AT command executing, the AT command response will be reported together with the URC report lead to two kinds of reports mixed. Some special URC such as RING will be treated 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, but combination of quotes and comma is not allowed. AT command string can't support the combination of comma and quotes.

The current version AT command does not support the escape character. For the UCS2 encoding format data, the encoding data will 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. The response format can be controlled by ATV command.

1.3 AT Command Interface Standards

1. The standard of add new interface

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

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

If the AT command from MT con not recognize the current interface, the report message of command not support will be reported. If the parameters exceed the range of the anticipated parameters, there will be two ways to process, one is to report message of too many parameters, and the other way is fault-tolerant processing which will not judge the extra parameter.

Chapter 2. Terms and Abbreviations

Abbreviations	Full name
TE	Terminal Equipment, the device that initiates the command
TA	Terminal Adapter, Modem that executes instructions
MT	Mobile Terminal, Mobile network device terminal
AAA	Authentication Authorization Accounting
WCDMA	Wide band Code Division Multiple Access
ESN	Electronic Serial Number
FTP	File Transfer Protocol
GIS	Geographic Information System
GPS	Global Positioning System
IMSI	International Mobile Subscriber Identity
IMEI	International Mobile Equipment Identity
MDN	Mobile Directory Number
PDSN	Packet Data Serving Node
PPP	Point to Point Protocol
SGIP	Short Message Gateway Interface Protocol
SI	System Integrate
SMG	Short Message Gateway
SMPP	Short Message Peer to Peer
TCP	Transmission Control Protocol
UDP	User Data gram Protocol
SIM	Subscriber Identity Module
EDGE	Enhanced Data GSM Environment
EGPRS	Enhanced General Packet Radio Service
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
PDU	Protocol Data Unit

Chapter 3. General Commands

3.1 AT command

Description

Can be used to check if the module AT is available.

Syntax

Command	Response
AT	OK
Maximum Response Time	300ms

Example

```
AT
OK
```

3.2 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
Maximum Response Time	300ms

Defined values

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

NOTE:

✧ The default value of <value> is 1.

Example

ATE1

OK

3.3 ATV Set Result Code Format Mode

Description

This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses.

In case of using the command without parameter <value> will be set to 1.

Syntax

Command	Response
ATV[<value>]	0 If<value>=0 or OK If<value>=1
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<value>	0	Information response: <text><CR><LF> Short result code format: <numeric code><CR>
	1	Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code><CR><LF>

Example

ATV

0

ATV1

OK

3.4 ATI Display Product Identification Information

Description

The command requests the product information, which consists of manufacturer identification, model identification, revision identification, IMEI number and overall capabilities of the product.

Syntax

Command	Response
ATI	Manufacturer: <manufacturer>

	Model: <model> Revision: <revision> IMEI: <imei> +GCAP: list of <name>s OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<manufacturer>		The identification of manufacturer.
<model>		The identification of model.
<revision>		The revision identification of firmware.
<imei>		of a single line containing IMEI (International Mobile Equipment Identity) number.
<name>	+CGSM	GSM function is supported

Example

[ATI](#)

Manufacturer: RisingHF

Model: RHF4M603

Revision: RHF4M603_EU [08 27 2025 14:42:38]

IMEI: 123456789012347

+GCAP: +CGSM

OK

3.5 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<manufacturer>		The identification of manufacturer.

Example

AT+CGMI

Co.,Ltd.

OK

AT+CGMI=Shanghai

OK

AT+CGMI="Shanghai Co.,Ltd."

OK

3.6 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<name>		The identification of model.

Example

AT+CGMM

RHF4M603

OK

AT+CGMM=RHF4M603

OK

3.7 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
Maximum Response Time	300ms

Defined values

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

Example

AT+CGMR

RHF4M603_EU [08 27 2025 14:42:38]

OK

3.8 AT+CIMI Request International Mobile Subscriber Identity

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
Maximum Response Time	300ms

Defined values

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

Example

AT+CIMI

460018621323229

OK

3.9 AT^IMEI Set module IMEI

Description

The command is used to set module IMEI value.

Syntax

Command	Response
AT^IMEI=?	OK
AT^IMEI?	^IMEI: <IMEI> OK
AT^IMEI=<IMEI>	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<IMEI>		Serial number identification (14-16 位)

Example

AT^IMEI?

^IMEI: 3520990017614823

OK

AT^IMEI=357941053041368

OK

3.10 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<IMEI>		Serial number identification

Example

AT+CGSN

357941053041368

OK

3.11 AT+CCLK Real Time Clock

Description

The command is used to manage Real Time Clock of the module.

Syntax

Command	Response
AT+CCLK=<time>	OK or ERROR
AT+CCLK?	+CCLK: "<yy/MM/dd>,<hh:mm:ss[± zz]>" OK
AT+CCLK=?	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<time>		String type value; format is “yy/MM/dd, hh:mm:ss ± zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; If the MT does not support the time zone, the last three characters of the <time> will not return Support setting 1970-2070
yy	1980-2100	Year
MM	01-12	Month
dd	01-31	Day
hh	01-24	Hour
mm	00-59	Minute
ss	00-59	Second
zz	-47-+48	Time zone

Example

AT+CCLK?

+CCLK: "19/03/15,11:04:25+32"

OK

AT+CCLK="00/12/31,23:59:59+32"

OK

3.12 AT+CSCS Select TE Character Set

Description

Write command informs TA which character set <chset> is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

Read command shows current setting and test command displays conversion schemes implemented in the TA.

Syntax

Command	Response
AT+CSCS=?	+CSCS: (list of supported <chset>s) OK
AT+CSCS?	+CSCS: <chset> OK
AT+CSCS=<chset>	OK or ERROR
Maximum Response Time	300ms

Defined values

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

Example

AT+CSCS=?

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

OK

AT+CSCS="IRA"

OK

AT+CSCS?

+CSCS: "IRA"

OK

3.13 AT+IPR Set Local Baud Rate permanently

Description

This command sets the baud rate of module's serial interface permanently, after reboot the baud rate is also valid. 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<rate>	0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400	Baud rate

Example

AT+IPR?

+IPR: 115200

OK

AT+IPR=115200

OK

3.14 AT+IFC Set Local Data Flow Control

Description

This command is used to control the operation of local flow control between the DTE and DCE.

Syntax

Command	Response
AT+IFC=<n>,<m>	OK Or ERROR
AT+IFC?	+IFC: <n>,<m> OK
AT+IFC=?	+IFC: (<n>list),(<m>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<n>	0	none
	1	DC1/DC3 on circuit 103; do not pass DC1/DC3 characters to the remote DCE
	2	Circuit 133 (Ready for Receiving)
	3	DC1/DC3 on circuit 103 with DC1/DC3 characters being passed through to the remote DCE in addition to being acted upon for local flow control
<m>	0	None
	1	DC1/DC3 on circuit 104

	2	Circuit 106 (Clear to Send/Ready for Sending)
--	---	---

Example

AT+IFC?

+IFC: 2,2

OK

AT+IFC=2,2

OK

3.15 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=<n>,<m>	OK Or ERROR
AT+ICF?	+ICF: <n>,<m> OK
AT+ICF=?	+ICF: (<n>list),(<m>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
< n>	0	auto detect
	1	8 Data; 2 Stop
	2	8 Data; 1 Parity; 1 Stop
	3	8 Data; 1 Stop
	4	7 Data; 2 Stop

	5	7 Data; 1 Parity; 1 Stop
	6	7 Data; 1 Stop
<m>	0	odd
	1	even
	2	Mark
	3	none

Example

```

AT+ICF?
+ICF: 3,3

OK
AT+ICF=3,3
OK

```

3.16 AT+CSQ Signal Quality Report

Description

Execution command returns received signal strength indication <rss> 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: <rss>,<ber> OK
AT+CSQ=?	+CSQ: (<rss>list),(<ber>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<rss>	0	- 113 dBm or less

	1	- 111 dBm
	2-30	- 109... - 53 dBm
	31	-51 dBm
	99	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

Example

AT+CSQ

+CSQ: 19,99

OK

AT+CSQ=?

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

OK

3.17 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
Maximum Response Time	15s,determined by network

Defined values

Parameter	values	Explain
<fun>	0	Minimum functionality
	1	Full functionality, online mode
	3	Disable phone receive RF circuits
	4	Disable phone both transmit and receive RF circuits
	5	Disable SIM
	6	Trun off full secondary recieve
<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.

Example

AT+CFUN?

+CFUN: 1

OK

AT+CFUN=1,1

OK

3.18 AT+ICCID Read ICCID in SIM Card

Description

The command is used to Read the ICCID in SIM card.

Syntax

Command	Response
AT+ICCID	+ICCID: <ICCID>

	OK
AT+ICCID=?	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<ICCID>		Integrate circuit card identity

Example

AT+ICCID

+ICCID: 89861116040211636036

OK

3.19 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<cpas>	0	Ready (ME allows commands from TA/TE)
	2	unknown (MT is not guaranteed to respond to instructions)
	3	ringing (MT is ready for commands from TA/TE, but the

		ringer is active)
	4	call in progress (MT is ready for commands from TA/TE, but a call is in progress)

Example

[AT+CPAS](#)

+CPAS: 0

OK

Chapter 4.SIM Card Related Commands

4.1 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
Maximum Response Time	5s

Defined values

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="SC",2
```

```
+CLCK: 0
```

```
OK
```

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

```
OK
```

```
AT+CLCK="SC",2
```

```
+CLCK: 1
```

```
OK
```

4.2 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
Maximum Response Time	5s

Defined values

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+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?
+CPIN: READY //SIM card is ready

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
Maximum Response Time	5s

Defined values

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+CRSM Restricted SIM Access

Description

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

Syntax

Command	Response
AT+CRSM=<command>[,<fileID>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	+CRSM: <sw1>,<sw2>[,<response>] OK
AT+CRSM=?	+CRSM: (176,178,192,214,220,242),(12037-28599),(0-255), (0-255),(0-255),<data>,<pathid> OK
Maximum Response Time	300ms

Defined values

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.

NOTE:

Example

[AT+CRSM=242](#)

+CRSM:

144,0,62338202782183023F00A5038001718A01058B032F0605C61890017C830101830102
95010083011183010A83010B83010C81021F14

OK

4.5 AT+CIND Indicator Control

Description

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

Read command returns the status of MT indicators.

Test command returns pairs, where string value <49escry> is a maximum 16 character description of the indicator and compound value is the allowed values for the

indicator.

Currently only support network mode indicator.

Syntax

Command	Response
AT+CIND=<ind>	OK
AT+CIND?	+CIND: <ind>[,<ind>[,...]] OK
AT+CIND=?	+CIND: (“service”,(0-1)) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<ind>	0	Indicator is off
	1	Indicator is on

Example

AT+CIND?

+CIND: 0

OK

Chapter 5. Packet Domain Commands

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

The test command returns values supported as a compound value.

Syntax

Command	Response
AT+CGDCONT=<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp>]]]]]	
AT+CGDCONT?	[+CGDCONT: <cid>, <PDP_type>,<APN>,<PDP_addr>, <d_comp>,<h_comp>[,<pd1> [,…[,pdN]]] [<CR><LF>+CGDCONT: <cid>,<PDP_type>, <APN>,<PDP_addr>,<d_comp>, <h_comp>[,<pd1>[,…[,pdN]]] […]]] OK
AT+CGDCONT=?	+CGDCONT: (0-15),"IP",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1) +CGDCONT: (0-15),"IPV6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1) +CGDCONT: (0-15),"IPV4V6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1) +CGDCONT: (0-15),"PPP",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<cid>		(PDP Context Identifier) a numeric parameter which

		specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.
<PDP_type>	IP,IPV6, PPP, 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_address>		a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.
<d_comp>	0-2	a numeric parameter that controls PDP data compression (applicable for SNDTCP only) (refer 3GPP TS 44.065) 0 – off (default if value is omitted) 1 – on (manufacturer preferred compression) 2 – V.42bis Other values are reserved. Note: only support 0 and 2 now.
<h_comp>		a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 and 3GPP TS 25.323) 0 – off (default if value is omitted) 1 – RFC1144 (applicable for SNDTCP only) 2 – RFC2507 Note: only support 0 and 1 now.
<pd1>, ... <pdN>		zero to N string parameters whose meanings are specific to the <PDP_type>

Example

AT+CGDCONT?

+CGDCONT: 1,"IP","3GNET","10.14.101.192",0,0,,,

OK

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

OK

5.2 AT+CGATT PS Attach or Detach

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
Maximum Response Time	140s,determined by network

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

5.3 AT+CGACT PDP Context Activate or Deactivate

Description

The execution command is used to activate or deactivate the specified PDP context (s).

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

Syntax

Command	Response
AT+CGACT=<state>[,<cid>]	OK
AT+CGACT?	[+CGACT: <cid>,<state> [<CR><LF>+CGACT: <cid>, <state>[...]]] OK
AT+CGACT=?	+CGACT: (0,1), (<cid>list) OK
Maximum Response Time	150s,determined by network

Defined values

Parameter	values	Explain
<state>	0-1	Indicates the state of PDP context activation 0--- Deactivated 1--- Activated
<cid>	1-16	A numeric parameter which specifies a particular PDP context definition

Example

AT+CGACT?

+CGACT: 1,1

OK

AT+CGACT=?

+CGACT: (0,1), (1-16)

OK

5.4 AT+RNDISCALL For RNDIS On/Off

Description

The write command is used to activate or deactivate the RNDIS.

Syntax

Command	Response
AT+RNDISCALL=<value>	OK
AT+RNDISCALL?	+RNDISCALL: <value> OK
AT+RNDISCALL=?	+RNDISCALL: (0,1) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<value>	0	RNDIS off
	1	RNDIS on

Example

AT+RNDISCALL?

+RNDISCALL: 1

OK

AT+RNDISCALL=0

OK

5.5 AT+DIALMODE RNDIS Automatic dialing

Description

This command is used to enable or disable the automatic dialing function after RNDIS is turned on. The default value is 0. Scenes dialed using ppp need to turn off automatic dialing.

Syntax

Command	Response
AT+DIALMODE=?	+DIALMODE: (0-1) OK
AT+DIALMODE?	+DIALMODE: <mode> OK
AT+DIALMODE=<mode>	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0-1	0 --- ON 1 --- OFF

Example

AT+DIALMODE?

+DIALMODE: 0

OK

AT+DIALMODE=?

+DIALMODE: (0-1)

OK

AT+DIALMODE=1

OK

5.6 ATD*99# Initiate Data Connection

Description

This command will enable the MT to initiate a series of necessary operations to establish a communication with PDN.

Syntax

Command	Response
ATD*99#[* [<called_address>] [* [<L2P>] [* [<cid>]]]#	CONNECT 115200

Maximum Response Time	5s,determined by network
-----------------------	--------------------------

Defined values

Parameter	values	Explain
<called_address>		Ignore
<L2P>	“PPP”	
<cid>	1-24,100-179	A numeric parameter which specifies a particular PDP context definition

Example

