GOSUNCN

Welink your smart

ME3630

AT Command Reference Guide

Version: V2.7

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LTE Module Series

Website: www.gosuncnwelink.com

E-mail: welink@gosuncn.com

About This Document

A. Application Range

R&D personnel using LTE modules to make the second development

B. Reading Note

The symbols below are the reading notes you should pay attention on:

: Warning or Attention

: Note or Remark

Application Product

PRODUCT
ME3630-U
ME3630-E
ME3630-J
ME3630-A
GM500

NOTE:

1. The command set will be updated from time to time. If the module in your hand does not support some commands, you can try to upgrade the module to the latest national network version.

2. You can confirm the latest instruction set version by looking for the "GOSUNCN_xxxx_xxxx_Fimrware_Release_Notes" released together with the module software version.

3. Not all modules support the * standard instructions. For the actual supported version number, please refer to "GOSUNCN_xxxx_xxxx_Fimrware_Release_Notes"

Revision History

Version	Date	Type of Revision
V1.0	2016-12-26	First version
V1.1	2013-04-24	Add command of GPS in chapter 11 Add commands AT+ZSPWAKEUP,AT+ZWAKEUPNUM,AT+ZWAKEUPSMS , AT+ZBAND ,AT+ZGNMEA in chapter 14. Update command of +ZCELLINFO,+ZADSET,+ZPAS, ZGRST,+ZCDS
1.2	2017-06-15	Update command of +ZCELLINOF, +ZIPCLOSE, +CEREG,+ZADSET
1.3	2017-06-29	Add command of +ZIPCREATE
1.4	2017-08-19	Update the doc
1.5	2017-11-16	Update command for GPIO function +ZCDS,+ZBAND,+ZIPOPEN,+ZIPLISTEN,+CFUN,+CNMA, +CNMI,+CCLK,&F Add commands of +ZARFCN, +ZSRSP,+ZRSP,+ZSNTE,+CMUX, +ZIPCONTEXT, $QCPDPP,+CGEQOSRDP, +CGEQOS, Add commands of FTP&HTTP
1.6	2017-11-07	Update +ZGPIO ,+CLCK , +CFUN,+CPWD,+CNUM,+COPS,+ZBAND,+CMGC,+BAND command Delete command of +CNMA
1.7	2018-03-15	Update command +ZSWICH,+ZDNSGETIP,+ZIPCONTEXT,+CSMP,+CEREG,+ZSRSP,+CMGC, +CPMS, +ZGPIO, GPS relative commands Add command of +ZMONI, +ZCLRACQ, Add chapter of 2.2 Setting Commands Saving Delete phonebook commands
1.8	2018-04-29	Update the format of document
1.9	2018-05-15	Update +ZIPCREATE, +ZDST, +ZGPSR ,+ZNVWRITE, +ZNVREAD, +ZBAND commands Add +ZECMCALL ,ZADB command Update the notes of +ZGRST and +ZGPSR commands
V2.0	2018-07-12	Update ATI ,+ZGFIXRATE commands Add +ZGPORT, +ZLOCKCELL command Delete +CGEQOSRDP command
V2.1	2018-08-13	Update +ZCELLLOCK, +ZFTPPUT command Add +ZHTTPSGET, +ZHTTPSPOST commands
V2.2	2018-08-22	Upgrade +CFUN parameter explain, Update response format of +ZECMCALL Delete default value of +CREG and +CEREG
V2.3	2019-06-26	Add FTPs, MQTT, FILE,SSL related commands, +ZGXTRA,+HTTPSAVE,+ZIPUNACK,+ZIPALIVE, +ZPOWESAVE,+ZMQCFG,+ZCPWR,+ZHTTPCFG,+BANDEX,+ZGNMEAREQ,+ZSRVRSP Update commands +CSQ,+CMUX,MQTT, +ZMQCFG,+ZMQCON,+ZIPOPEN,+ZCDS Delete +ZGPSEVENT,+ZCOMDEL

V2.4	2020-05-15	Add command of ZAUTOSLEEP,+CCED,+ZRSPEXT, $ZFTPTO Add command of +ZMODESET, +ZRTRFST, +ZGSWCHECK,+ZDATAROAM Update file relative commands Update +ZGPSAPN,+ZRTRFST, +ZMQNEW
V2.5	2020-07-03	Add command of ZIPSERPORT Update +zgpsr, +CNMI
	2020-08-19	Add MQTT related error code, +ZSETDIV Update +ZHTTPPOST
	2021-01-21	Update +ZWAKEUPSMS
	2021-09-26	Update +ZRSPEXT
V2.6	2022-02-08	Add commands of FTP FOTA Delete &C,&D,&S
V2.7	2022-08-18	Update FOTA

Safety Information

The following safety precautions must be observed during all phases of the operation, such as usage, service or repair of any cellular terminal or mobile incorporating ME3630 module. Manufacturers of the cellular terminal should send the following safety information to users and operating personnel and to incorporate these guidelines into all manuals supplied with the product. If not so, GOSUNCN does not take on any liability for customer failure to comply with these precautions.