```
ATD*99#
CONNECT 115200
```

5.7 AT+CGPADDR Show PDP Address

Description

This command will show PDP address,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: (list of defined <cid>s) OK
AT+CGPADDR	+CGPADDR: <cid>,<PDP_addr> [+CGPADDR: <cid>,<PDP_addr>[...]] OK
AT+CGPADDR[=<cid>[,<cid> >[,...]]]	+CGPADDR: <cid>,<PDP_addr> [+CGPADDR: <cid>,<PDP_addr>[...]] OK
Maximum Response Time	5s,determined by network

Defined values

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 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, "10.175.76.132"

+CGPADDR: 2, "10.174.139.166"

OK

Chapter 6. Network Service Commands

6.1 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>]]]	OK
AT+COPS?	+COPS: <mode>[,<format>,<oper>,<sys>] OK
AT+COPS=?	+COPS: [(<stat>,long<oper>,short<oper>,numeric<oper>)s][,(<mode>list),(<format>list)] OK
Maximum Response Time	180s,determined by network

Defined values

Parameter	values	Explain
<mode>	0-4	0--- Automatic mode; <oper> field is 1--- Manual operator selection. <oper> present. 2--- Force deregister 3--- Set only <format> 4--- Manual/automatic
<format>	0-2	0---Long format alphanumeric <oper> 1--- Short format alphanumeric <oper> 2--- Numeric <oper>

<oper>		String type; <format> indicates if alphanumeric or numeric
<sys>	2,7	2 --- WCDMA 7 --- LTE
<stat>	0-3	0--- unknown 1--- available 2--- current 3--- forbidden

Example

AT+COPS?

+COPS: 0,2,"46000",7

OK

6.2 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
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
-----------	--------	---------

<n>	0-3	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>],[<rac>][,<cause_type>,<reject_cause>]]
<stat>	0-11	<stat>: 0: not registered, MT is not currently searching a new operator to register to 1: registered, home network 2: not registered, but MT is currently searching a new operator to register to 3: registration denied 4: unknown 5: registered, roaming 6: registered, home network, SMS-only (applicable only when AcT is E-UTRAN) 7: registered, roaming, SMS-only (applicable only when AcT is E-UTRAN) 8: attached for emergency bearer services only (not applicable) 9: registered for “CSFB not preferred”,home network(applicable only when AcT is E-UTRAN) 10: registered for “CSFB not preferred”,roaming (applicable only when AcT is E-UTRAN) 11: only emergency services are available
<lac>		string type; two byte location area code in hexadecimal format
<ci>		string type; four byte cell identifier in hexadecimal format. GSM case: 16 least significant bits ,WCDMA case: CellId – 16 least significant bits ,RNCID – 12 most significant bits
<AcT>	0-8	0 --- GSM 1 --- GSM Compact 2 --- UTRAN 3 --- GSM w/EGPRS 4 --- UTRAN w/HSDPA 5 --- UTRAN w/HSUPA 6 --- UTRAN w/HSDPA and HSUPA 7 --- E-UTRAN 8 --- UTRAN HSPA+

Example

AT+CREG?

+CREG: 0,1

OK

AT+CREG=?

+CREG: (0-3)

OK

6.3 AT+CGREG GPRS Network Registration Status

Description

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

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

Syntax

Command	Response
AT+CGREG=[<n>]	OK
AT+CGREG?	+CGREG: <n>,<stat>[,<lac>,<ci>,<AcT>,<rac>][,<cause_type>,<reject_cause>]] OK
AT+CGREG=?	+CGREG: (0,3) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<n>		0: disable network registration unsolicited result code 1: enable network registration unsolicited result code +CGREG: <stat> 2: enable network registration and location information

		unsolicited result code +CGREG: <stat>[,<lac>,<ci>,<AcT>,<rac>] 3: enable network registration, location information and cause value information unsolicited result code +CGREG:
<stat>	0-11	<stat>: 0: not registered, MT is not currently searching a new operator to register to 1: registered, home network 2: not registered, but MT is currently searching a new operator to register to 3: registration denied 4: unknown 5: registered, roaming 6: registered, home network, SMS-only (applicable only when AcT is E-UTRAN) 7: registered, roaming, SMS-only (applicable only when AcT is E-UTRAN) 8: attached for emergency bearer services only (not applicable) 9: registered for "CSFB not preferred",home network(applicable only when AcT is E-UTRAN) 10: registered for "CSFB not preferred",roaming (applicable only when AcT is E-UTRAN) 11: only emergency services are available
<lac>		string type; two byte location area code in hexadecimal format
<ci>		string type; four byte cell identifier in hexadecimal format. GSM case: 16 least significant bits ,WCDMA case: CellId – 16 least significant bits ,RNCID – 12 most significant bits
<AcT>	0-8	0 --- GSM 1 --- GSM Compact 2 --- UTRAN 3 --- GSM w/EGPRS 4 --- UTRAN w/HSDPA 5 --- UTRAN w/HSUPA 6 --- UTRAN w/HSDPA and HSUPA 7 --- E-UTRAN 8 --- UTRAN HSPA+

Example

AT+CGREG?

+CGREG: 3,1,"e802","00bd8515",7

OK

AT+CGREG=?

+CGREG: (0,3)

OK

6.4 AT+CEREG EPS network registration status

Description

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in EUTRAN, or unsolicited result code +CEREG: <stat>,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in E-UTRAN. The parameters <AcT>, <tac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [<cause_type>,<reject_cause>], when available, when the value of <stat> changes.

NOTE 1: If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>, <ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [<cause_type>,<reject_cause>], if available, are returned when <n>=3. Test command returns values supported as a compound value.

Syntax

Command	Response
AT+CEREG=?	+CEREG: (0-3) OK
AT+CEREG?	+CEREG: <n>,<stat>,[<tac>],[<ci>],[<AcT>] [,<cause_type>,<reject_cause>]] OK
AT+CEREG=<n>	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<n>	0-3	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>]]
<stat>	0-11	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 (See NOTE 2) 9 --- registered for “CSFB not preferred” , home network (not applicable) 10 --- registered for “CSFB not preferred” , roaming (not applicable) 11 --- emergency bearer services only
<tac>		string type; two byte tracking area code in hexadecimal format (e.g. “00C3” equals 195 in decimal)
<ci>		string type; four byte E-UTRAN cell ID in hexadecimal format
<AcT>	0-8	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 (see NOTE 3) (not applicable) 4 --- UTRAN w/HSDPA (see NOTE 4) (not applicable) 5 --- UTRAN w/HSUPA (see NOTE 4) (not applicable) 6 --- UTRAN w/HSDPA and HSUPA (see NOTE 4) (not

		applicable) 7 --- E-UTRAN 8 --- UTRAN HSPA+
<cause_type>	0-1	integer type; indicates the type of <reject_cause>. 0 --- Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A. 1 --- Indicates that <reject_cause> contains a manufacturer-specific cause.
<reject_cause>		integer type; contains the cause of the failed registration. The value is of type as defined by <cause_type>.

Example**AT+CEREG?**

+CEREG: 3,1,"18be","08608021",7

OK

6.5 AT^SYSINFO Query System Information**Description**

This command inquires the current system information. Such as system service status, domain, roaming, system mode, UIM card status, etc.

Syntax

Command	Response
AT^SYSINFO	^SYSINFO: <srv_status>,<srv_domain>,<roam_status>,<sys_mode>,<sim_state>[,<reg_mode>] OK
Maximum Response Time	300ms

Defined values

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
Searching network	0-1	0--- Roaming off 1--- Roaming on
<sys_mode>	0-3	0--- No service 3--- GSM mode 5--- WCDMA mode 9--- LTE mode
<sim_state>	0-1	0--- SIM is not available 1--- SIM is available 255--- SIM is available

Example

AT^SYSINFO

^SYSINFO: 2,3,0,9,1 //LTE mode

OK

6.6 AT^SYSCONFIG Set System Parameter

Description

This command allows user to configure system parameter, access network mode, access network order, support roaming or not, service network domain.

Syntax

Command	Response
AT^SYSCONFIG=<mode_pre f>,<acq_pref>,<roam_pref>,< domain_pref>	OK
AT^SYSCONFIG?	^SYSCONFIG: <mode_pref>,<acq_pref>,<roam_pref>,< domain_pref>

	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode_pref>	2,14,16 38,54,99	Integer type, mode preferences: 2 --- Automatic 14--- WCDMA only 16--- No Change 38--- LTE only 99--- Unknow
<acq_pref>	0,2,3,4	Integer type, indicate access network order 0--- Automatic 2--- WCDMA, LTE WCDMA preferred 3--- No change 4--- Unknown
<roam_pref>	0-3	0--- Forbid roam 1--- Allow roam 2--- No change 3--- Unknown
<domain_pref>	0-4	0--- CS only 1--- PS only 2--- CS and PS 3--- Any 4--- No Change 5--- Unknown

Example

AT^SYSCONFIG?

^SYSCONFIG: 2,2,1,2

OK

6.7 AT^MODECONFIG Network Mode Selection

Description

The set command select system mode for MT ,don't need SIM card, and immediately available.

Read command returns the current system mode.

Syntax

Command	Response
AT^MODECONFIG=<mode>	OK
AT^MODECONFIG?	^MODECONFIG: 2 OK
AT^MODECONFIG=?	^MODECONFIG: <mode>list OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	2,14 ,38,5 5,56	2 ---AUTO 14 --- WCDMA only 38--- LTE only 55---UMTS_LTE, UMTS preferred 56--- UMTS_LTE, LTE preferred

Example

AT^MODECONFIG?

^MODECONFIG: 2

OK

6.8 AT+CEMODE EPS Registry Settings

Description

The set command used to set the MT corresponding to the EPS registration, the command affect after reboot.

Read command returns the current EPS registration mode.

Syntax

Command	Response
AT+CEMODE?	+CEMODE: <mode> OK
AT+CEMODE=?	+CEMODE: (<mode>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0-3	0 --- EPS attach only, UE is data centric 1 --- Combined attach, UE is voice centric 2 --- Combined attach, UE is data centric 3 --- EPS attach only, UE is voice centric

Example

AT+CEMODE?

+CEMODE: 2

OK

AT+CEMODE=?

+CEMODE: (0-3)

OK

6.9 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>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<E-UTRAN_AcT>]]]]	OK
AT+CPOL?	+CPOL: <index>,<format>,<oper> [...] OK
AT+CPOL=?	+CPOL: (<index>list),(<format>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<index>	1-254	Integer type, the order number of oper 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 alphanumeric or numeric.
<GSM_AcT>	0-1	GSM access technology: 0--- access technology not selected 1--- access technology selected
<GSM_Compact_AcT>	0-1	GSM compact access technology: 0--- access technology not selected 1--- access technology selected
<UTRAN_AcT>	0-1	UTRAN access technology: 0--- access technology not selected 1---access technology selected
<E-UTRAN_AcT>	0-1	integer type;E-UTRAN access technology 0---access technology not selected 1--- access technology selected

Example

AT+CPOL?

+CPOL: 1,2, "46001", 0, 0, 1, 0

```
+CPOL: 2, 2, "46009", 0, 0, 1, 0
```

```
OK
```

6.10 AT+EEMGINFO Query GSM/UMTS/LTE information

Description

Query GSM/UMTS/LTE information in Engineering Mode. Only valid in query mode. Before executing this command, you need to enter the engineering mode with the command AT+CGED=2.

Syntax

Command	Response
AT+EEMGINFO?	+EEMGINFO : <state>,<nw_type> OK
AT+EEMGINFO=<type>	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<state>	0-3	0 --- ME in Idle mode 1 --- ME in Dedicated mode 2 --- ME in PS PTM mode 3 --- Invalid state
<nw_type>	0-2	0 --- GSM 1 --- UMTS 2 --- LTE
<type>	0-1	0 --- not force, may include Ncell info 1 --- force to decode system info to get Ncell info

Example

```
AT+EEMGINFO?
+EEMGINFO : 3, 2
OK
```


6.10.1 +EEMLTESVC Serving-cell information in LTE

Description

Indication of serving-cell information in LTE Engineering Mode.

Syntax

Command
+EEMLTESVC: <mcc>, <lenOfMnc>, <mnc>, <tac>, <phyCellId>, <dlEuArfcn>, <ulEuArfcn>, <band>, <dlBandwidth>, <rsrp>, <rsrq>, <sinr>, <errcModeState>, <emmState>, <serviceState>, <IsSingleEmmRejectCause>, <EMMRejectCause>, <mmeGroupId>, <mmeCode>, <mTmsi>, <cellId>, <subFrameAssignType>, <specialSubframePatterns>, <transMode>, <mainRsrp>, <diversityRsrp>, <mainRsrq>, <diversityRsrq>, <rssi>, <cqi>, <pathLoss>, <tb0DlTpt>, <tb1DlTpt>, <tb0DlPeakTpt>, <tb1DlPeakTpt>, <tb0UlPeakTpt>, <tb1UlPeakTpt>, <dlThroughPut>, <dlPeakThroughPut>, <averDlPRB>, <averCQITb0>, <averCQITb1>, <rankIndex>, <grantTotal>, <ulThroughPut>, <ulPeakThroughPut>, <currPuschTxPower>, <averUlPRB>, <dlBler>, <ulBler>

Defined values

Parameter	values	Explain
<mcc>		Mobile Country Code(十进制)
<lenOfMnc>		length of mnc
<mnc>		Mobile Network Code
<tac>		Tracking area code
<phyCellId>		Physical Cell Identifier
<dlEuArfcn>		dl arfcn
<ulEuArfcn>		ul arfcn
<band>		band
<dlBandwidth>		dl band width
<rsrp>		rsrp
<rsrq>		rsrq
<sinr>		sinr
<errcModeState>		ErrcModeState
<emmState>		emmState
<serviceState>		serviceState
<IsSingleEmmRejectCause>		IsSingleEmmRejectCause
<EMMRejectCause>		EMMRejectCause
<mmeGroupId>		mmeGroupId
<mmeCode>		mmeCode>
<mTmsi>		mTmsi
<cellId>		cellId
<subFrameAssignType>		subFrameAssignType

<specialSubframePatterns>		specialSubframePatterns
<transMode>		transMode
<mainRsrp>		ainRsrp
<diversityRsrp>		diversityRsrp
<mainRsrq>		mainRsrq
<diversityRsrq>		iversityRsrq
<rssi>		rssi
<cqi>		cqi
<pathLoss>		pathLoss
<tb0DlTpt>		tb0DlTpt
<tb1DlTpt>		tb1DlTpt
<tb0DlPeakTpt>		tb0DlPeakTpt
<tb1DlPeakTpt>		tb1DlPeakTpt
<tb0UlPeakTpt>		tb0UlPeakTpt
<tb1UlPeakTpt>		tb1UlPeakTpt
<dlThroughPut>		dlThroughPut
<dlPeakThroughPut>		dlPeakThroughPut
<averDlPRB>		averDlPRB
<averCQITb0>		averCQITb0
<averCQITb1>		averCQITb1
<rankIndex>		rankIndex
<grantTotal>		grantTotal
<ulThroughPut>		ulThroughPut
<ulPeakThroughPut>		ulPeakThroughPut
<currPuschTxPower>		currPuschTxPower
<averUlPRB>		averUlPRB
<dlBler>		dlBler
<ulBler>		ulBler

Example

```
+EEMLTESVC: 1120, 2, 17, 23324, 372, 100, 18100, 1, 5, 49, 25, 20, 2, 10, 13, 1, 0, 12544,
4, 3775713504, 186088834, 255, 255, 1, 255, 255, 255, 255, 255, 65535, 107, 4816, 0, 4816,
0, 0, 0, 0, 0, 4, 15, 0, 0, 459, 0, 0, 18, 2, 0, 0
```

6.10.2 +EEMLTEINTRA Intra freq information in LTE

Description

Indication of Intra freq information in LTE Engineering Mode.

Syntax

Command
+EEMLTEINTRA: <p1>, <p2>, <p3>, <p4>, <p5>

Defined values

Parameter	values	Explain
<p1>		index of ENGMODE INTERFREQ
<p2>		phyCellId
<p3>		euArfcn
<p4>		rsrp
<p5>		rsrq

Example

```
+EEMLTEINTRA: 0, 66, 1300, 37, 15
```

6.10.3 +EEMLTEINTER Inter freq information in LTE**Description**

Indication of Inter freq information in LTE Engineering Mode.

Syntax

Command
+EEMLTEINTER: <p1>, <p2>, <p3>, <p4>, <p5>

Defined values

Parameter	values	Explain
<p1>		index of ENGMODE INTERFREQ
<p2>		phyCellId
<p3>		euArfcn, refer to AT+CESQ for conversion
<p4>		rsrp, refer to AT+CESQ for conversion
<p5>		rsrq, refer to AT+CESQ for conversion

Example

```
+EEMLTEINTER: 0, 175, 2452, 37, 15
```

```
+EEMLTEINTER: 1, 89, 2452, 33, 8
```

6.10.4 +EEMLTEINTERRAT Inter RAT information

Description

Indication of inter RAT information in LTE Engineering Mode.

Syntax

Command
+EEMLTEINTERRAT: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>[,<p10>]

Defined values

Parameter	values	Explain
<p1>	0-1	0 --- GSM 1 --- UMTS
<p2>		number of INTERRAT.
<p3>		mcc
<p4>		mnc
<p5>		lac
<p6>		ci
<p7>		arfcn(GSM)/uarfcn(UMTS)
<p8>		bsic(GSM)/ psc_cellParameterId(UMTS)
<p9>		rssi(GSM)/ rscp(UMTS)
<p10>		cpichEcN0(UMTS)

Example

```
+EEMLTEINTERRAT:0,16,1120,0,6334,20549,6,13,-55,0,0,65534,-1,14,255,-77,0,0,65534,-1,18,255,-83,0,0,65534,-1,24,255,-86,0,0,65534,-1,62,255,-90,0,0,65534,-1,21,255,-90,0,0,65534,-1,56,255,-90,0,0,65534,-1,64,255,-94,0,0,65534,-1,49,255,-96,0,0,65534,-1,633,255,-96,0,0,65534,-1,0,255,-101,0,0,65534,-1,36,255,-102,0,0,65534,-1,628,255,-106,0,0,65534,-1,631,255,-110,0,0,65534,-1,635,255,-111,0,0,65534,-1,624,255,-111
```

6.10.5 +EEMUMTSSVC serving-cell information in UMTS

Description

Indication of serving-cell information in UMTS Engineering Mode.

Syntax

Command
+EEMUMTSSVC: <mode>, <sCellMeasPresent>, <sCellParamPresent>, <ueOpStatusPresent>, <rscp>, <utraRssi>, <cpichEcN0>, <sQual>, <sRxLev>, <txPower>, <rac>, <nom>, <mcc>, <lenOfMnc>, <mnc>, <lac>, <ci>, <uraId>,

<psc_cellParameterId>, <arfcn>, <t3212>, <t3312>, <hcsUsed>, <attDetAllowed>, <csDrxCycleLen>, <psDrxCycleLen>, <utranDrxCycleLen>, <HSDPASupport>, <HSUPASupport>, <rrcState>, <numLinks>, <srncId>, <sRnti>, <algPresent>, <cipherAlg>, <cipherOn>, <algPresent>, <cipherAlg>, <cipherOn>, <HSDPAAActive>, <HSUPAAActive>, <MccLastRegisteredNetwork>, <MncLastRegisteredNetwork>, <TMSI>, <PTMSI>, <IsSingleMmRejectCause>, <IsSingleGmmRejectCause>, <MMRejectCause>, <GMMRejectCause>, <mmState>, <gmmState>, <gprsReadyState>, <readyTimerValueInSecs>, <NumActivePDPCContext>, <ULThroughput>, <DLThroughput>, <serviceStatus>, <pmmState>, <LAU_status>, <LAU_count>, <RAU_status>, <RAU_count>

Defined values

Parameter	values	Explain
<mode>		Engineer Mode
<sCellMeasPresent>		sCellMeasPresent
<sCellParamPresent>		sCellParamPresent
<ueOpStatusPresent>		ueOpStatusPresent
<rscp>		rscp
<utraRssi>		utraRssi
<cpichEcN0>		cpichEcN0
<sQual>		sQual
<sRxLev>		sRxLev
<txPower>		txPower
<rac>		rac
<nom>		nom
<mcc>		mcc
<lenOfMnc>		Length Of Mnc
<mnc>		mnc
<lac>		lac
<ci>		ci
<uraId>		uraId
<psc_cellParameterId>		psc_cellParameterId
<arfcn>		arfcn
<t3212>		t3212
<t3312>		t3312
<hcsUsed>		hcsUsed
<attDetAllowed>		attDetAllowed

<csDrxCycleLen>		csDrxCycleLen
<psDrxCycleLen>		psDrxCycleLen
<utranDrxCycleLen>		utranDrxCycleLen
<HSDPASupport>		HSDPASupport
<HSUPASupport>		HSUPASupport
<rrcState>		rrcState
<numLinks>		numLinks
<srncId>		srncId
<sRnti>		sRnti
<algPresent>		algPresent
<cipherAlg>		cipherAlg
<cipherOn>		cipherOn
<algPresent>		algPresent
<cipherAlg>		cipherAlg
<cipherOn>		cipherOn
<HSDPAAActive>		HSDPAAActive
<HSUPAAActive>		HSUPAAActive
<MccLastRegisteredNetwork>		MccLastRegisteredNetwork
<MncLastRegisteredNetwork>		MncLastRegisteredNetwork
<TMSI>		TMSI
<PTMSI>		PTMSI
<IsSingleMmRejectCause>		IsSingleMmRejectCause
<MMRejectCause>		MMRejectCause
<GMMRejectCause>		GMMRejectCause
<mmState>		mmState
<gmmState>		gmmState
<gprsReadyState>		gprsReadyState
<readyTimerValueInSecs>		readyTimerValueInSecs
<NumActivePDPCContext>		NumActivePDPCContext>
<ULThroughput>		ULThroughput
<DLThroughput>		DLThroughput
<serviceStatus>		serviceStatus
<pmmState>		pmmState
<LAU_status>		LAU_status
<LAU_count>		LAU_count
<RAU_status>		RAU_status
<RAU_count>		RAU_count

Example

```
+EEMUMTSSVC: 3, 1, 1, 1, -4096, 41, -4096, -32768, -32768, 0, 0, 3, 1120, 0, 1, 43063,
45342, 65535, 139, 10713, 60, 0, 0, 1, 65535, 65535, 65535, 0, 0, 6, 1, 219, 55626, 0, 0, 0, 0,
0, 1, 0, 0, 0, 0, 1053756281, 4157227662, 1, 1, 28672, 255, 191, 29, 0, 65535, 0, 0, 0, 0, 2, 0,
0, 0, 0
```

6.10.6 +EEMGINFOBASIC GSM Basic information

Description

Indication of basic information in GSM Engineering Mode.

Syntax

Command
+EEMGINFOBASIC: <state>

Defined values

Parameter	values	Explain
<state>	0-2	0: ME in Idle mode 1: ME in Dedicated mode 2: ME in PS PTM mode

Example

```
+EEMGINFOBASIC: 0
```

6.10.7 +EEMUMTSINTRA Intra freq information in UMTS

Description

Indication of Intra freq information in UMTS Engineering Mode.

Syntax

Command
+EEMUMTSINTRA: <index>, <rscp>, <utraRssi>, <cpichEcN0>, <sQual>, <sRxLev>, <mcc>, <mnc>, <lac>, <ci>, <arfcn>, <psc_cellParameterId>

Defined values

Parameter	values	Explain

Example

```
+EEMUMTSINTRA: 0, -62, -1, -2, -32768, -32768, 65535, 65535, 65534, 0, 10713, 139
```

```
+EEMUMTSINTRA: 1, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 8, 10713, 127
```

```
+EEMUMTSINTRA: 2, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 9, 10713, 128
```

```
+EEMUMTSINTRA: 3, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 10, 10713, 129
```

```
+EEMUMTSINTRA: 4, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 11, 10713, 144
```

```
+EEMUMTSINTRA: 5, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 13, 10713, 281
```

```
+EEMUMTSINTRA: 6, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 14, 10713, 283
```

```
+EEMUMTSINTRA: 7, -32768, -1, -32768, -32768, -32768, 65535, 65535, 65534, 15, 10713, 256
```

6.10.8 +EEMGINFOPS PS information in GSM

Description

Indication of PS information in GSM Engineering Mode.

Syntax

Command
+EEMGINFOPS: <PS_attached>, <attach_type>, <service_type>, <tx_power>, <c_value>, <ul_ts>, <dl_ts>, <ul_cs>, <dl_cs>, <ul_modulation>, <dl_modulation>, <gmsk_cv_bep>, <8psk_cv_bep>, <gmsk_mean_bep>, <8psk_mean_bep>, <EDGE_bep_period>, <single_gmm_rej_cause>, <pdp_active_num>, <mac_mode>, <network_control>, <network_mode>, <EDGE_slq_measurement_mode>, <edge_status>

Defined values

Parameter	values	Explain
<PS_attached>		GPRS/EDGE attached

<attach_type>		Attach type
<service_type>		Service type
<tx_power>		Transmit power
<c_value>		C value
<ul_ts>		Uplink timeslot
<dl_ts>		Downlink timeslot
<ul_cs>		Uplink Coding Scheme
<dl_cs>		Downlink Coding Scheme
<ul_modulation>		Uplink modulation
<dl_modulation>		Downlink modulation
<gmsk_cv_bep>		GMSK CV BEP(Block Error Probability)
<8psk_cv_bep>		8PSK CV BEP
<gmsk_mean_bep>		GMSK mean BEP
<8psk_mean_bep>		8PSK mean BEP
<EDGE_bep_period>		EDGE BEP period
<single_gmm_rej_cause>		Is single GMM reject cause
<pdp_active_num>		Activated PDP number
<mac_mode>		MAC mode
<network_control>		Network control
<network_mode>		network mode
<EDGE_slq_measurement_mode>		EDGE SLQ measurement mode
<edge_status>		EDGE status

Example

```
+EEMGINFOPS: 0, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0
```

6.10.9 +EEMGINFONC neighbour-cell information in GSM

Description

Indication of neighbour-cell information in GSM Engineering Mode.

Syntax

Command
+EEMGINFONC:<nc_num>,[<mcc>, <mnc>, <lac>, <rac>, <ci>, <rx_lv>, <bsic>,<C1>, <C2>, <arfcn>,<C31>, <C32>, [...]]

Defined values

Parameter	values	Explain
-----------	--------	---------

<nc_num>		Neighbor cell number
<mcc>		Mobile Country Code
<mnc>		Mobile Network Code
<lac>		Location Area Code
<rac>		Routing Area Code
<ci>		Cell Identifier
<rx_lv>		Receive signal level
<bsic>		Base Station Identity Code
<C1>		C1 value
<C2>		C2 value
<arfcn>		Absolute Radio Frequency Channel
<C31>		C31 value
<C32>		C32 value

Example

```
+EEMGINFONC: 0, 0, 0, 0, 0, 0, 23, 255, 0, 0, 566, 0, 0
```

```
+EEMGINFONC: 1, 0, 0, 0, 0, 0, 20, 255, 0, 0, 576, 0, 0
```

```
+EEMGINFONC: 2, 1120, 0, 6319, 0, 31528, 19, 23, 7, 103, 62, 0, 103
```

```
+EEMGINFONC: 3, 1120, 0, 6334, 0, 20520, 19, 21, 11, 117, 56, 0, 117
```

```
+EEMGINFONC: 4, 1120, 0, 6334, 0, 20521, 18, 30, 10, 110, 64, 0, 110
```

```
+EEMGINFONC: 5, 1120, 0, 6334, 0, 0, 18, 31, 10, 116, 49, 0, 116
```

6.10.10 +EEMGINBFTM Notify current network status

Description

To notify current network status which used for EFEM.

Syntax

Command
+EEMGINBFTM: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,<p15>,<p16>,<p17>,<p18>,<p19>

Defined values

Parameter	values	Explain
<p1>		Engineering Mode
<p2>		mcc
<p3>		mnc
<p4>		lac
<p5>		ci
<p6>		bsic
<p7>		C1
<p8>		C2
<p9>		Timing advance
<p10>		TxPowerLevel
<p11>		rxSigLevel
<p12>		rxSigLevelFull
<p13>		rxSigLevelSub
<p14>		rxQualityFull
<p15>		rxQualitySub
<p16>		arfcnTch
<p17>		hopping status
<p18>		channel type
<p19>		Server Timeslot

Example

```
+EEMGINBFTM: 0, 1120, 0, 6334, 20549, 13, 48, 148, 0, 0, 56, 0, 0
```

6.10.11 +EEMGINFOGMM Mobility management information

Description

Indication of mobility management information in GSM Engineering Mode.

Syntax

Command
+EEMGINFOGMM: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,<p15>,<p16>

Defined values

Parameter	values	Explain
<p1>		MccLastRegisteredNetwork

<p2>		MncLastRegisteredNetwork
<p3>		TMSI
<p4>		PTMSI
<p5>		IsSingleMmRejectCause
<p6>		MMRejectCause
<p7>		currentBandMode
<p8>		mmState
<p9>		gmmState
<p10>		gprsReadyStatus
<p11>		readyTimerValueInSecs
<p12>		serviceStatus
<p13>		LAUStatus
<p14>		LAUCount
<p15>		RAUStatus
<p16>		RAUCount

Example

```
+EEMGINFOMMM: 1120, 0, 729148266, -302761875,1, 28672, 6,191, 10, 2, 120, 0, 0, 0
```

6.10.12 +EEMGINFOSVC Serving-cell information in GSM

Description

Indication of serving-cell information in GSM Engineering Mode.

Syntax

Command
+EEMGINFOSVC: <mcc>, <mnc>, <lac>, <ci>, <nom>, <nco>, <bsic>, <C1>, <C2>, <TA>, <TxPwr>, <RxSig>, <RxSigFull>, <RxSigSub>, <RxQualFull>, <RxQualSub>, <ARFCN_tch>, <hopping_chnl>, <chnl_type>, <TS>, <PacketIdle>, <rac>, <arfcn>, <bs_pa_mfrms>, <C31>, <C32>, <t3212>, <t3312>, <pbccch_support>, <EDGE_support>, <ncc_permitted>, <rl_timeout>, <ho_count>, <ho_succ>, <chnl_access_count>, <chnl_access_succ_count>, <gsmBand>, <chanl_mode>

Defined values

Parameter	values	Explain
<mcc>		Mobile Country Code
<mnc>		Mobile Network Code
<lac>		Location Area Code
<ci>		Cell Identifier
<nom>		Network Operation Mode

<nco>		Network Control Order
<bsic>		Base Station Identity Code
<C1>		C1 value
<C2>		C2 value
<TA>		Timing Advance
<TxPwr>		Transmit Power
<RxSig>		Receive level BCCH
<RxSigFull>		Receive level for full set of TCH
<RxSigSub>		Receive level for sub set of TCH
<RxQualFull>		BER in DTX mode
<RxQualSub>		BER in non-DTX mode
<ARFCN_tch>		Traffic Channel ARFCN(Absolute Radio Frequency Channel)
<hopping_chnl>		Channel is hopping
<chnl_type>		Channel type
<TS>		Serving timeslot
<PacketIdle>		In packet idle mode
<rac>		Routing Area Code
<arfcn>		Absolute Radio Frequency Channel
<bs_pa_mfrms>		BS PA frames
<C31>		C31 value
<C32>		C32 value
<t3212>		timeout No. 3212
<t3312>		timeout No. 3312
<pbccch_support>		Support PBCCH
<EDGE_support>		Support EDGE
<ncc_permitted>		NCC permitted
<rl_timeout>		Radio link timeout
<ho_count>		Total hand-over count
<ho_succ>		Success hand-over count
<chnl_access_count>		Total channel access count
<chnl_access_succ_count>		Success channel access count
<gsmBand>		gsm band
<chanl_mode>		mode of dedicated channel

Example

```
+EEMGINFOSVC: 1120, 0, 6334, 20549, 2, 0, 13, 48, 148, 0, 0, 56, 0, 0, 0, 0, 0, 0, 0, 2, 1, 1, 6, 2, 0, 148, 30, 54, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0
```

6.11 AT*CELL Activate or to deactivate Cell/Frequency lock

Description

This proprietary AT command is used to requests to activate or to deactivate Cell/Frequency lock.

Syntax

Command	Response
AT*CELL=<mode>,<act>,<band> ,<freq>,<cellId>	OK
AT*CELL=?	*CELL:<mode>,<act>,<band>,<freq>,<cellId> OK
Maximum Response Time	300ms

Defined values

Parameter		values	Explain
<mode>		0-2	0 --- Cell/Frequency disabled 1 --- Frequency lock enabled 2 --- Cell lock enabled
<act>			0 --- GSM 1 --- UMTS_TD 2 --- UMTS_WB 3 --- LTE
<band>	UMTS	0-8	0 --- Band_1 1 --- Band_2 2 --- Band_3 3 --- Band_4 4 --- Band_5 5 --- Band_6 6 --- Band_7 7 --- Band_8 8 --- Band_9
	LTE	0-63	FDDLTE --- 0~30 TDDLTE --- 32~43 0-63 --- Band1~Band64
<freq>	UMTS		Band_1 arfcn 10562-10838 Band_2 arfcn 9662-9938 Band_3 arfcn 1162-1513 Band_4 arfcn 1537-1738 Band_5 arfcn 4357-4458 Band_6 arfcn 4387-4413 Band_7 arfcn 2237-2563 Band_8 arfcn 2937-3088 Band_9 arfcn 9237-9387

	LTE		Band_1: 0-599 Band_3: 1200-1949 Band_5: 2400-2649 Band_7: 2750-3449 Band_8: 3450-3799 Band_13: 5180-5279 Band_17: 5730-5849 Band_20: 6150-6449 Band_38: 37750-38249 Band_39: 38250-38649 Band_40: 38650-39649 Band_41: 39650-41589
<cellId>	UMTS	0-127	CELL ID: 0-127
	LTE	0-503	CELL ID: 0-503

Example

```
AT*CELL=1,3,0,100
```

```
OK
```

```
AT*CELL=1,3,0,100,372
```

```
OK
```

6.12 AT*BAND Controls user mode and band settings

Description

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

The new parameters will be saved in NVM

UE will be reset to apply the new settings.

Syntax

Command	Response
AT*BAND=[<mode>[<GSMband>,<UMTSband>,<LTEbandH>,<LTEbandL>[,<roamingConfig>,<srvDomain>,<bandPriorityFlag>]]]	OK
AT*BAND?	*BAND :<mode>,<GSMband>,<UMTSband>,<LTEbandH>,<LTEbandL>,<roamingConfig>,<srvDomain>,<bandPriorityFlag> OK

AT*BAND=?	*BAND: (list of supported<mode>s),<GSMband>, <UMTSband>,<LTEbandH>,<LTEbandL>,<bandPriority Flag >,<srvcDomain>,< bandPriorityFlag > OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0-15	<mode>: integer type 0 – GSM network 1 – UMTS network 2 – Dual mode(GSM and UMTS) (auto) 3 – Dual mode(GSM and UMTS) (GSM preferred) 4 – Dual mode(GSM and UMTS) (UMTS preferred) 5 – LTE network 6 – Dual mode(GSM and LTE)(auto) 7 – Dual mode(GSM and LTE)(GSM preferred) 8 – Dual mode(GSM and LTE)(LTE preferred) 9 – Dual mode(UMTS and LTE)(auto) 10 – Dual mode(UMTS and LTE)(UMTS preferred) 11 – Dual mode(UMTS and LTE)(LTE preferred) 12 – Trip mode(auto) 13 – Trip mode(GSM preferred) 14 – Trip mode(TD preferred) 15 – Trip mode(LTE preferred)
<GSMband>		<GSMband>: integer type <GSMband> is a sum of integers each representing a GSM band (in other words bit mask) 1 – PGSM 900 (standard or primary) 2 – DCS GSM 1800 4 – PCS GSM 1900 8 – EGSM 900 (extended) 16 – GSM 450 32 – GSM 480 64 – GSM 850 512 - BAND_LOCK_BIT // used for GSM band setting Notes: About GSM bandsetting: AT*band=0,(BAND_LOCK_BIT+ GSMband) Example: AT*band=0,513 // set PGSM 900(512 -BAND_LOCK_BIT, 1 –PGSM 900)
<UMTSband>		<UMTSband>: integer type <UMTSband> is a sum of integers each representing a UMTS band (in other words bit mask) 1 – UMTS_BAND_1 2 – UMTS_BAND_2

		4 – UMTS_BAND_3 8 – UMTS_BAND_4 16 – UMTS_BAND_5 32 – UMTS_BAND_6 64 – UMTS_BAND_7 128 – UMTS_BAND_8 256 – UMTS_BAND_9
<LTEbandH>		<LTEbandH>: integer type <LTEbandH> is a sum of integers each representing a TDD LTE band (in other words bit mask) 2 - TDLTE_BAND_34 32 – TDLTE_BAND_38 64 – TDLTE_BAND_39 128 – TDLTE_BAND_40 256 – TDLTE_BAND_41
<LTEbandL>		<LTEbandL> integer type <LTEbandL> is a sum of integers each representing a FDD LTE band (in other words bit mask) 1 – FDDLTE_BAND_1 4 – FDDLTE_BAND_3 8 – FDDLTE_BAND_4 16 – FDDLTE_BAND_5 64 – FDDLTE_BAND_7 128 – FDDLTE_BAND_8 65536 – FDDLTE_BAND_17 524288 – FDDLTE_BAND_20
<roamingConfig>		<roamingConfig>: integer value 0 – not support 1 – support 2 – no change
<srvDomain>		<srvDomain>: integer value 0 – CS only 1 – PS only 2 – CS and PS 3 – ANY 4 – no change
<bandPriorityFlag >		<bandPriorityFlag> 0 – default 1 – TD-LTE 2 – FDD-LTE

Example

AT*BAND?

*BAND:11,78,147,482,149,0,2,2

OK

```
AT*BAND=5,0,0,482,0,0,2,1 // lock B34/38/39/40/41
OK
```

6.13 AT*BANDIND Indicates the current band

Description

The command is used to indicates the current band.

Syntax

Command	Response
AT*BANDIND=[<n>]	OK
AT*BANDIND?	*BANDIND: <n>[,<band>,<AcT>] OK
AT*BANDIND=?	*BANDIND: (0,1) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<n>	0-1	When enable band indications and the band changes,there will be indication *BANDIND: <band>, <AcT>
<band>		gsmBand: 0 --- PGSM 900 1 --- DCS_BAND 2 --- PCS_BAND 3 --- EGSM_BAND 4 --- GSM_450_BAND 5 --- GSM_480_BAND 6 --- GSM_850_BAND umtsBand = returned band value +1 lteBand = returned band value
<AcT>	0-8	<AcT> access technology selected: 0 --- GSM 1 --- GSM Compact 2 --- UTRAN 3 --- GSM EGPRS 4 --- UTRAN HSDPA 5 --- UTRAN HSUPA 6 --- UTRAN HSPA 7 --- EUTRAN 8 --- UTRAN HSPA+

Example

AT*BANDIND?

*BANDIND: 0, 40, 7

OK

AT*BANDIND=1

*BANDIND: 40, 7

OK

*BANDIND: 1, 7 // band is changed

6.14 AT+EEMRPTFLAG enable the EEM information report

Description

The command is used to enable and disable the EMM information report.

Syntax

Command	Response
AT+EEMRPTFLAG[=<mode>]	OK
AT+EEMRPTFLAG?	+EEMRPTFLAG: <mode> OK
AT+EEMRPTFLAG=?	+EEMRPTFLAG: (<mode>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0	Disable the EMM information report
	1	Enable the EMM information report

Example

AT+EEMRPTFLAG=?

+EEMRPTFLAG: (0-1)

OK

AT+EEMRPTFLAG=1

OK

6.15 AT+CESQ Received signal quality

Description

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

Syntax

Command	Response
AT+CESQ	+CESQ: <rsqi>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> OK
AT+CESQ=?	+CESQ: (range of supported <rsqi>s),(rangeofsupported <ber>s), (range of supported <rscp>s),(range of supported <ecno>s), (range of supported<rsrq>s), (range of supported <rsrp>s) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<rxlev>	0-63,99	integer type, received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).
		0 rssi < -110 dBm 1 -110 dBm ≤ rssi < -109 dBm 2 -109 dBm ≤ rssi < -108 dBm : : : : 61 -50 dBm ≤ rssi < -49 dBm 62 -49 dBm ≤ rssi < -48 dBm 63 -48 dBm ≤ rssi 99 not known or not detectable

<ber>	0-7,99	integer type; channel bit error rate (in percent)
		0-7 as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99 not known or not detectable
<rscp>	0-96,255	integer type, received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3).
		0 rscp < -120 dBm 1 -120 dBm ≤ rscp < -119 dBm 2 -119 dBm ≤ rscp < -118 dBm ::: 94 -27 dBm ≤ rscp < -26 dBm 95 -26 dBm ≤ rscp < -25 dBm 96 - 25 dBm ≤ rscp 255 not known or not detectable
<ecno>	0-49,255	integer type, ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause).
		1 -24 dB ≤ Ec/Io < -23.5 dB 2 -23.5 dB ≤ Ec/Io < -23 dB ::: 47 -1 dB ≤ Ec/Io < -0.5 dB 48 -0.5 dB ≤ Ec/Io < 0 dB 49 0 dB ≤ Ec/Io 255 not known or not detectable
<rsrq>	0-34,255	integer type, reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7).
		0 rsrq < -19.5 dB 1 -19.5 dB ≤ rsrq < -19 dB 2 -19 dB ≤ rsrq < -18.5 dB ::: 32 -4 dB ≤ rsrq < -3.5 dB 33 -3.5 dB ≤ rsrq < -3 dB 34 -3 dB ≤ rsrq 255 not known or not detectable
<rsrp>	0-97,255	integer type, reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4).

		0 rsrp < -140 dBm 1 -140 dBm ≤ rsrp < -139 dBm 2 -139 dBm ≤ rsrp < -138 dBm ::: 95 -46 dBm ≤ rsrp < -45 dBm 96 -45 dBm ≤ rsrp < -44 dBm 97 -44 dBm ≤ rsrp 255 not known or not detectable
--	--	--

Example

AT+CESQ

+CESQ:53,99,255,255,34,64

OK

AT+CESQ=?

+CESQ:rsqi:(0-31),ber:(0-7),rscp:(0-96),ecno:(0-49),rsrq:(0-34),rsrp:(1-97)

OK

6.16 AT+CLOCATION Base station positioning

Description

The command is used to obtain the registered base station location.

The necessary condition for using this command is that the module can register and connect to the network.

Syntax

Command	Response
AT+CLOCATION	OK +CLOCATION: <lat_str>,<lng_str>
AT+CLOCATION=?	OK
Maximum Response Time	25s

Defined values

Parameter	values	Explain
-----------	--------	---------

<lat_str>		Latitude
<lng_str>		Longitude

Example

AT+CLOCATION

OK

+CLOCATION: 31.17328200000001,121.59997300001187

Chapter 7. TCP/UDP

7.1 AT+QIPCSGP Set context parameters

Description

Configure the <APN>, <username>, <password> and other contexts by AT+QIPCSGP.

Syntax

Command	Response
AT+QIPCSGP=<CID>,<CONTEXTTYPE>,<APN>,[<username>,<password>]	OK
AT+QIPCSGP?	OK
AT+QIPCSGP=?	+QIPCSGP:(1-6),(1,2),<APN>,<username>,<password>,(0-2) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<CID>	1-6	The context ID. Range: 1-6
<CONTEXTTYPE>	1-3	The protocol type. 1 --- IPv4 2 --- IPv6 3 --- IPv4v6
<APN>		The access point name
<username>		The username. The maximum length: 127 bytes
<password>		The password. The maximum length: 127 bytes.
<authentication>	0-2	The authentication methods. 0 --- None 1 --- PAP 2 --- CHAP

Example