	Full attention must be given to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a hands free kit) cause distraction and can lead to an accident. You must comply with laws and regulations restricting the use of wireless devices while driving.
	Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Consult the airline staff about the use of wireless devices on boarding the aircraft, if your device offers a Airplane Mode which must be enabled prior to boarding an aircraft.
	Switch off your wireless device when in hospitals or clinics or other health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.
	GSM cellular terminals or mobiles operate over radio frequency signal and cellular network and cannot be guaranteed to connect in all conditions, for example no mobile fee or an invalid SIM card. While you are in this condition and need emergent help, please remember using emergency call. In order to make or receive call, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength.
	Your cellular terminal or mobile contains a transmitter and receiver. When it is on, it receives and transmits radio frequency energy. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.
	In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as your phone or other cellular terminals. Areas with potentially explosive atmospheres including fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles such as grain, dust or metal powders.

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1. Introduction

1.1. Scope

This document is aimed at providing a detailed specification and a comprehensive listing as a reference for the whole set of AT command.

Note: All the AT commands follow the Related Documents(3GPP (R99) TS27.005 and TS27.007) is as below:

- **3GPP TS 27.007 specification and rules**

http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/

- **3GPP TS 27.005 specification and rules**

http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/

1.2. Audience

Readers of this document should be familiar with GOSUNCN modules and their ease of controlling by means of AT Commands.

1.3. Document Organization

This document contains the following chapters:

Chapter 1: “Introduction” provides a scope for this document, target audience, contact and support information, and text conventions.

Chapter 2: Introduction to AT Commands

Chapter 3~last: “AT Commands” The core of this reference guides.

2. Introduction to AT Commands

The following syntactical definitions apply:

<CR>Carriage return character is the command line and result code terminator character, which value, in decimal ASCII between 0 and 255, is specified within parameter S3. The default value is 13.

<LF> Linefeed character is the character recognized as line feed character. Its value, in decimal ASCII between 0 and 255, is specified within parameter S4. The default value is 10. The line feed character is output after carriage return character if verbose result codes are used (V1 option used) otherwise, if numeric format result codes are used (V0 option used) it will not appear in the result codes.

<...>Name enclosed in angle brackets is a syntactical element. They do not appear in the command line.

[...] Optional subparameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in AT commands which have a Read command, new value equals to its previous value. In AT commands which do not store the values of any of their subparameters, and so have not a Read command, which are called action type commands, action should be done on the basis of the recommended default setting of the subparameter.

2.1. AT Command Syntax

The syntax rules followed by GOSUNCN implementation of GSM/WCDMA/LTE commands are very similar to those of standard basic and extended AT commands.

There are two types of extended command:

- Parameter type commands. This type of commands may be “set” (to store a value or values for later use), “read” (to determine the current value or values stored), or “test” (to determine ranges of values supported). Each of them has a “test” command (trailing =?) to give information about the type of its subparameters; they also have a “read” command (trailing?) to check the current values of subparameters.
- Action type commands. This type of command may be “executed” or “tested”.

NOTE: The response to the Test Command (trailing =?) may be changed in the future by GOSUNCN to allow the description of new values/functionalities.

If all the sub-parameters of a parameter type command +CMD are optional, issuing AT+CMD=<CR> causes the OK result code to be returned and the previous values of the omitted sub-parameters to be retained.

2.1.1. String Type Parameters

A string either enclosed between quotes or not, is considered to be a valid string type parameter input. According to V25.ter, space characters are ignored on the command line and may be used freely for formatting purposes, unless they are embedded in numeric or quoted string constants; therefore a string containing a space character has to be enclosed between quotes to be considered a valid string type parameter (e.g. typing **AT+COPS=1,0,”A1”** is the same as typing **AT+COPS=1,0,A1**; typing **AT+COPS=1,0,”A BB”** is different from typing **AT+COPS=1,0,A BB**).

A small set of commands requires always writing the input string parameters within quotes: this is explicitly reported in the specific descriptions.

2.1.2. Command Lines

A command line is made up of three elements: the **prefix**, the **body** and the **termination character**. The **command line prefix** consists of the characters “**AT**” or “**at**”, or, to repeat the execution of the previous command line, the characters “**A/**” or “**a/**”. The **termination character** may be selected by a user option (parameter S3), the default being **<CR>**.