```
AT+QIPCSGP=1,1,"3GNET"
OK
```

7.2 AT+QIPACT Activation context

Description

Before activating context by AT+QIACT, host should configure the context by AT+QICSGP. After activation, the IP address can be queried by AT+QIACT?

Syntax

Command	Response
AT+QIPACT=<contextID>	OK +QIPACTURC: <contextID>,<context_state>,<ip_Addr>
AT+QIPACT?	If it is the default value, it will return: OK If the instruction AT+QIPACT=<contextID> is executed, it will return: +QIPACT:<contextID>,<context_state>,<ip_Addr> OK
AT+QIPACT=?	+QIPACT:(1-6) OK
Maximum Response Time	3s,determined by network

Defined values

Parameter	values	Explain
<contextID>	1-6	The context ID. Range: 1-6.
<CONTEXTTYPE>	0-1	0: Deactivated 1: Activated
"IP"		The local IP address after the context is activated

Example

AT+QIPACT=1

OK

+QIPACTURC: 1,1,"10.76.7.39"

AT+QIPACT?

+QIPACT:1,1,"10.76.7.39"

OK

7.3 AT+QIOPEN Establish a socket connection

Description

Start a socket service by AT+QIOPEN. The service type can be specified by the parameter <service_type>. The data access mode (buffer access mode, direct push access mode and transparent access mode) can be specified by parameter <access_mode>. The URC “+QIOPEN” indicates whether the socket service is started successfully.

Syntax

Command	Response
AT+QIOPEN=<CID>,<socketID>,"<service_type>","<IP_address>",<remote_port>,<local_port>,<access_mode>	OK +QIOPEN: <socketID>,<err>
AT+QIOPEN?	+QIOPEN: <contextID>,<socketID>,<service_type>,<remote_port>,<local_port>,<access_mode> OK
AT+QIOPEN=?	+QIOPEN:(1-6),(1-6),"TCP/UDP/TCP LISTENER/UDP SERVICE","IP_address/domain_name",<remote_port>,<local_port>,(0-2) OK
Maximum Response Time	5s,determined by network

Defined values

Parameter	values	Explain
<contextID>	1-6	The context ID. Range: 1-6.
<socketID>	1-6	The socket ID. Range: 1-6
<service_type>		Socket service type "TCP" Start a TCP connection as a client "UDP" Start a UDP connection as a client Refer to Chapter 8.1 for the relevant configuration of SSL "SSL" Start a SSL TCP connection as a client If <service_type> is "TCP LISTENER" or "UDP SERVICE", please enter 127.0.0.1. "TCP LISTENER" Start a TCP server to listen to TCP connection

		"UDP SERVICE" Start a UDP service
<IP_address>		The domain name or ip address of the remote serve
<remote_port>		The port of the remote server. Range: 0-65535.
<local_port>		The local port. Range: 0-65535.
<access_mode>	0-2	Access mode 0 --- Buffer access mode.Report notification when the news arrives 1 --- Direct push mode.Report the message directly when the message arrives 2 --- Transparent mode
<keepIdle>	0-86400	if <keepIdle> is equal to 0 Disable the KeepAlive funciton else Enable the KeepAlive funciton The time the connection needs to remain idle before TCP starts sending keepalive probes Unit: s, Recommended value 7200
<keepInterval>	0-3600	The number of seconds to wait for a keepalive response before retransmitting the message Unit: s, Recommended value 75
<keepCount>	0-200	he number of retransmission attempts that must occur before the connection is considered dead
<err>		<err> is 0 when the service is opened successfully. Other refer to 7.14 err code

Example

```
AT+QIOPEN=1,1,"TCP","203.156.205.55",8866,12341,1
```

```
OK
```

```
+QIOPEN: 1,0
```

7.4 AT+QIPSTATE Query Socket State

Description

The command used to query socket state.

Syntax

Command	Response
---------	----------

AT+QIPSTATE=<query_type>,<query_index>	+QIPSTATE: <socketID>,<service_type>,<IP_address>,<remote_port>,<local_port>,<socket_state>,<contextID>,<serverID>,<access_mode> OK
AT+QIPSTATE?	+QIPSTATE: <socketID>,<service_type>,<IP_address>,<remote_port>,<local_port>,<socket_state>,<contextID>,<serverID>,<access_mode> OK
AT+QIPSTATE=?	+QIPSTATE:(0-1),(1-6) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<query_type>	0-1	The Query Type. Range: 0-1.
<query_index>	1-6	If <query_type> == 0 The Query Index is context ID, Range: 1-6. If <query_type> == 1 The Query Index is socket ID, Range: 1-6.
<socketID>	1-6	The socket ID. Range: 1-6.
<service_type>		Socket service type "TCP": Start a TCP connection as a client "UDP": Start a UDP connection as a client "SSL": Start a SSL TCP connection as a client If <service_type> is "TCP LISTENER" or "UDP SERVICE", please enter 127.0.0.1.

		"TCP LISTENER": Start a TCP server to listen to TCP connection "UDP SERVICE": Start a UDP service "TCP INCOMING": Accepted socket
<IP_address>		The domain name or ip address of the remote server
<remote_port>		The port of the remote server. Range: 0-65535.
<local_port>		The local port. Range: 0-65535.
<socket_state>	0-4	0: INIT 1: OPENING 2: CONNECTED 3: LISTEN 4: CLOSE
<contextID>	1-6	The context ID. Range: 1-6.
<serverID>	1-6	It only is valid if <service_type> is equal to "TCP INCOMING" The server socketID of accept this socket
<access_mode>	0-2	Access mode 0 --- Buffer access mode. Report notification when the news arrives 1 --- Direct push mode. Report the message directly when the message arrives 2 --- Transparent mode

Example

```
AT+QIOPEN=1,1,"TCP","47.99.180.198",38888,0,1
```

```
OK
```

```
+QIOPEN: 1,0
```

```
AT+QIOPEN=1,2,"SSL","www.baidu.com",443,0,1
```

```
OK
```

```
+QIPOPEN: 2,0

AT+QIPOPEN=2,3,"TCP","47.99.180.198",38888,0,1
OK

+QIPOPEN: 3,0
AT+QIPSTATE=1,2
+QIPSTATE: 2,SSL,112.80.248.75,443,0,2,1,0,1

OK
AT+QIPSTATE=0,1
+QIPSTATE: 1,TCP,47.99.180.198,38888,0,2,1,0,1
+QIPSTATE: 2,SSL,112.80.248.75,443,0,2,1,0,1

OK

AT+QIPSTATE?
+QIPSTATE: 1,TCP,47.99.180.198,38888,0,2,1,0,1
+QIPSTATE: 2,SSL,112.80.248.76,443,0,2,1,0,1
+QIPSTATE: 3,TCP,47.99.180.198,38888,0,2,2,0,1

OK
```

7.5 AT+QIPSEND Send data

Description

The command used to send data.

Syntax

Command	Response
AT+QIPSEND=<socketID>[,<sendLen>]	> +QIPSEND:<socketID>,<length> OK OR ERROR
AT+QIPSEND?	OK

AT+QIPSEND=?	AT+QIPSEND=? +QIPSEND:(1-6),(0-1460) OK
Maximum Response Time	10s

Defined values

Parameter	values	Explain
<socketID>	1-6	The socket ID. Range: 1-6.
<sendLen>	0-1460	The length of data to be sent, which cannot exceed 1460 bytes.
<length>		Length of successful send

Example

AT+QIPSEND=1

>1234567890<CTRL+Z>

+QIPSEND:1,10

OK

AT+QIPSEND=1,10

>AAAAAAAAAAAA

+QIPSEND:1,10

OK

7.6 AT+QIPSENDEX Send Hex String Data

Description

The command used to send hex string data.

Syntax

Command	Response
AT+QIPSENDEX=<socketID> >,<hex_string>	+QIPSENDEX:<socketID>,<length> OK OR

	ERROR
AT+QIPSENDEX?	OK
AT+QIPSENDEX=?	AT+QIPSENDEX=? +QIPSEND:(1-6),<hex_string> OK
Maximum Response Time	3s

Defined values

Parameter	values	Explain
<socketID>	1-6	The socket ID. Range: 1-6 .
<hex_string>		The hex string data, Max 1460 bytes .
<length>		Length of successful send

Example

AT+QIPSENDEX=1,"3132333435"

+QIPSENDEX:1,5

OK

7.7 AT+QIPREAD Read data

Description

In buffer access mode, after receiving data, the module will buffer it and report a URC as +QIPREADURC: <socketID> to notify the host. Then host can retrieve data by AT+QIPREAD

Syntax

Command	Response
AT+QIPREAD=<socketID>	+QIPREAD: <length> OK
AT+QIPREAD=<socketID>,<length>	+QIPREAD: <socketID>,<length> data OK
AT+QIPREAD?	OK
AT+QIPREAD=?	+QIPREAD:(0--6),(0-1500)

	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<socketID>	1-6	The socket ID. Range: 1-6.
<length>	0-1500	The maximum length of data to be read. Range: 0-1500

Example

```
+QIPREADURC: 2
```

```
AT+QIPREAD=2
```

```
+QIPREAD: 10
```

```
OK
```

```
AT+QIPREAD=2,10
```

```
+QIPREAD: 2,10
```

```
#####
```

```
OK
```

7.8 AT+QIPCLOSE Close the socket connection

Description

The command use to be close the socket connection.

Syntax

Command	Response
AT+QIPCLOSE=<socketID>	+QIPCLOSE: <socketID> OK
AT+QIPCLOSE?	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<socketID>	1-6	The socket ID. Range: 1-6.

Example

```
AT+QIPCLOSE=1
```

```
+QIPCLOSE: 1
```

```
OK
```

7.9 AT+QIPDEACT Disconnect TCP/IP connection

Description

The command will deactivate the specific context <context ID> and close a TCP/IP connections set up in this context.

Syntax

Command	Response
AT+QIPDEACT=<contextID>	OK
AT+QIPDEACT?	OK
AT+QIPDEACT=?	+QIPDEACT:(1-6) OK
Maximum Response Time	10s,determined by network

Defined values

Parameter	values	Explain
<contextID>	1-6	The context ID. Range: 1-6.

Example

```
AT+QIPDEACT=1
```

```
OK
```

7.10 AT+QUARTIPOPEN Serial port transparent setting

Description

This command is used to set the serial port transparent transmission parameters. It takes effect after restart. After setting the wrong parameters, the device will not enter the transparent transmission mode next time.

Syntax

Command	Response
AT+QUARTIPOPEN=<contextID>,<so>	OK

cketID>,"<service_type>","<IP_address>","<remote_port>,<local_port>,<access_mode>	
AT+QUARTIPOPEN?	+QUARTIPOPEN: <contextID>,<socketID>,"<service_type>","<IP_address>","<remote_port>,<local_port>,<access_mode> OK
AT+QUARTIPOPEN=?	+QUARTIPOPEN:(0-6),(1-6),"TCP/UDP/TCP LISTENER/UDP SERVICE","IP_address/domain_name",<remote_port>,<local_port>,(0-2) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<contextID>	1-6	The context ID. Range: 1-6.
<socketID>	1-6	The socket ID. Range: 1-6.
<service_type>		Socket service type "TCP" Start a TCP connection as a client "UDP" Start a UDP connection as a client
<IP_address>		The domain name or ip address of the remote server
<remote_port>	0-65535	The port of the remote server. Range: 0-65535.
<local_port>	0-65535	The local port. Range: 0-65535.
<access_mode>	2	Access mode 2 --- Transparent mode(Only mode 2 works)
<keepIdle>	0-86400	if <keepIdle> is equal to 0 Disable the KeepAlive function else Enable the KeepAlive function The time the connection needs to remain idle before TCP starts sending keepalive probes Unit: s, Recommended value 7200
<keepInterval>	0-3600	The number of seconds to wait for a keepalive response before retransmitting the message Unit: s, Recommended value 75
<keepCount>	0-200	The number of retransmission attempts that must occur before the connection is considered dead

Example

AT+QUARTIPOPEN=1,1,"TCP","203.156.205.55",9568,12341,2

OK //Enter the serial port transparent transmission mode after restart

AT+QUARTIPOPEN=0,0,"TCP","203.156.205.55",9568,12341,2

OK //Invalid parameter, will not enter serial port transparent transmission mode after restart

7.11 AT+QIPSWTMD Switch Socket Access Mode

Description

The command used to switch socket access mode.

Syntax

Command	Response
AT+QIPSWTMD=<socketID>,<access_mode>	If switch to Buffer access mode or Direct push mode. OK If switch to Transparent mode. CONNECT If socket not open or failed. ERROR
AT+QIPSWTMD?	OK
AT+QIPSWTMD=?	+QIPSWTMD:(1-6),(0-2) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<socketID>	1-6	The socket ID. Range: 1-6.
<access_mode>	0-2	Access mode 0 --- Buffer access mode.Report notification when the news arrives 1 --- Direct push mode.Report the message directly when the message arrives 2 --- Transparent mode

Example

AT+QIPCSGP=1,1,"CMNET"

OK

AT+QIPACT=1

OK

+QIPACTURC: 1,1,"10.227.82.181"

AT+QIPOPEN=1,1,"TCP","47.99.180.198",38888,0,1

OK

+QIPOPEN: 1,0

AT+QIPSWTMD=1,2

CONNECT

11111

OK

// entern +++ to eixt Transparent mode

ATO

CONNECT

OK

// if not switch the access mode, can use "ATO" return to the Transparent mode

// To prevent data loss after eixt Transparent mode, better to switch to Buffer access mode or Direct push mode at once

// entern +++ to eixt Transparent mode

AT+QIPSWTMD=1,1

OK

RECV FROM:1,47.99.180.198,38888,12
222222222222

ATO

NO CARRIER

// If switch to other access mode,can not use "ATO" return to Transparent mode.
"AT+QIPSWTMD=1,2" can return to Transparent mode

7.12 TCPIP URCs

Description

Description of URCs

Syntax

Command	Response
+QIPACTURC	+QIPACTURC: <CID>,<CONTEXTTYPE>,<IP>
+QIPOPEN	+QIPOPEN: <socketID>,<err>
+QIPREADURC	+QIPREADURC: <socketID>
+QIPURCCLIENT	+QIPURCCLIENT: <socketID>,<IP>,<PORT>

7.13 TCP/UDP Example

Single APN	
→	AT+QIPCSGP=1,1,"3GNET"
←	OK
→	AT+QIPACT=1
←	OK
←	+QIPACTURC: 1,1,"10.189.42.254"
→	AT+QIPOPEN=1,1,"TCP","47.99.180.198",38888,0,1
←	OK

←	+QIPOPEN: 1,0
→	AT+QIPOPEN=1,2,"TCP","47.99.180.198",38888,0,0
←	OK
←	+QIPOPEN: 2,0
→	AT+QIPSEND=1
←	>#recv ">" then input data, Ctrl+Z(0x1A) Terminate input and send
←	+QIPSEND:1,9
←	OK
←	RECV FROM:1,47.99.180.198,38888,18 111111111111111111
←	+QIPREADURC: 2
→	AT+QIPREAD=2,1500
←	+QIPREAD: 2,16
←	2222222222222222
←	OK
→	AT+QIPCLOSE=1
←	+QIPCLOSE: 1
←	OK
→	AT+QIPCLOSE=2
←	+QIPCLOSE: 2
←	OK
Multi APN Suitable for sending data to both public and private networks	
→	AT+QIPCSGP=1,1,"3GNET"

←	OK
→	AT+QIPCSGP=2,1,"UNINET"
←	OK
→	AT+QIPACT=1
←	OK
←	+QIPACTURC: 1,1,"10.189.42.254"
→	AT+QIPACT=2
←	OK
←	+QIPACTURC: 2,1,"10.57.93.70"
→	AT+QIPOPEN=1,1,"TCP","47.99.180.198",38888,0,1
←	OK
←	+QIPOPEN: 1,0
→	AT+QIPOPEN=2,3,"SSL","www.baidu.com",443,0,1
←	OK
←	+QIPOPEN: 3,0
→	AT+QIPSEND=1
←	>#recv ">" then input data, Ctrl+Z(0x1A) Terminate input and send
←	+QIPSEND:1,9
←	OK
←	RCV FROM:1,47.99.180.198,38888,18 111111111111111111
→	AT+QIPSENDEX=3,"31320D0A"
←	+QIPSENDEX:3,4
←	OK

←	RCV FROM:3,112.80.248.75,443,28 HTTP/1.1 400 Bad Request
←	+QIPCLOSEURC: 3

7.14 err code

err code	Description
0	SUCCESS
550	UNKNOWN
551	OPERATION_BLOCKED
552	INVALID_PARAMETERS
553	MEMORY_NOT_ENOUGH
554	CREATE_SOCKET_FAILED
555	OPERATION_NOT_SUPPORTED
556	SOCKET_BIND_FAILED
557	SOCKET_LISTEN_FAILED
558	SOCKET_WRITE_FAILED
559	SOCKET_READ_FAILED
560	SOCKET_ACCEPT_FAILED
561	OPEN_PDP_CONTEXT_FAILED
562	CLOSE_PDP_CONTEXT_FAILED
563	SOCKET_IDENTITY_HAS_BEEN_USED
564	DNS_BUSY
565	DNS_PARSE_FAILED
566	SOCKET_CONNECT_FAILED
567	SOCKET_HAS_BEEN_CLOSED
568	OPERATION_BUSY
569	OPERATION_TIMEOUT
570	PDP_CONTEXT_BROKEN_DOWN
571	CANCEL_SEND
572	OPERATION_NOT_ALLOWED

573	APN_NOT_CONFIGURED
574	PORT_BUSY

Chapter 8. FTP

8.1 AT+QFTPCFG Configure Parameters for FTP(S) Server

Description

The command is used to configure FTP(S) server, user account, file type, transfer mode and context ID. If the Write Command only executes one parameter, it will query the current settings.

Syntax

Command	Response
AT+QFTPCFG=?	+QFTPCFG: "account",<username>,<password> +QFTPCFG: "filetype",(0,1) +QFTPCFG: "transmode",(0,1) +QFTPCFG: "contextid",(1,16) +QFTPCFG: "rsptimeout",(20-180) +QFTPCFG: "ssltype",(0,1) +QFTPCFG: "sslctxid",(0,1) OK
AT+QFTPCFG="account"[,<username>,<password>]	If <username> and <password> are not omitted: OK or +CME ERROR:<err> If <username> and <password> are both omitted, query the current settings: +QFTPCFG: "account",<username>,<password> OK
AT+QFTPCFG="filetype"[,<file_type>]	If <file_type> is not omitted: OK Or +CME ERROR:<err> If <file_type> is omitted, query the current settings: +QFTPCFG: "filetype",<file_type> OK
AT+QFTPCFG="transmode"[,<transmode>]	If <transmode> is not omitted: OK Or +CME ERROR: <err> If <transmode> is omitted, query the current settings: +QFTPCFG: "transmode",<transmode>

	OK
AT+QFTPCFG="contextid"[,<contextID>]	If <contextID> is not omitted: OK Or +CME ERROR: <err> If <contextID> is omitted, query the current settings: +QFTPCFG: "contextid",<contextID> OK
AT+QFTPCFG="rsptimeout"[,<timeout>]	If <timeout> is not omitted: OK Or +CME ERROR: <err> If <timeout> is omitted, query the current settings: +QFTPCFG: "rsptimeout",<timeout> OK
AT+QFTPCFG="ssltype"[,<ssltype>]	If <ssltype> is not omitted: OK Or +CME ERROR: <err> If <ssltype> is omitted, query the current settings: +QFTPCFG: "ssltype",<ssltype> OK
AT+QFTPCFG="sslctxid"[,<sslctxid>]	If <sslctxid> is not omitted: OK Or +CME ERROR: <err> If <sslctxid> is omitted, query the current settings: +QFTPCFG: "sslctxid",<sslctxid> OK
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<username>		String type. The user name for authentication. The maximum size of the parameter is 255 bytes.
<password>		String type. The password for authentication. The maximum size of the parameter is 255 bytes.

<contextID>	1-16	Integer type. The PDP context ID. The range is 1-16, and the default value is 1. It should be activated by AT+QIACT before using QFTPOPEN.
<file_type>	0-1	Integer type. The type of transferred data. 0---Binary type 1---ASCII type
<transmode>	0-1	Integer type. Whether the FTP(S) server or client listens on a port for data connection. 0--- Active mode, the module will listen on a port for data connection 1--- Passive mode, FTP(S) server will listen on a port for data connection
<timeout>	20-180	Integer type. The range is 20-180, and the default value is 90. Unit: second. Generally, it is the timeout value for most +QFTPXXX: xx,xx commands after the “OK” result code is returned, except AT+QFTPPUT/QFTPGET/QFTPLST/QFTPNLST commands. The rules for these four commands are shown as below: a) When the command has been sent, but “CONNECT” has not been outputted yet, this parameter indicates the maximum interval time for “CONNECT” to be outputted after the command has been sent. b) When the module has entered into data mode, this parameter indicates the maximum interval time between two packets of received/transmitted data. c) When the <local_name> is not “COM:”, it indicates the maximum interval time between two packets of received/transmitted data.
<ssltype>	0-1	Integer type. The module works as FTP client or FTPS client. 0--- FTP client 1---FTPS client
<sslctxid>	0-5	Integer type. The SSL context ID. The range is 0-5, and the default value is 0. Customers should configure the SSL parameters by AT+QSSLCFG.
<err>		Integer type. The error code of the operation.

NOTE:

During FTPS operation, <transmode> must be set into 1 because FTPS does not support active mode currently.

Example

```
AT+QFTPCFG="XX","XX","XX"
```

```
OK
```

8.2 AT+QFTPOPEN Login to FTP(s) Server

Description

The command is used to login to FTP(S) server. The PDP context should be activated by AT+QIACT first. “+QFTPOPEN: <err>,<protocol_error>” indicates the operation result of AT+QFTPOPEN and it should be outputted within <timeout> configured by AT+QFTPCFG.

Syntax

Command	Response
AT+QFTPOPEN=?	+QFTPOPEN= <hostname>,<port> OK
AT+QFTPOPEN=<hostname> [,<port>]	+QFTPOPEN: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<hostname>		String type. The IP address or domain name of the FTP(S) server. The maximum size of the parameter is 200 bytes.
<port>	21	Integer type. The port of the FTP(S) server. The default value is 21.
<err>		Integer type. The error code of the operation.
<protocol_error>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

NOTE:

Please note that the ports of FTPS and FTP server are different. The port of FTPS server depends on FTPS server provider, and it is 990 usually.

Example

```
AT+QFTPOPEN="XX.XX.XX.XX",21
+QFTPOPEN: 0,230
OK
```

8.3 AT+QFTPCWD Configure the Current Directory on FTP(S) Server

Description

The command is used to configure the current directory on FTP(S) server. If “OK” is returned, “+QFTPCWD: <err>,<protocol_error>” should be outputted within <timeout> configured by AT+QFTPCFG. All the files and directory operation will be configured in the current directory.

Syntax

Command	Response
AT+QFTPCWD=?	+QFTPCWD: <path_name> OK
AT+QFTPCWD=<path_name>	OK +QFTPCWD: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<path_name>		String type. A directory path on FTP(S) server. The maximum size of the parameter is 255 bytes. The root path of FTP(S) server is “/” .
<err>		Integer type. The error code of the operation.
<protocol_err>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

Example

AT+QFTPCWD=?

+QFTPCWD: <pathname>

OK

AT+QFTPCWD="/"

+QFTPCWD: 0,250

OK

8.4 AT+QFTPPWD Get the Current Directory on FTP(S) Server

Description

The command is used to get the current directory on FTP(S) server. If “OK” is returned, “+QFTPPWD: 0,<path_name>” or “+QFTPPWD: <err>,<protocol_error>” should be outputted within <timeout> configured by AT+QFTPCFG.

Syntax

Command	Response
AT+QFTPPWD=?	+QFTPPWD: OK
AT+QFTPPWD	OK If successfully got, response: +QFTPPWD: 0,<path_name> If failed to get, response: +QFTPPWD: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<path_name>		String type. A directory path on FTP(S) server. The maximum size of the parameter is 255 bytes. The root path of FTP(S) server is “/” .
<err>		Integer type. The error code of the operation.
<protocol_error>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

Example

AT+QFTPPWD

+QFTPPWD

OK

8.5 AT+QFTPSIZE Get the File Size on FTP(S) Server

Description

The command is used to get the file size on FTP(S) server. If “OK” is returned, “+QFTPSIZE: 0,<file_size>” or “+QFTPSIZE: <err>,<protocol_error>” should be outputted within <timeout> configured by AT+QFTPCFG. Otherwise, the FTP(S) connection should be disconnected, and the network should be deactivated and reactivated.

Syntax

Command	Response
AT+QFTPSIZE=?	+QFTPSIZE: <filename> OK
AT+QFTPSIZE=<file_name>	OK If successfully got, response: +QFTPSIZE: 0,<file_size> If failed to get, response: +QFTPSIZE: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<filename>		String type. The file name on FTP(S) server. The maximum size of the parameter is 255 bytes.
<file_size>		Integer type. The size of file on FTP(S) server. Unit: byte.
<err>		Integer type. The error code of the operation.
<protocol_error>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

Example

```
AT+QFTPSIZE=?
+QFTPSIZE: <filename>

OK
AT+QFTPSIZE="123.txt"
+QFTPSIZE: 0,105

OK
```

8.6 AT+QFTPGET Download a File from FTP(S) Server

Description

The command is used to download a file from FTP(S) server. The file can be outputted via COM port by AT+QFTPGET="filename","COM:". The module will enter into data mode on receiving data from server. After the data is transferred completely, the module will exit from data mode automatically and output “QFTPGET: 0,<transferlen>”. The file can be saved to RAM, UFS or SD by AT+QFTPGET="filename","RAM:localname", AT+QFTPGET="filename","UFS:localname" or AT+QFTPGET="filename","SD:localname". After the file has been transferred completely, the module will output “+QFTPGET: 0,<transferlen>”.

If the <local_name> is “COM:”, “CONNECT” should be outputted within <timeout> configured by AT+QFTPCFG. If the <local_name> is not “COM:”, “OK” will be outputted first, and then “+QFTPGET: 0,<transferlen>” will be outputted after data has been transferred completely.

If the module has entered into data mode or the <local_name> is not “COM:”, the <timeout> configured by AT+QFTPCFG indicates the maximum interval time between two packets of received/transmitted data.

Syntax

Command	Response
AT+QFTPGET=?	+QFTPGET: <file_name>,<local_name>,<startpos>,<downloadlen> OK
AT+QFTPGET=<file_name>,"COM:"[,<startpos>[,<downloadlen>]]	CONNECT <Output file data> OK If successfully downloaded, response: +QFTPGET: 0,<transferlen> If failed to download, response: +QFTPGET: <err>,<protocol_error> Or +CME ERROR: <err>
AT+QFTPGET=<file_name>,<local_name>[,<startpos>]	OK If successfully downloaded, response:

<local_name> is not "COM:"	+QFTPGET: 0,<transferlen> If failed to download, response: +QFTPGET: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<file_name>		String type. The file name on FTP(S) server. The maximum size of the parameter is 255 bytes
<local_name>		String type. The local file name. The maximum size of the parameter is 60 bytes. If it is "COM:", the file data will be outputted via COM port. If it is not "COM:", the data will be saved to RAM, UFS or SD. It is strongly recommended to save the file in RAM, UFS or SD.
<startpos>		Integer type. The start position of the file to be downloaded. The default value is 0.
<downloadlen>		Integer type, the length of data to be downloaded. It is valid only if <local_name> is "COM:". If this parameter is specified, the module will output <downloadlen> bytes to COM port and exit from data mode. And data can be downloaded from <startpos> by the same AT command if there is any data left. Unit: byte.
<transferlen>		Integer type. The length of actually transferred data. If it is less than <downloadlen>, it means the whole file is transferred completely. Unit: byte.
<err>		Integer type. The error code of the operation.
<protocol_error>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

Example

```
AT+QFTPGET="123.txt","dst.txt"
```

```
OK
```

```
+QFTPURC: 1 // +QFTPURC: status /*0: FTP command close, 1: FTP data close*/
```

```
+QFTPGET: 0,105
```

8.7 AT+QFTPCLOSE Log out from FTP(S) Server

Description

The command is used to log out from FTP(S) server. If “OK” is returned, “+QFTPCLOSE: <err>,<protocol_error>” should be outputted within <timeout> configured by AT+QFTPCFG. Otherwise, the network should be deactivated and reactivated.

Syntax

Command	Response
AT+QFTPCLOSE=?	+QFTPCLOSE: OK
AT+QFTPCLOSE	OK +QFTPCLOSE: <err>,<protocol_error> Or +CME ERROR: <err>
Maximum Response Time	36s

Defined values

Parameter	values	Explain
<err>		Integer type. The error code of the operation.
<protocol_error>		Integer type. For reference only. Indicates the original error code from FTP(S) server which is defined in FTP(S) protocol.

Example

```

AT+QFTPCLOSE
+QFTPCLOSE: 0,0

OK

+QFTPCUR: 0
    
```

Chapter 9. SSL (for cat1 modules)

9.1 AT+SSLCFG configure SSL config

Description

The command is used to configure the ssl config.

Syntax

Command	AT+SSLCFG=?
Response	+SSLCFG:(params_name),(sslctxID),[value] OK
Command	AT+SSLCFG="sslversion",<sslctxID>[,<sslversion>]
Response	If <sslversion> is omitted, query the value of "sslversion" with specified <sslctxID>, and response: +SSLCFG: "sslversion",<sslctxID>,<sslversion> Else, set the value of "version" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="ciphersuite",<sslctxID>[,<ciphersuites>]
Response	If <ciphersuites> is omitted, query the value of "ciphersuite" with specified <sslctxID>, and response: +SSLCFG: "ciphersuite",<sslctxID>,<ciphersuites> Else, set the value of "ciphersuite" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="cacert",<sslctxID>[,<cacertpath>]
Response	If <cacertpath> is omitted, query the value of "cacert" with specified <sslctxID>, and response: +SSLCFG: "cacert",<sslctxID>,<cacertpath> Else, set the value of "cacert" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="clientcert",<sslctxID>[,<client_cer_tpath>]
Response	If <client_cert_path> is omitted, query the value of "clientcert" with specified <sslctxID>, and response: +SSLCFG: "clientcert",<sslctxID>,<client_cert_path> Else, set the value of "clientcert" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="clientkey",<sslctxID>[,<client_key_path>]
Response	If <client_key_path> is omitted, query the value of "clientkey" with

	specified <sslctxID>, and response: +SSLCFG: "clientkey",<sslctxID>,<client_key_path> Else, set the value of "clientkey" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="secllevel",<sslctxID>[,<secllevel>]
Response	If <secllevel> is omitted, query the value of "secllevel" with specified <sslctxID>, and response: +SSLCFG: "secllevel",<sslctxID>,<secllevel> Else, set the value of "clientkey" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="ignorelocaltime",<sslctxID>[,<ignoreltime>]
Response	If <ignoreltime> is omitted, query the value of "ignorelocaltime" with specified <sslctxID>, and response: +SSLCFG: "ignorelocaltime",<sslctxID>,<ignoreltime> Else, set the value of "ignorelocaltime" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="negotiatetime",<sslctxID>[,<negotiate_time>]
Response	If <negotiate_time> is omitted, query the value of "negotiatetimeout" with specified <sslctxID>, and response: +SSLCFG: "negotiatetimeout",<sslctxID>,<negotiate_time> Else, set the value of "negotiatetimeout" with specified <sslctxID>, and response: OK or ERROR
Command	AT+SSLCFG="hostname",<sslctxID>[,<hostname>]
Response	If <hostname> is omitted, query the value of "hostname" with specified <sslctxID>, and response: +SSLCFG: "hostname",<sslctxID>,<hostname> Else, set the value of "hostname" with specified <sslctxID>, and response: OK or ERROR

Defined values

Parameter	values	Explain
<sslctxID>	1-6	For TCP SSL <sslctxID> is bound to <socketID> of "+QIOPEN"

	88,153	For MQTT SSL <sslctxID> :88 For HTTP SSL <sslctxID> :153
	0-4	Numeric type, SSL Version 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 4: All
	0 1	Numeric type, SSL Ciphersuites 0x0035 TLS_RSA_WITH_AES_256_CBC_SHA 0x002F TLS_RSA_WITH_AES_128_CBC_SHA 0x0005 TLS_RSA_WITH_RC4_128_SHA 0x0004 TLS_RSA_WITH_RC4_128_MD5 0x000A TLS_RSA_WITH_3DES_EDE_CBC_SHA 0x003D TLS_RSA_WITH_AES_256_CBC_SHA256 0xFFFF Support all
<ignoreltime>		Numeric format, indicates how to deal with expired certificate 0: Care about time check for certification 1: Ignore time check for certification
<cacertpath>		String format The path of the trusted CA certificate.
<client_cert_path>		String format The path of the client certificate.
<client_key_path>		String format The path of the client private key.
<secllevel>	0-1	Numeric format, the authentication mode 0: No authentication 1: Manage server authentication
<negotiate_time>	10-300	Numeric format, indicates max timeout used in SSL negotiate stage, value Rang is 10-300, unit: seconds, default: 300.

Example

TCP SSL Example

AT+QIPCSGP=1,1,"3GNET"

OK

AT+QIPACT=1

OK

+QIPACTURC: 1,1,"10.189.42.254"

```
AT+SSLCFG="hostname",1,"fanyi.baidu.com" // SSL sslctxID is 1
```

OK

```
AT+SSLCFG="hostname",1
```

```
+SSLCFG:"hostname",1,fanyi.baidu.com
```

OK

```
AT+QIOPEN=1,1,"SSL","fanyi.baidu.com",443,0,1 // tcp socketID is bound to ssl  
sslctxCID
```

OK

```
+QIOPEN: 1,0
```

```
AT+QIPSEND=1,112
```

```
>POST https://fanyi.baidu.com HTTP/1.1
```

```
Host: fanyi.baidu.com
```

```
Content-Type: text/html
```

```
Content-Length: 4
```

```
中国
```

```
+QIPSEND:1,112
```

OK

```
RECV FROM:1,112.80.255.4,443,1429
```

```
HTTP/1.1 200 OK
```

```
Content-Type: text/html; charset=utf-8
```

```
Date: Mon, 01 Feb 2021 06:23:52 GMT
```

```
P3p: CP=" OTI DSP COR IVA OUR IND COM "
```

```
Server: Apache
```

```
Set-Cookie: BAIDUID=919C87361757EB85C456978E51B730D6:FG=1; expires=Tue,  
01-Feb-22 06:23:52 GMT; max-age=31536000; path=/; domain=.baidu.com; version=1
```