The basic structures of the command line are:

ATCMD1<CR> where **AT** is the command line prefix, **CMD1** is the body of a **basic command** (nb: the name of the command never begins with the character "+") and <**CR**> is the command line terminator character

ATCMD2=10<CR> where 10 is a subparameter

AT+CMD1; +CMD2=, ,10<CR> These are two examples of **extended commands** (nb: the name of the command always begins with the character "+"). They are delimited with semicolon. In the second command the subparameter is omitted.

+CMD1?<CR> This is a Read command for checking current subparameter values

+CMD1=?<CR> This is a test command for checking possible subparameter values

These commands might be performed in a single command line as shown below:

ATCMD1 CMD2=10+CMD1; +CMD2=, ,10;+CMD1?;+CMD1=?<CR>anyway it is always preferable to separate into different command lines the basic commands and the extended commands. Furthermore it is suggested to avoid placing several action commands in the same command line, because if one of them fails, then an error message is received but it is not possible to argue which one of them has failed the execution.

If command **V1** is enabled (verbose responses codes) and all commands in a command line has been performed successfully, result code **<CR><LF>OK<CR><LF>** is sent from the TA to the TE, if subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **<CR><LF>ERROR<CR><LF>** is sent and no subsequent commands in the command line are processed. If command **V0** is enabled (numeric responses codes), and all commands in a command line has been performed successfully, result code **0<CR>** is sent from the TA to the TE, if subparameter values of a command are not accepted by the TA or command itself is invalid, or command cannot be performed for some reason, result code **4<CR>** and no subsequent commands in the command line are processed.

In case of errors depending on ME operation, **ERROR (or 4)** response may be replaced by +CME **ERROR: <err>** or **+CMS ERROR: <err>**.

NOTE: The command line buffer accepts a maximum of 80 characters. If this number is exceeded none of the commands will be executed and TA returns ERROR.

2.1.3. Information Responses and Result Codes

The TA response, in case of verbose response format enabled, for the previous examples command line could be as shown below:

Information response to +CMD1? <CR><LF>+CMD1:2,1,10<CR><LF>

Information response to +CMD1=? <CR><LF>+CMD1: (0-2),(0,1),(0-15)<CR><LF>

Final result code <CR><LF>OK<CR><LF>

Moreover there are other two types of result codes:

result codes that inform about progress of TA operation (e.g. connection establishment **CONNECT**)

result codes that indicate occurrence of an event not directly associated with issuance of a command from TE

2.1.4. Command Response Time-Out

Every command issued to the GOSUNCN modules returns a result response if response codes are enabled (default). The time needed to process the given command and return the response varies, depending on the command type. Commands that do not interact with the SIM or the network, and involve only internal set up settings or readings, have an immediate response, depending on SIM configuration(e.g., number of contacts stored in the phonebook, number of stored SMS), or on the network the command may interact with.

In the table below are listed only the commands whose interaction with the SIM or the network could lead to long response timings. When not otherwise specified, timing is referred to set command.

For SMS writing and reading related commands, timing is referred to commands issued after phonebook sorting is completed.

For DTMF sending and dialing commands timing is referred to module registered on network (“AT+CREG?” answer is “+CREG: 0, 1” or “+CREG: 0, 5”).

Command	Estimated maximum time to get response(Seconds)
+COPS	180 (For test command)
+CLCK	180
+CPWD	180
+CPIN	5
+CPBW	5
+CSCA	5
+CSAS	5
+CRES	5
+CMGS	180 after CTRL-Z; 1 to get ‘>’ prompt
+CMSS	180 after CTRL-Z; 1 to get ‘>’ prompt
+CMGW	5 after CTRL-Z; 1 to get ‘>’ prompt
+CMGD	5 for single SMS deletion, and 25 for 50 SMS deletion
+CMGR	5
+CMGL	7
+CGACT	180
+CGATT	180
+COPN	45
+CRSM	**5**

2.1.5. Command Issuing Timing

The chain Command -> Response shall always be respected and a new command must not be issued before the module has terminated all the sending of its response result code (whatever it may be).

This applies especially to applications that “sense” the OK text and therefore may send the next command before the complete code <CR><LF>OK<CR><LF> is sent by the module. It is advisable anyway to wait for at least 20ms between the end of the reception of the response and the issue of the next AT command. If the response codes are disabled and therefore the module does not report any response to the command, then at least the 20ms pause time shall be respected.

During command mode, due to hardware limitations, under severe CPU load the serial port can lose some characters if placed in auto-bauding at high speeds. Therefore, if you encounter this problem fix the baud rate with +IPR command.

2.2. Setting Commands Saving

The table below list all the set command, which take effect after restart or once setting, and which is still take effect after restart.

Set commands	take effect once setting?(Y/N) N:take effect after restarting Y:take effect once setting	Save after restart(Y/N/NA) NA:Not applicable Y:Save after restart N:Parameter settings in the command are not saved after the module is powered off.