```
Tracecode: 14323008982697339658020114
```


Vary: Accept-Encoding

Transfer-Encoding: chunked

.....

Chapter 10. SMS

10.1 AT+CSMS Select Message Service

Description

The command is used to select messaging service <service>.

Syntax

Command	Response
AT+CSMS=<service>	+CSMS:<mt>,<mo>,<bm> OK
AT+CSMS?	+CSMS:<sevice>,<mt>,<mo>,<bm> OK
AT+CSMS=?	+CSMS:(<service>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<service>	0	SMS at command is compatible with GSM phase 2.
	1	SMS at command is compatible with GSM phase 2+.
<mt>	0	Mobile terminated messages is not supported.
	1	Mobile terminated messages is supported.
<mo>	0	Mobile originated messages is not supported.
	1	Mobile originated messages is supported.
<bm>	0	Broadcast type messages is not supported.
	1	Broadcast type messages is supported.

Example

AT+CSMS=?

+CSMS: (0,1)

OK

AT+CSMS?

+CSMS: 0,1,1,1

OK

10.2 AT+CPMS Preferred Message Storage

Description

The command is used to select memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.

Syntax

Command	Response
AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	+CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK
AT+CPMS?	+CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK
AT+CPMS=?	+CPMS:(<mem1>list),(<mem2>list),(<mem3>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mem1>	“SM”	SIM message storage,memory from which messages are read and deleted
	“ME”or“MT”	FLASH message storage,memory from which messages are read and deleted
	“SR”	Status report storage,memory from which messages are read and deleted
<mem2>	“SM”	SIM message storage,memory to which writing and sending operations are made
	“ME”or“MT”	FLASH message storage,memory to which writing and sending operations are made
	“SR”	Status report storage,memory to which writing and sending operations are made
<mem3>	“SM”	SIM message storage,memory to which received SMS is preferred to be stored
	“ME”	FLASH message storage,memory to which received SMS is preferred to be stored
<usedx>		Number of messages currently in <memX>.

<totalx>		Total number of message locations in <memX>.
----------	--	--

Example

AT+CPMS?

+CPMS: "SM",1,40,"SM",1,40,"SM",1,40

OK

AT+CPMS="ME","ME","ME"

+CPMS: 0,180,0,180,0,180

OK

10.3 AT+CMGF Select Short Message Format

Description

The command is used to specify the input and output format of the short messages.

Syntax

Command	Response
AT+CMGF[=<mode>]	OK
AT+CMGF?	+CMGF: <mode> OK
AT+CMGF=?	+CMGF: (<mode>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0	PDU mode (default when implemented)
	1	Text mode

Example

AT+CMGF=?

+CMGF: (0-1)

OK

AT+CMGF=1

OK

10.4 AT+CSCA SMS Service Center Address

Description

This command write command updates the SMSC address when mobile originated SMS are transmitted. In text mode, the setting is used by write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address is coded into the <pdu> parameter which equals to zero

Syntax

Command	Response
AT+CSCA=<sca>[,<tosca>]	OK
AT+CSCA?	+CSCA:<sca>,<tosca> OK
AT+CSCA=?	OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<sca>		Service center address.
<tosca>		Type of service center address.

Example

AT+CSCA="+8613010314500"

OK

AT+CSCA?

+CSCA: "+8613010314500",145

OK

10.5 AT+CNMI New Message Indications to TE

Description

The command is used to select 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.

Syntax

Command	Response
AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]	OK
AT+CNMI?	+CNMI:<mode>,<mt>,<bm>,<ds>,<bfr> OK
AT+CNMI=?	+CNMI:(<mode>list),(<mt>list),(<bm>list),(<ds>list),(<bfr>list) OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<mode>	0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
	1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.
	2	Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE
<mt>	0	No SMS-DELIVER indications are routed to the TE.
	1	If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem3>,<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>,<dcsc>,<sca>,<tosca>,<length>] <CR> <LF><data>
	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>	0	No CBM indications are routed to the TE.
	2	New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dcsc>,<page>,<pages><CR><LF><data> (text mode enabled)
<ds>	0	No SMS-STATUS-REPORTs are routed to the TE.
	1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +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: <mem3>,<index>.
<bfr>	0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 to 3 is entered
	1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1 to 3 is entered.

Example

AT+CNMI=1,1

OK

```
+CMTI: "SM",20 //short message is coming
```

10.6 AT+CMGW Write Message to Memory

Description

AT+CMGW write and execution commands store a short message from TE to memory storage <mem2>. Memory location <index> of the stored message is returned.

Syntax

Command	Response
AT+CMGW=<da>[,<toda>[,<stat>]] text to send <ctrl-Z/ESC> (TEXT mode)	+CMGW: <index> OK
AT+CMGW=<length>[,<stat>] PDU to send <ctrl-Z/ESC> (PDU mode)	+CMGW: <index> OK
AT+CMGW=?	OK
Maximum Response Time	300ms

Defined values

Parameter	values		Explain
<da>			Destination-Address.
<toda>			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).
<stat>	text	“REC UNREAD”	Received unread messages
		“REC READ”	Received read messages
		“STO UNSENT”	Stored unsent messages
		“STO SENT”	Stored sent messages
		“ALL”	All messages
	PDU	0	Received unread messages
		1	Received read messages
		2	Stored unsent messages
		3	Stored sent messages
		4	All messages

Example


```

AT+CMGF=1
OK
AT+CMGW="1381627xxxx"
> TEST
+CMGW: 1

OK
AT+CMGF=0
OK
AT+CMGW=20
> 0011000D9168311826x7xxFx0000AA05D4E2941A03
+CMGW: 2

OK
    
```

10.7 AT+CMSS Send Message From Storage

Description

The command is used to send message with location value <index> from preferred message storage to the network.

Syntax

Command	Response	
AT+CMSS=<index>[,<da>[,<tda>]]	text	+CMSS:<mr> OK
	PUD	+CMSS:<mr>[,<ackpdu>] OK
Maximum Response Time		120s,determined by network

Defined values

Parameter	values	Explain
<index>		Value in the range of location numbers supported by the associated memory and start with zero.
<da>		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 <tda>.
<tda>		Type of recipient address.
<mr>		Message reference.
<scts>		Service center time stamp.
<ackpdu>		Format is same for <pdu> in case of SMS, but without 3GPP TS 24.011 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter.

Example

```
AT+CMGF=1
```

```
OK
```

```
AT+CMSS=8
```

```
+CMSS: 32
```

```
OK
```

```
AT+CMGF=0
```

```
OK
```

```
AT+CMSS=9
```

```
+CMSS: 33
```

```
OK
```

10.8 AT+CMGS Send Message**Description**

AT+CMGS write command sends a short message from TE to network (SMS- After invoking the write command, wait for the prompt ">" and then start to write the message. Then enter <CTRL-Z> to indicate the ending of PDU and begin to send the message. Sending can be cancelled by giving <ESC> character. Abortion is acknowledged with "OK", though the message will not be sent. The message reference <mr> is returned to the TE on successful message delivery. The value can be used to identify message upon unsolicited delivery status report result code.

Syntax

Command	Response
AT+CMGS=<da>[,<toda>] text to send <ctrl-Z/ESC> (TEXT mode)	+CMGS: <mr> OK
AT+CMGS=<length> PDU to send <ctrl-Z/ESC> (PDU mode)	+CMGS: <mr> OK
Maximum Response Time	120s,determined by network

Defined values

Parameter	values	Explain
<da>		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>		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).
<length>		Message length.
<mr>		Message reference.

Example

```

AT+CMGF=1      //TEXT mode
OK
AT+CMGS="1381627XXXX"
> TEST
+CMGS: 34

OK
AT+CMGF=0      //PDU mode
OK
AT+CMGS=20
> 0011000D9168311826X7XXFX0000AA05D4E2941A03
+CMGS: 35

OK

```

10.9 AT+CMGL List Messages

Description

Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE.

Test command shall give a list of all status values supported by the TA.

Syntax

Command		Response
AT+CMGL[=<stat>]	PDU	+CMGL: <index>,<stat>,[<alpha>],<length> <CR><LF><PDU> OK
	text	+CMGL: <index>,<stat>,<da>/<oa>,[<alpha>],[<scts>] [,<tooa>/<toda>,<length>]<CR><LF><data>[...] OK
AT+CMGL=?		+CMGL: (<stat>list) OK
Maximum Response Time		300ms

Defined values

Parameter	values		Explain
<index>			Value in the range of location numbers supported by the associated memory and start with zero.
<stat>	text	“REC UNREAD”	Received unread messages
		“REC READ”	Received read messages
		“STO UNSENT”	Stored unsent messages
		“STO SENT”	Stored sent messages
		“ALL”	All messages
	PDU	0	Received unread messages
		1	Received read messages
		2	Stored unsent messages
		3	Stored sent messages
		4	All messages

<alpha>		String type 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 AT+CSCS .
<length>		Message length.
<da>		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 <toa>.
<oa>		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 <toa>.
<scts>		Service center time stamp.
<toa>		Type of originating address.
<toa>		Type of recipient address.

Example

```

AT+CMGF=1    //TEXT mode
OK
AT+CMGL="ALL"
+CMGL: 1,"STO UNSENT","13816278107"
TESTE1

+CMGL: 2,"STO SENT","13816278107"
TEST2

+CMGL: 3,"REC READ","15618593215",,"19:11:1215:54:10 GMT+8"

```

TEST3

+CMGL: 4,"REC UNREAD","15618593215",,"19:11:1215:55:12 GMT+8"

TEST4

OK

AT+CMGF=0 //PDU mode

AT+CMGL=4

+CMGL: 1,2,,19

010021000B813118268701F7000006D4E2945A8C01

+CMGL: 2,3,,18

010021000B813118268701F7000005D4E2942A03

+CMGL: 3,1,,24

0891683108200115F2240BA15116583912F500009111215145012305D4E2943A03

+CMGL: 4,1,,24

0891683108200115F2240BA15116583912F500009111215155212305D4E2944A03

OK

10.10 AT+CMGR Read Message

Description

The command returns message with location value <index> from message storage <mem1> to the TE.

Syntax

Command		Response
AT+CMGR=<index>	text	+CMGR:<stat>,<number>,[<reserved>],<time> <data> OK
	PDU	+CMGR:<stat>,[<alpha>],<length> <pdu> OK

AT+CMGR=?		OK
Maximum Response Time	Depends on the length of message content.	

Defined value

Parameter	values		Explain
<index>			Value in the range of location numbers supported by the associated memory and start with zero.
<stat>	text	“REC UNREAD”	Received unread messages
		“REC READ”	Received read messages
		“STO UNSENT”	Stored unsent messages
		“STO SENT”	Stored sent messages
		“ALL”	All messages
	PDU	0	Received unread messages
		1	Received read messages
		2	Stored unsent messages
		3	Stored sent messages
		4	All messages
<number>			Sender number
<reserved>			null
<time>			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.
<alpha>			String type 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 AT+CSCS.
<length>			Message length.

Example

AT+CMGF=1

```

OK
AT+CNMI=1,1
OK

+CMTI: "SM",8
AT+CMGR=8
+CMGR: "REC UNREAD","15618593215",,"19:11:1216:19:33 GMT+8"
TEST10

OK
AT+CMGF=0
OK

+CMTI: "SM",9
AT+CMGR=9
+CMGR: 0,,25
0891683108200115F1240BA15116583912F500009111216102612306D4E2941A8B01

OK
    
```

10.11 AT+CMGD Delete Message

Description

The command is used to delete message from preferred message storage <mem1> location <index>.

Syntax

Command	Response
AT+CMGD=<index>[,<delflag>]	OK
AT+CMGD=?	OK
Maximum Response Time	300ms

Defined value

Parameter	values	Explain
<index>	0-255	Value in the range of location numbers supported by the associated memory and start with zero.

<delflag>	0	Delete the message specified in <index>.(or omitted)
	1	Delete all read messages from preferred message storage.
	2	Delete all read messages from preferred message storage and sent mobile originated messages.
	3	Delete all read messages from preferred message storage, sent and unsent mobile originated messages
	4	Delete all messages from preferred message storage including unread messages.

Example

```

AT+CMGL="ALL"
+CMGL: 1,"REC UNREAD","15618593215",,"19:11:1216:24:21 GMT+8"
TEST1

+CMGL: 2,"REC UNREAD","15618593215",,"19:11:1216:24:38 GMT+8"
TEST2

+CMGL: 3,"REC UNREAD","15618593215",,"19:11:1216:24:51 GMT+8"
TEST3

OK
AT+CMGD=3 //Delete the third message
OK
AT+CMGL="ALL"
+CMGL: 1,"REC READ","15618593215",,"19:11:1216:24:21 GMT+8"
TEST1

+CMGL: 2,"REC READ","15618593215",,"19:11:1216:24:38 GMT+8"
TEST2

OK
AT+CMGD=0,4 //Delete all text messages
OK
AT+CMGL="ALL"
OK

```

Chapter 11. HTTP&HTTPS

11.1 AT+HTTPSND Send http and https request

Description

This command is used to send http and https request.

Syntax

Command	Response
AT+HTTPSND=?	+HTTPSND: (0-2),(0-10),(0-1)... OK
AT+HTTPSND=<method>,<ssl_enable>,<hex_mode>,<url>[,<header>[,<body>]]	OK +HTTPSND:<result>
Maximum Response Time	determined by network and file size

Defined values

Parameter	values	Explain
<method>	0-1	HTTP request method 0 --- GET 1 --- POST
<ssl_enable>		0 //default 0 https: url Start with "https://"
<hex_mode>		Header and body data format for ASCII or HEX format when HTTP send and receive. 0 --- ASCII 1 --- HEX
<url>		Max 256 char Start with "http:// or https://"
<header>		Max 256 char, multiple headers are divided by -H, and the format is as follows: ASCII : " - H 'Connection=keep-alive' - H 'Content-Type=multipart/form-data' HEX : "E28093482027436F6E6E656374696F6E3D6B6565702D616C6976652720E28093482027436F6E74656E742D547970653D6D756C7469706172742F6666F726D2D6461746127"
<body>		Max 512 char
<result>	0-1	0 --- succeeded 1 --- failed

NOTE:

1. Execute the command AT+CGDCONT? to query if IP address is obtained before executing the command AT+HTTPSND .
2. In LTE mode, the PDN is automatically activated after successful registration, and can be used the command AT+HTTPSND directly. In WCDMA mode, you need to execute AT+CGACT=1,5 to activate the PDN, and then execute the command AT+HTTPSND after obtaining the IP address.

Example

HTTP:

AT+CGDCONT?

+CGDCONT: 5,"IP","wonet.mnc001.mcc460.gprs","10.226.177.186",0,0,,,

OK

ASCII mode:

AT+HTTPSND=0,0,0,http://203.156.205.55:8080/web/123.txt,"-H 'Connection: keep-alive'"

OK

+HTTPSND: 0

+HTTPRCV:291,HTTP/1.1 200 OK

Content-Type: text/plain

Content-Length: 46

Accept-Ranges: bytes

Server: HFS 2.3k

Set-Cookie: HFS_SID_=0.812043825862929; path=/; HttpOnly

ETag: 9ACD6BA42FA6D11C5E58D8CB8A5C93C8

Last-Modified: Mon, 25 Nov 2019 06:52:28 GMT

Content-Disposition: filename="123.txt";

+HTTPRCV:46,AAAAAAAAAAAA

BBBBBBBBBBBB

CCCCCCCCC

DDDDDDDDDD

HEX mode:

AT+HTTPSND=0,0,1,http://203.156.205.55:8080/web/123.txt,"2D482027436F6E6E6563746
96F6E3A206B6565702D616C69766527"

OK

+HTTPSND: 0

+HTTTPRCV:291,485454502F312E3120323030204F4B0D0A436F6E74656E742D54797065
3A20746578742F706C61696E0D0A436F6E74656E742D4C656E6774683A2034360D0A41
63636570742D52616E6765733A2062797465730D0A5365727665723A2048465320322E33
6B0D0A5365742D436F6F6B69653A204846535F5349445F3D302E38323233303637313330
38393334373B20706174683D2F3B20487474704F6E6C790D0A455461673A203941434436
4241343246413644313143354535384438434238413543393343380D0A4C6173742D4D6F6
469666965643A204D6F6E2C203235204E6F7620323031392030363A35323A323820474D5
40D0A436F6E74656E742D446973706F736974696F6E3A2066696C656E616D653D223132
332E747874223B0D0A0D0A

+HTTTPRCV:46,41414141414141414141410D0A424242424242424242420D0A434343434343
434343430D0A4444444444444444444444

HTTPS:

ASCII mode:

AT+HTTPSND=0,0,0,https://www.baidu.com,"-H 'Accept:*//*'"

OK

+HTTPSND: 0

+HTTTPRCV:1024,HTTP/1.0 200 OK

Accept-Ranges: bytes

Cache-Control: no-cache

Content-Length: 227

Content-Type: text/html

Date: Mon, 25 Nov 2019 07:33:47 GMT

```
P3p: CP=" OTI DSP COR IVA OUR IND COM "
P3p: CP=" OTI DSP COR IVA OUR IND COM "
Pragma: no-cache
Server: BWS/1.1
Set-Cookie: BD_NOT_HTTPS=1; path=/; Max-Age=300
Set-Cookie: BIDUPSID=FA9AA01407412E3F018C0F3FA2B9EC29; expires=Thu,
31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com
Set-Cookie: PSTM=1574667227; expires=Thu, 31-Dec-37 23:55:55 GMT;
max-age=2147483647; path=/; domain=.baidu.com
Set-Cookie: BAIDUID=FA9AA01407412E3F83015F87A948EF1B;FG=1;
max-age=31536000; expires=Tue, 24-Nov-20 07:33:47 GMT; domain=.baidu.com; path=/;
version=1; comment=bd
Strict-Transport-Security: max-age=0
Traceid: 1574667227042092493812560351979903126463
X-Ua-Compatible: IE=Edge,chrome=1

<html>
<head>
  <script>
    location.replace(location.href.replace("https://","http://"));
  </script>
</head>
<body>
  <noscript><meta http-equiv="refresh" content="

+HTTPRCV:58,0,url=http://www.baidu.com/"></noscript>
</body>
</html>

HEX mode:
AT+HTTPSND=0,0,1,https://www.baidu.com,"2D4820274163636570743A2A2F2A27"
OK
+HTTPSND: 0
```

```
+HTTTPRCV:512,485454502F312E3020323030204F4B0D0A4163636570742D52616E67657
33A2062797465730D0A43616368652D436F6E74726F6C3A206E6F2D63616368650D0A4
36F6E74656E742D4C656E6774683A203232370D0A436F6E74656E742D547970653A2074
6578742F68746D6C0D0A446174653A204D6F6E2C203235204E6F7620323031392030373
A33333A323120474D540D0A5033703A2043503D22204F54492044535020434F522049564
1204F555220494E4420434F4D20220D0A5033703A2043503D22204F54492044535020434
F5220495641204F555220494E4420434F4D20220D0A507261676D613A206E6F2D6361636
8650D0A5365727665723A204257532F312E310D0A5365742D436F6F6B69653A2042445F
4E4F545F48545450533D313B20706174683D2F3B204D61782D4167653D3330300D0A536
5742D436F6F6B69653A2042494455505349443D4344334346423933464146303930304345
3246413842354435363030433945383B20657870697265733D5468752C2033312D4465632
D33372032333A35353A353520474D543B206D61782D6167653D323134373438333634373
B20706174683D2F3B20646F6D61696E3D2E62616964752E636F6D0D0A5365742D436F6
F6B69653A205053544D3D313537343636373230313B20657870697265733D5468752C203
3312D4465632D33372032333A35353A3535
```

```
+HTTTPRCV:512,20474D543B206D61782D6167653D323134373438333634373B207061746
83D2F3B20646F6D61696E3D2E62616964752E636F6D0D0A5365742D436F6F6B69653A2
0424149445549443D4344334346423933464146303930304334313044323230333932453934
4641363A46473D313B206D61782D6167653D33313533363030303B20657870697265733D
5475652C2032342D4E6F762D32302030373A33333A323120474D543B20646F6D61696E3
D2E62616964752E636F6D3B20706174683D2F3B2076657273696F6E3D313B20636F6D6
D656E743D62640D0A5374726963742D5472616E73706F72742D53656375726974793A20
6D61782D6167653D300D0A547261636569643A2031353734363637323031303432313235
3236313831353234303637353731333039353833313036340D0A582D55612D436F6D70617
469626C653A2049453D456467652C6368726F6D653D310D0A0D0A3C68746D6C3E0D0A
3C686561643E0D0A093C7363726970743E0D0A09096C6F636174696F6E2E7265706C616
365286C6F636174696F6E2E687265662E7265706C616365282268747470733A2F2F222C22
687474703A2F2F2229293B0D0A093C2F7363726970743E0D0A3C2F686561643E0D0A3C
626F64793E0D0A093C6E6F7363726970743E3C6D65746120687474702D65717569763D2
2726566726573682220636F6E74656E743D22
```

```
+HTTTPRCV:58,303B75726C3D687474703A2F2F7777772E62616964752E636F6D2F223E3
C2F6E6F7363726970743E0D0A3C2F626F64793E0D0A3C2F68746D6C3E
```

11.2 AT+HTTPINIT Init the HTTP Service

Description

This command is used to init the HTTP Service.

Syntax

Command	Response
AT+HTTPINIT	OK
AT+HTTPINIT?	OK
AT+HTTPINIT=?	OK
Maximum Response Time	3s,determined by network

Example

AT+HTTPINIT

OK

11.3 AT+HTTPSSL Enable the SSL for HTTP

Description

This command is used to enable the ssl for HTTP.

Syntax

Command	Response
AT+HTTPSSL=<mode>	OK
AT+HTTPSSL?	+HTTPSSL: <mode> OK
AT+HTTPSSL=?	+HTTPSSL: (0-1) OK
Maximum Response Time	3s,determined by network

Defined value

Parameter	values	Explain
<mode>	0-1	0 --- disable the ssl (default) 1 --- enable the ssl

Example

AT+HTTPSSL=1

OK

11.4 AT+HTTTPARA Configure the HTTP Parameters

Description

This command is used to configure the http parameters.

Syntax

Command	Response
AT+HTTTPARA=<HTTTPParamTag>,<HTTTPParamValue>	OK
AT+HTTTPARA?	+HTTTPARA: list of <HTTTPParamTag>:<HTTTPParamValue>) OK
AT+HTTTPARA=?	+HTTTPARA: "HTTTPParamTag","HTTTPParamValue" OK
Maximum Response Time	3s,determined by network

Defined value

Parameter	values	Explain <HTTTPParamValue>
<HTTTPParamTag>	"CID"	0 --- default,not need to specify it by default 1-6 --- It needs to be activated with "+QIPACT" before it can be used
	"URL"	HTTP or HTTPS URL "http://server/path" Or "https://server/path"
	"UA"	User-Agent Defaule: _MODULE
	"USERDATA"	User-defined Http Header,Use \r\n to separate multiple items "Content-Type:application/json\r\nAPPKEY:FW"

Example

```
AT+HTTTPARA="UA","_MODULE"
```

```
OK
```

```
AT+HTTTPARA="URL","http://xxxxxxxxx/HTTP/1111.amr"
```


OK

//Add user-defined http headers, maybe need to replace "\r\n" with "\\r\\n" on some PC tools

AT+HTTPPARA="USERDATA","Content-Type:application/json\r\nAPPKEY:FW"

OK

11.5 AT+HTTPDATA Input HTTP DATA

Description

This command is used to input the http data for POSTmethod.

Syntax

Command	Response
AT+HTTPDATA=<size> ,<time>	DOWNLOAD OK
AT+HTTPDATA?	OK
AT+HTTPDATA=?	+HTTPDATA: (0-102400),(1000-120000) OK
Maximum Response Time	300ms,determined by network

Defined value

Parameter	values	Explain
<size>	0-102400	0 --- clean the HTTP post Data 1-102400 --- data Size
<time>	1000-120000	Timeout time(ms)

Example

AT+HTTPDATA=10,1000

DOWNLOAD

1111111111

OK

11.6 AT+HTTPACTION HTTP active method

Description

This command is used to active the http cmd.

Syntax

Command	Response
AT+HTTPACTION=<method>	OK +HTTPACTION: <method>,<httpCode>,<dataLen>
AT+HTTPACTION=?	+HTTPACTION: (0-2) OK
Maximum Response Time	3s,determined by network

Defined value

Parameter	values	Explain
<method>	0-2	0 --- GET 1 --- POST 2 --- HEAD
<httpCode>		100 --- Continue 101 --- Switching Protocols 200 --- OK 201 --- Created 202 --- Accepted 203 --- Non-Authoritative Information 204 --- No Content 205 --- Reset Content 206 --- Partial Content 300 --- Multiple Choices 301 --- Moved Permanently 302 --- Found 303 --- See Other 304 --- Not Modified 305 --- Use Proxy 307 --- Temporary Redirect 400 --- Bad Request 401 --- Unauthorized 402 --- Payment Required 403 --- Forbidden 404 --- Not Found

		405 --- Method not Allowed 406 --- Not Acceptable 407 --- Proxy AuthenticationRequired 408 --- Request Time-out 409 --- Conflict 410 --- Gone 411 --- Length Required 412 --- Precondition Failed 413 --- Request Entity Too Large 414 --- Request-URI Too Large 415 --- Unsupported Media Type 416 --- Requested range not satisfiable 417 --- Expectation Failed 500 --- Internal Server Error 501 --- Not Implemented 502 --- Bad Gateway 503 --- Service Unavailable 504 --- Gateway Time-out 505 --- HTTP Version not supported 600 --- Not HTTP PDU 601 --- Network Error 602 --- No memory 603 --- DNS Error 604 --- Stack Busy 605 --- SSL setup failed 606 --- SSL alert error
<dataLen>		HTTP download data len

Example

AT+HTTPACTION=0 //0: GET, 1: PUT

OK

+HTTPACTION: 0,200,1460

```
+HTTPACTION: 0,200,2048
```

```
.....
```

```
+HTTPACTION: 0,200,2048
```

```
+HTTPACTION: 0,200,2048
```

```
+HTTPACTION: 0,200,212
```

11.7 AT+HTTPREAD Read the HTTP Data

Description

This command is used to read the http data.

Syntax

Command	Response
AT+HTTPREAD=<start_address>,<byte_size>	+HTTPREAD:<date_len> <data> OK
AT+HTTPREAD	+HTTPREAD:<date_len> <data> OK
AT+HTTPREAD=?	OK
Maximum Response Time	300ms,determined by network

Defined value

Parameter	values	Explain
<start_address>	0-262144	Http data start address
<byte_size>	1-262144	Http data read bytes

Example

```
AT+HTTPREAD=103500,2048
```

```
+HTTPREAD: 4
```

1234

OK

11.8 AT+HTTPHEAD Read HTTP Header

Description

This command is used to read the http header.

Syntax

Command	Response
AT+HTTPHEAD	+HTTPREAD:<date_len> <data> OK
AT+HTTPHEAD=?	OK
Maximum Response Time	300ms,determined by network

Defined value

Parameter	values	Explain
<date_len>		http header len

Example

AT+HTTPHEAD

+HTTPHEAD: 279

Content-Disposition: attachment; filename="1111.amr";

Last-Modified: Fri, 26 Feb 2021 05:42:35 GMT

ETag: A2D2F99124BFA321EA69B492928C586F

Set-Cookie: HFS_SID_=0.646366314496845; path=/; HttpOnly

Server: HFS 2.3m

Accept-Ranges: bytes

Content-Type: application/octet-stream

OK

11.9 AT+HTTPTERM Termination the HTTP Service

Description

This command is used to termination HTTP Service.

Syntax

Command	Response
AT+HTTPTERM	OK
AT+HTTPTERM=?	OK
Maximum Response Time	300ms,determined by network

Example

AT+HTTPTERM

OK

11.10 HTTP Example

HTTP GET:

AT+HTTPINIT

OK

AT+HTTPPARA="URL","http://xx.99.180.xxx/HTTP/1111.amr"

OK

AT+HTTPACTION=0 //0: GET, 1: PUT

OK

+HTTPACTION: 0,200,1460

+HTTPACTION: 0,200,2048

.....

+HTTPACTION: 0,200,2048

+HTTPACTION: 0,200,2048

+HTTPACTION: 0,200,212

AT+HTTPREAD?

+HTTPREAD: 103504

OK

AT+HTTPREAD=0,2048

+HTTPREAD: 2048

#!AMR

.....吹 @?损\$%9 匏嬭报寺 k?湘

3n 枊 41 鵝 s?c

OK

AT+HTTPREAD=103500,2048

+HTTPREAD: 4

m 億

OK

AT+HTTPTERM

OK

HTTP POST:

AT+HTTPINIT

OK

AT+HTTPSSL=1

OK

AT+SSLCFG="hostname",153,"fanyi.baidu.com"

OK

AT+HTTPPARA="URL","https://fanyi.baidu.com"

OK

AT+HTTPDATA=4,3000

DOWNLOAD

中国

OK

AT+HTTPACTION=1

OK

+HTTPACTION: 1,200,207296

AT+HTTPREAD=207280,10

+HTTPREAD: 10

</html>

OK

Chapter 12. Voice Call (for cat1 modules)

12.1 AT+VTYPE Set type of speech

Description

The command is used to set the type of voice. The default value is 2, which indicated the type of speech is PCM.

Syntax

Command	Response
AT+VTYPE=<type>	OK
AT+VTYPE?	+VTYPE: <type> OK
AT+VTYPE=?	+VTYPE: (2,3,4) OK

Defined values

Parameter	values	Explain
<type>	2,3,4	2 --- PCM speech 3 --- Analog speech 4 --- Analog speech

Example

AT+VTYPE?

+VTYPE: 2

OK

AT+VTYPE=?

+VTYPE: (2,3,4)

OK

AT+VTYPE=3

OK

12.2 ATD Dial Command

Description

The dial command can be used to set up outgoing voice and data calls.

Syntax

Command	Response
ATD[digits][I/i][;]	OK

Defined values

Parameter	values	Explain
[digits]	0-9, *, #, +	Ready (ME allows commands from TA/TE)
[I/i]	I	Activates CLIR
	i	Deactivates CLIR
[;]		The termination character ";" is mandatory to set up voice calls.

Examples

ATD10010;

OK

^ORIG:0,0

^CONN:0,0

12.3 ATA Call Answer

Description

Connects the module to an incoming voice or data call indicated by a "RING" URC.

Syntax

Command	Response
ATA	OK

Examples

RING

RING

ATA

OK

^CONN:3,0

12.4 AT+CHUP Hang Up Call

Description

The command is used to cancel voice calls.

Syntax

Command	Response
AT+CHUP	OK

Examples

```
ATD18521XXXXXX;
```

```
OK
```

```
^ORIG:1,0
```

```
^CONN:1,0
```

```
AT+CHUP
```

```
OK
```

```
^CEND:1,25,29
```

12.5 AT+CLCC List Current Calls

Description

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

Syntax

Command	Response
AT+CLCC	+CLCC:<idx>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>[,<priority>]]] OK
AT+CLCC=?	OK

Defined values

Parameter	values	Explain
<idx>		Integer type, call identification number, this number can be used in +CHLD command operations.
<dir>	0	Mobile originated (MO) call

	1	Mobile terminated (MT) call
<stat>	0	Active
	1	Held
	2	Dialing (MO call)
	3	Alerting (MO call)
	4	Incoming (MT call)
	5	Waiting (MT call)
<mode>	0	Voice
	1	Data
	2	Fax
<mpty>	0	Call is not one of multiparty (conference) call parties
	1	Call is one of multiparty (conference) call parties
<number>		String type phone number in format specified by <type>.
<type>	129	Unknown type
	145	International number type
	161	National type
<alpha>		String type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set AT+CSCS.
<priority>		

Example

```
ATD138XXXXXXXXX;
```

```
OK
```

```
^ORIG:2,0
```

```
AT+CLCC
```

```
+CLCC: 1,0,3,0,0,"138XXXXXXXXX",129
```

```
OK
```

```
^CONN:2,0
```

AT+CLCC

+CLCC: 1,0,0,0,0,"138XXXXXXXXX",129

OK

AT+CHUP

OK

^CEND:2,5,29

12.6 AT+CLVL Loudspeaker volume level

Description

The command is used to select the volume of the internal loudspeaker audio output of the device.

Syntax

Command	Response
AT+CLVL=<level>	OK
AT+CLVL?	+CLVL: <level> OK
AT+CLVL=?	+CLVL: (0-5) OK

Defined value

Parameter	values	Explain
<level>	0-5	Integer type value which represents loudspeaker volume level. The range is from 0 to 5, and 0 represents the lowest loudspeaker .

Example

AT+CLVL?

+CLVL: 3

OK

AT+CLVL=4

OK

12.7 AT+CMICGAIN Microphone gain control

Description

The command controls microphone gain. The default value is 4.

Syntax

Command	Response
AT+CMICGAIN=<level>	OK
AT+CMICGAIN?	+CMICGAIN: <level> OK
AT+CMICGAIN=?	+CMICGAIN: (0-8) OK

Defined value

Parameter	values	Explain
<level>	0-8	MIC gain level,default value is 4

Example

AT+CMICGAIN?

+CMICGAIN: 6

OK

AT+CMICGAIN=?

+CMICGAIN: (0-8)

OK

AT+CMICGAIN=5

OK

12.8 AT+VMUTE Speaker mute control

Description

This command is used to control the loudspeaker to mute and unmute during a voice call or a video call which is connected. If there is not a connected call, write command can't be used. When all calls are disconnected, the Module sets the subparameter as 0 automatically.

Syntax

Command	Response
AT+VMUTE=<mode>	OK
AT+VMUTE?	+VMUTE: <mode> OK
AT+VMUTE=?	+VMUTE: (0-1) OK

Defined value

Parameter	values	Explain
<mode>	0-1	0 --- mute off 1 --- mute on

Example

AT+VMUTE?

+VMUTE: 0

OK

AT+VMUTE=?

+VMUTE: (0-1)

OK

AT+VMUTE=1

OK

12.9 AT+CMUT Microphone mute control**Description**

This command is used to enable and disable the uplink voice muting during a voice call or a video call which is connected. If there is not a connected call, write command can't be used.

When all calls are disconnected, the Module sets the subparameter as 0 automatically.

Syntax

Command	Response
AT+CMUT=<mode>	OK
AT+CMUT?	+CMUT: <mode> OK
AT+CMUT=?	+CMUT: (0-1)

	OK
--	----

Description

Parameter	values	Explain
<mode>	0-1	0 --- mute off 1 --- mute on

Example

AT+CMUT?

+CMUT: 0

OK

AT+CMUT=?

+CMUT: (0-1)

OK

AT+CMUT=1

OK

12.10 RING Incoming Call Bell

Description

When the mobile terminal has called, the MT will be periodic (T=6s) to report this instruction to TE.

Syntax

Command	Response
	RING

Example

RING

RING

ATA

OK

^CONN:3,0

12.11 ^ORIG Outgoing Call Bell

Description

MT is initiating a call.

Syntax

Command	Response
	^ORIG:<call_id>,<call_type>

Defined value

Parameter	values	Explain
<call_id>		Integer type, call identification number, this number can be used in +CHLD command operations.
<call_type>	0	Voice call
	9	Emergency call

Example

ATD10010;

OK

^ORIG:4,0

^CONN:4,0

12.12 ^CONN Call Answering Indication

Description

When the call is switched on, the MT reports to the TE to indicate that the current state has changed to a call state.

Syntax

Command	Response
	^CONN:<call_id>,<call_type>

Defined value

Parameter	values	Explain
<call_id>		Integer type, call identification number, this number can be used in +CHLD command operations.
<call_type>	0	Voice call
	9	Emergency call

Example

ATD10010;

OK

^ORIG:4,0

^CONN:4,0

12.13 ^CEND Call End Indication

Description

When the call is over, MT reports this instruction to the TE, informs the TE that the reason of call end and the call duration .

Syntax

Command	Response
	^CEND:<call_id>,<duration>,<end_status>

Defined values

Parameter	values	Explain
<call_id>		Integer type, call identification number, this number can be used in +CHLD command operations.
<duration>		Call duration , in seconds
<end_status>		Call end reason

Example

ATD10010;

OK

^ORIG:4,0

^CONN:4,0

AT+CHUP

OK

^CEND:4,4,29

12.14 ATS0 Automatic Answer

Description

The S-parameter command controls the automatic answering feature of the Module. If set to 000, automatic answering is disabled, otherwise it causes the Module to answer when the incoming call indication (RING) has occurred the number of times indicated by the specified value; and the setting will not be stored upon power-off, i.e. the default value will be restored after restart.

Syntax

Command	Response
ATS0=<n>	OK
ATS0?	<n> OK

Defined values

Parameter	values	Explain
<n>	0	Automatic answering mode is disable.
	1~255	Enable automatic answering on the ring number specified.

Example

ATS0=3

OK

RING

RING

RING

^CONN:11,0

12.15 AT^NVAUTO Automatic Answer

Description

The command used to set whether to automatically answer.

Syntax

Command	Response
---------	----------

AT^NVAUTO=<mode>	OK
AT^NVAUTO?	^NVAUTO: <mode> OK

Defined value

Parameter	values	Explain
<mode>	0	Automatic answering mode is disable.
	1	Automatic answering mode is enable.

Example

```
AT^NVAUTO=1
```

```
OK
```

```
RING
```

```
^CONN:11,0
```

12.16 AT^DTMF Dual Tone Multi-Frequency**Description**

Call state, by signaling to send DTMF value to the network side.

Syntax

Command	Response
AT^DTMF=<number>[,<on_length>[,<off_length>]]	OK or +CME ERROR:<err>

Defined values

Parameter	values	Explain
<number>	0-9,*,#,A,B,C,D	DTMF value
<on_length>	0	Press
	1	Lift
	95,150,200,250,300,350	DTMF tone duration, in ms
<off_length>	hold	Interval time of DTMF tone

Example

```
ATD02150177336; //Dialled the operator.
```

```
OK
```

```
^ORIG:4,0
```

```

^CONN:4,0
AT^DTMF=8           //Dial 8006 extension
OK
AT^DTMF=0
OK
AT^DTMF=0
OK
AT^DTMF=6
OK
AT+CHUP
OK

^CEND:4,13,29
    
```

12.17 AT+SETVOLTE Set VOLTE

Description

The command is used to open or close VOLTE, it take effect after the restart using the command AT+CFUN=1,1.

Syntax

Command	Response
AT+SETVOLTE=<mode>	OK
AT+SETVOLTE?	+SETVOLTE: <mode> OK

Defined values

Parameter	values	Explain
<mode>	0	Close VOLTE
	1	Open VOLTE (default)

Example

```

AT+SETVOLTE?
+SETVOLTE: 1

OK
AT+SETVOLTE=0
    
```

OK

AT+CFUN=1,1

OK

[AT+SETVOLTE?](#)

+SETVOLTE: 0

OK

Chapter 13. GPS (for cat1 modules)

13.1 AT+CGPS Start/Stop GPS session

Description

This command is used to start or stop GPS session.

After the module is powered on and the module port appears, please wait at least 20s and then send the command AT+CGPS=1.

Syntax

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

Defined value

Parameter	values	Explain
<on/off>	0-1	0 --- off stop GPS session 1 --- on start GPS session

Example

AT+CGPS=1

OK

.....

\$GNRMC,070019.00,A,3110.4244,N,12136.0802,E,1.718,,220620,,,A,V*18

\$GNGGA,070019.00,3110.4244,N,12136.0802,E,1,09,1.30,85.3,M,,M,,*6E

\$GNGLL,3110.4244,N,12136.0802,E,070019.00,A,A*70

\$GNGSA,A,3,03,04,05,09,19,193,195,,,,,1.73,1.30,1.14,1*07

\$GNGSA,A,3,19,21,,,,,,,,,1.73,1.30,1.14,4*0C

\$GPGSV,3,1,09,03,08,040,35,04,22,074,29,05,13,220,27,09,31,114,22,0*66

\$GPGSV,3,2,09,19,72,020,22,17,67,088,,12,,,19,193,59,126,26,0*68

\$GPGSV,3,3,09,195,72,099,28,0*6E

\$GBGSV,1,1,02,19,44,054,38,21,19,201,33,0*7F

\$GNVTG,T,,M,1.718,N,3.181,K,A*39

13.2 AT+CGPSINFO Get GPS fixed position information

Description

This command is used to get current position information.

Syntax

Command	Response
AT+CGPSINFO	+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>] OK
AT+CGPSINFO?	+CGPSINFO: 0 OK
AT+CGPSINFO=?	+CGPSINFO: (0-255) OK

Defined value

Parameter	values	Explain
<lat>		Latitude of current position. Output format is ddmm.mmmmmm
<N/S>		N/S Indicator, N=north or S=south
<log>		Longitude of current position. Output format is dddmm.mmmmmm
<E/W>		E/W Indicator, E=east or W=west
<date>		Date. Output format is ddmmyy
<UTC time>		UTC Time. Output format is hhmmss.s
<alt>		MSL Altitude. Unit is meters.
<speed>		Speed Over Ground. Unit is knots
<course>		Course. Degrees.

Example

[AT+CGPSINFO](#)

+CGPSINFO: 3110.3880,N,12136.0362,E,,075345.00,12.1,0.341,

OK

13.3 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: (list of supported <port>s) 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?

+CGPSPORT: 1

OK

AT+CGPSPORT=?

+CGPSPORT: (0,3)

OK

AT+CGPSPORT=2

OK

13.4 AT+CGPSPOS Read NMEA information

Description

The command is used to read NMEA information.

Syntax

Command	Response
AT+CGPSPOS=<mode>	\$<NMEA>,<nmea information> OK
AT+CGPSPOS?	OK
AT+CGPSPOS=?	+CGPSPOS: (0-5)

	OK
--	----

Defined value

Parameter	values	Explain
<mode>	0,1	0 --- GNGGA 1 --- GNGSA 2 --- GPGSV 3 --- GNRMC 4 --- GPVTG 5 --- GNGLL
<nmea information>		This information corresponds to NMEA. Please refer to section 15.10 for details.

Example

[AT+CGPSPOS=0](#)

\$GNGGA,075421.00,3110.3946,N,12136.0509,E,1,07,5.23,55.7,M,,M,,*6D

OK

[AT+CGPSPOS=1](#)

\$GNGSA,A,3,19,,,,,,,,,,,,,7.74,5.23,5.71,4*0F

OK

[AT+CGPSPOS=2](#)

\$GPGSV,2,1,08,04,17,050,25,09,39,083,29,17,49,131,32,19,69,117,27,0*61

\$GPGSV,2,2,08,05,33,235,,06,57,012,16,195,70,125,27,193,67,115,,0*6A

\$GPGSV,1,1,0,

\$GPGSV,1,1,0,

OK

13.5 NMEA message specification

13.5.1 GNRMC

Data format:

\$GPRMC,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>*<13><CR><LF>

Data	Description
\$GPRMC	Message ID
<1>	UTC time
<2>	Mode

	M --- Manual , forced to operate in 2D or 3D mode A --- Allowed to automatically switch 2D/3D
<3>	Latitude ,format as ddmm.mmmm
<4>	N/S indicator, N-north ,S-south
<5>	Longitude , format as dddmm.mmmm
<6>	E/W indicator , E-east,W-west
<7>	Speed over ground
<8>	Course over ground
<9>	Date , format as ddmmyy
<10>	Magnetic variation
<11>	East/West indicator E-east or W-west
<12>	Mode A --- Autonomous D --- DGPS
<13>	checksum
<CR><LF>	End of message termination

Example

```
$GNRMC,081425.00,A,3110.3946,N,12136.0186,E,0.432,,220620,,,A,V*1C
```

name	Data	Description	Note
Message ID	\$GNRMC		
UTC time	081425.00	16:14:25.00	UTC+8h
Mode	A/V	Status A=Data is valid V=Invalid data	
Latitude	3110.3946	31 °10'23.676"	0.3946×60=23.676"
N/S indicator	N	N-north	
Longitude	12136.0186	121 °36'1.116"	0.0186×60=1.116"
E/W indicator	E	E-east	
Speed over ground	0.432		
Course over ground			
Date	220620	2020.6.22	
Magnetic variation			
East/West indicator			
Mode	A	A --- Autonomous	

checksum	*27		
----------	-----	--	--

13.5.2 GNGGA GPS Fixed Data

Data format:

\$GNGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,M,<10>,M,<11>,<12>*xx<CR><LF>

Data	Description
\$GNGGA	Message ID
<1>	UTC time , format as hhmmss.sss
<2>	Latitude ,format as ddmm.mmmmm
<3>	N/S indicator, N-north ,S-south
<4>	Longitude , format as dddmm.mmmmm
<5>	E/W indicator , E-east,W-west
<6>	GPS Status 0 --- invalid 1 --- valid
<7>	Satellites used
<8>	Horizontal dilution of precision
<9>	MSL altitude, Unit is meters
M	Unit of <9>,meters
<10>	Geoid separation, Unit is meters
M	Unit of <10>,meters
<11>	Age of Diff. Corr , null fields when DGPS is not used
<12>	Diff.Ref.Station ID
*xx	checksum
<CR><LF>	End of message termination

Example

\$GNGGA,081425.00,3110.3946,N,12136.0186,E,1,08,3.85,17.1,M,,M,,*64

name	Data	Description	Note
Message ID	\$GNGGA		
UTC time	081425.00	16:14:25.00	UTC+8h
Latitude	3110.3946	31 °10'23.676"	0.3946 ×60=23.676"
N/S Indicator	N	North Latitude	

Longitude	12136.0186	121 36'1.116"	0.0186 ×60=1.116"
E/W Indicator	E	East Longitude	
GPS Status	1	Valid	
Satellites used	08	Using 8 Satellites	
HDOP	3.85	Horizontal dilution of precision	
MSL altitude	17.1	17.1m	
M	M	Meters	
Geoid separation			
M	M	Meters	
Age of Diff. Corr	null		
Diff.Ref.Station ID	null		
checksum	*60		

13.5.3 GNGLL Geolocation information

Data format:

\$GNGLL,<1>,<2>,<3>,<4>,<5>,<6>*hh<CR><LF>

Data	Description
\$GNGLL	Message ID
<1>	Latitude ,format as ddmm.mmmmm
<2>	N/S indicator, N-north ,S-south
<3>	Longitude , format as dddmm.mmmmm
<4>	E/W indicator , E-east,W-west
<5>	UTC time , format as hhmmss.sss
<6>	GPS Status A --- valid V --- invalid
*hh	checksum
<CR><LF>	End of message termination

Example

\$GNGLL,3110.3946,N,12136.0186,E,081425.00,A,A*7E

name	Data	Description	Note
------	------	-------------	------

Message ID	GNGLL		
Latitude	3110.3946	31 10'23.676"	0.3946 ×60=23.676"
N/S Indicator	N	North Latitude	
Longitude	12136.0186	121 36'1.116"	0.0186 ×60=1.116"
E/W Indicator	E	East Longitude	
UTC time	081425.00	16:14:25.00	UTC+8h
GPS Status	A	Data is valid	
checksum	*7E		

13.5.4 GNGSA Current satellite information

Data format:

\$GNGSA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>,<15>,<16>,<17>*<18><CR><LF>

Data	Description
\$GNGGA	Message ID
<1>	Mode 1 M --- Manual , forced to operate in 2D or 3D mode A --- Allowed to automatically switch 2D/3D
<2>	Mode 2 1 --- Not available 2 --- 2D 3 --- 3D
<3>	Satellite used , SV on channel 1
<4>	Satellite used , SV on channel 2
<5>	Satellite used , SV on channel 3
<6>	Satellite used , SV on channel 4
<7>	Satellite used , SV on channel 5
<8>	Satellite used , SV on channel 6
<9>	Satellite used , SV on channel 7
<10>	Satellite used , SV on channel 8
<11>	Satellite used , SV on channel 9
<12>	Satellite used , SV on channel 10
<13>	Satellite used , SV on channel 11
<14>	Satellite used , SV on channel 12

<15>	PDOP (0.5 - 99.9)
<16>	HDOP (0.5 - 99.9)
<17>	VDOP (0.5 - 99.9)
<18>	checksum
<CR><LF>	End of message termination

Example

\$GNGSA,A,3,04,06,09,17,195,19,193,,,,,5.12,3.85,3.37,1*0D

name	Data	Description	Note
Message ID	\$GNGSA		
Mode 1	A	Allowed to automatically switch 2D/3D	
Mode 2	3	3D	
Satellite used	04	SV on channel 1	
Satellite used	06	SV on channel 2	
...	...	...	
Satellite used		SV on channel 12	
PDOP	5.12	Position Dilution of Precision	
HDOP	3.85	Horizontal Dilution of Precision	
VDOP	3.37	Vertical Dilution of Precision	
checksum	*0D	End of message termination	

13.5.5 GPGSV GNSS Satellites in View

Data format:

\$GPGSV,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<4>,<5>,<6>,<7>,<4>,<5>,<6>,<7>,<4>,<5>,<6>,<7>* <8><CR><LF>

Data	Description
\$GPGSV	Message ID
<1>	Total number of GSV message to be sent in this group
<2>	Message number in this group of GSV message
<3>	Satellites in view
<4>	Satellite ID
<5>	Elevation

<6>	Azimuth
<7>	SNR (C/N0) , dBHz
<8>	checksum
<CR><LF>	

Example

\$GPGSV,2,1,08,04,13,043,41,06,56,029,29,09,38,071,31,17,41,139,33,0*61

\$GPGSV,2,2,08,19,61,133,27,05,40,243,,195,68,133,27,193,70,109,21,0*62

name	Data	Description	Note
Message ID	\$GPGSV		
Number of message	2	Total number of GSV message is 4	
Message number	1	Message number in this group of GSV message is 1	
Satellites in view	08	Number of Satellites in view is 13	
Satellite ID	04	Satellite ID	
Elevation	13	Elevation	
Azimuth	043	Azimuth	
SNR (C/N0)	41	23dBHz	
checksum	*61		

13.5.6 GBGSV BeiDou Satellites in View

Data format:

\$GBGSV,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<4>,<5>,<6>,<7>,<4>,<5>,<6>,<7>*<8><CR><LF>

Data	Description
\$GBGSV	Message ID
<1>	Total number of GSV message to be sent in this group
<2>	Message number in this group of GSV message
<3>	Satellites in view
<4>	Satellite ID
<5>	Elevation
<6>	Azimuth
<7>	SNR (C/N0) , dBHz

<8>	checksum
<CR><LF>	

Example

\$GBGSV,1,1,03,19,19,041,,21,49,214,,35,41,118,31,0*41

Data	Description
\$GBGSV	Message ID
<1>	Total number of GSV message to be sent in this group
<2>	Message number in this group of GSV message
<3>	Satellites in view
<4>	Satellite ID
<5>	Elevation
<6>	Azimuth
<7>	SNR (C/N0) , dBHz
<8>	checksum
<CR><LF>	

13.5.7 GNVTG Ground velocity information

Data format:

\$GNVTG,<1>,T,<2>,M,<3>,N,<4>,K,<5>*<6><CR><LF>

Data	Description
\$GNVTG	Message ID
<1>	Course ,measured heading
T	Reference , true north
<2>	Course , measured heading
M	Reference ,Magneticl north
<3>	Speed ,measured horizontal speed
N	Units,knots
<4>	Speed km/hr measured horizontal speed
K	Units , Kilometers per hour
<5>	Mode A --- Autonomous D --- DGPS

*<6>	checksum
<CR><LF>	End of message termination

Example

\$GNVTG,T,,M,0.432,N,0.801,K,A*31

name	Data	Description	Note
Message ID	\$GNVTG		
Course			
Reference	T	Reference , true	
Course		measured heading	
Reference	M	Magneticl	
Speed	0.432	measured horizontal speed	
Units	N	Knots	
Speed	0.801	measured horizontal speed	
Units	K	Kilometers per hour	
Mode	A	Autonomous	
checksum	*31		

Chapter 14. WIFI((for cat1 modules))

14.1 AT*WIFICTRL positioning function

Descripti

ASR extended AT command to control WIFI scan function.,After successfully scanning WiFi, it will actively report data.

Syntax

Command	Response
AT*WIFICTRL=<option>	OK or +CME ERROR: <err>
AT*WIFICTRL?	*WIFICTRL: <option> OK or +CME ERROR: <err>
AT*WIFICTRL=?	*WIFICTRL: (0-1)

Defined value

Parameter	values	Explain
<on/off>	0-1	0 - stop to scan wifi hotspot 1 - start to scan wifi hotspot

Example

```
AT*WIFICTRL=1
```

```
OK
```

```
*WIFICELLINFO:"88C397F8D707",-50,6
```

```
*WIFICELLINFO:"9CA615B940BD",-62,11
```

```
*WIFICELLINFO:"2076933EE934",-68,13
```

```
*WIFICELLINFO:"5C63BF407BFC",-68,4
```

```
*WIFICELLINFO:"9CA615B94227F",-70,1
```

```
*WIFICELLINFO:"CA50E9D35ACB",-76,1
```

```
*WIFICELLINFO:"9CA61557E820",-77,7
```

14.2 *WIFICELLINFO Unsolicited result code

Description

ASR extended AT command to indicate the searched wifi hotspot information.

Command	Response
	* WIFICELLINFO: <mac addr>, <rssi>, <channel_num>

Defined value

Parameter	values	Explain
<mac addr>		string type, MAC address
<rssi>		integer type, receive signal, in dBm
<channel_num>		integer type

Example

AT*WIFICTRL=1

OK

*WIFICELLINFO:"88C397F8D707",-50,6

*WIFICELLINFO:"9CA615B940BD",-62,11

*WIFICELLINFO:"2076933EE934",-68,13

*WIFICELLINFO:"5C63BF407BFC",-68,4

*WIFICELLINFO:"9CA615B94227F",-70,1

*WIFICELLINFO:"CA50E9D35ACB",-76,1

*WIFICELLINFO:"9CA61557E820",-77,7

Chapter 15.AT Commands for File System

15.1 AT*WIFIICTRL positioning function

Description

This command is used to read the cache file. The default module cache file name is <dst.txt>.

Syntax

Command	Response
AT+FSREAD=<filename>,<mode> >,<size>,<offset>	+FSREAD: <size> 111111111 OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<file_name>		filename
<mode>		Read mode
<size>	1024	Read data size
<offset>	1024	Offset of the starting position

Example

```
AT+FSREAD="dst.txt",1,1024,0
```

```
+FSREAD: 5
```

```
12345
```

```
OK
```

15.2 AT+FSATTRI Read file temporary space

Description

This directive is used to read the size of the downloaded file.

Syntax

Command	Response
---------	----------

AT+FSATTRI="dst.txt"	+FSATTRI: < file_size>,< time > OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<file_size>		filesize
<time>		modification time

Example

```
AT+FSATTRI="dst.txt"
+FSATTRI: 5,0085/09/25 23:04:32 5
OK
```

15.3 AT+FSDEL Delete file

Description

This command is used to delete a downloaded file.

Syntax

Command	Response
AT+FSDEL	AT+FSDEL=< file_name > OK
Maximum Response Time	300ms

Defined values

Parameter	values	Explain
<file_name>		filename

Example

```
AT+FSDEL="dst.txt"
OK
```

15.4 AT+FSMEM Querying Available Memory

Description

This command is used to obtain the internal free space of a module.

Syntax

Command	Response
AT+FSMEM	+FSMEM: < memsize > OK
Maximum Response Time	300ms

Example

AT+FSMEM

+FSMEM: 786432 bytes

OK

15.5 AT+FSCD Select directory as current directory

Description

This command is used to select a directory. The Module supports absolute path and relative path..Read Command will return current directory without double quotation marks.support SDcard.

Syntax

Command	Response
AT+FSCD=?	OK
AT+FSCD?	+FSCD: <curr_path> OK
AT+FSCD=<path>	+FSCD:<curr_path> OK or ERROR

Example

AT+FSCD=C:

+FSCD: C:/

OK

AT+FSCD=C:/

+FSCD: C:/

OK

AT+FSCD?

+FSCD: C:/

OK

AT+FSCD=..

+FSCD: C:/

OK

AT+FSCD=D:

+FSCD: D:/

OK

AT+FSCD?

+FSCD:D:/

OK

Revision

V0.1 2025-09-02

+ Create

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