ATS5	Y	N
ATE	Y	N
AT+CFUN	Y	N
AT+CMEE	Y	N
AT+ZUFLOW	Y	N
AT+IPR	Y	Y
AT+IFC	Y	N
AT+CLCK	Y	Y
AT+CPWD	Y	NA
AT+CPIN	Y	NA
AT+CMGF	Y	Y
AT+CSMP	Y	N
AT+CNMI	Y	N
AT+CPMS	Y	N
AT+ZSPWAKEUP	Y	Y
AT+ZWAKEUPSMS	Y	Y
AT+CREG	Y	N
AT+CEREG	Y	N
AT+COPS	Y	N
AT+CTZU	Y	Y
AT+CTZR	Y	N
AT+ZSNT	Y	N
AT+ZSNTE	Y	Y
AT+ZBAND	N	Y
AT+CGDCONT	Y	Y
AT$QCPDPP	Y	Y
AT+ZGMODE	Y	Y
AT+ZGFIXRATE	Y	Y
AT+ZGQOS	Y	Y
AT+ZGURL	Y	Y
AT+ZGPSAPN	Y	Y
AT+ZGPSR	Y	N
AT+ZSWITCH	N	Y
AT+ZGPIO	Y	N
AT+ZADSET	Y	N
AT+ZSDT	N	Y
AT+ZIPCFG?	**Y**	**Y**

2.3. AT Commands References

"3GPP TS 27.005 specification"

"3GPP TS 27.007 specification"

"ITU-T V.25ter specification"

3. Identification Commands

3.1. I Request identification information

This command causes the DCE to transmit one or more lines of information text, such as manufacturer, product name, software revision, IMEI etc., determined by the manufacturer, followed by a final result code.

Command	Response
I<val>	<CR><LF>Manufacturer:<manufacturer><CR><LF> <CR><LF>Model:<model><CR><LF> <CR><LF>Revision:<revision><CR><LF> <CR><LF>ESN:<IMEI><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<manufacturer>:manufacturer

<model>:Module name

<revision>: Firmware information

<SVN>: software version number(ME3630-E series module has no SVN response)

<IMEI>:IMEI

3.2. +GMI Request manufacturer identification

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the manufacturer.

Command	Response
+GMI	<CR><LF><manufacturer><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+GMI=?	<CR><LF>OK<CR><LF>

Parameter

<manufacturer>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

3.3. +CGMI Request manufacturer identification

Execution command returns the device manufacturer identification code without command echo.

Command	Response
+CGMI	<CR><LF><manufacturer><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

+CGMI=?	<CR><LF>OK<CR><LF>

Parameter

<manufacturer>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

3.4. +GMM Request model identification

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device.

Command	Response
+GMM	<CR><LF><model><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+GMM=?	<CR><LF>OK<CR><LF>

Parameter

<model>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Example

```
AT+GMM
ME3630

OK
```

3.5. +CGMM Request model identification

Execution command returns the device model identification code without command echo.

Command	Response
+CGMM	<CR><LF><model><CR><LF> <CR><LF>OK<CR><LF> <CR><LF>+CME ERROR: <err><CR><LF>
+CGMM=?	<CR><LF>OK<CR><LF>

Parameter

<model>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Example

```
AT+CGMM
ME3630

OK
```

3.6. +GMR Request revision identification

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device.

Command	Response
+GMR	<CR><LF><revision><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<revision>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Example

```
AT+GMR
ME3630U1AV1.0B04

OK
```

3.7. +CGMR Request revision identification

Execution command returns device software revision number without command echo.

Command	Response
+CGMR	<CR><LF><revision><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGMR=?	<CR><LF>OK<CR><LF>

Parameter

<revision>: the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Example

```
AT+CGMR
ME3630U1AV1.0B04

OK
```

3.8. +GSN Request IMEI

This command is used to request IMEI

Command	Response
+GSN	<CR><LF><sn><CR><LF> <CR><LF>OK<CR><LF> <CR><LF>+CME ERROR: <err><CR><LF>
+GSN=?	<CR><LF>OK<CR><LF>

Parameter

<sn>: IMEI (International Mobile Equipment Identity)

Example

```
AT+GSN
```

```
356118040008583

OK
```

3.9. +CGSN Request IMEI

This command is used to request IMEI

Command	Response
+CGSN	<CR><LF><sn><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGSN=?	<CR><LF>OK<CR><LF>

Parameter

<sn>:IMEI (International Mobile Equipment Identity)

Example

```
AT+CGSN
356118040008583     // (or 0xA000001FA43F9C0)

OK
```

3.10. +CIMI Request international mobile subscriber identity

This command is used to request IMSI.

Command	Response
+CIMI	<CR><LF><IMSI><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CIMI=?	<CR><LF>OK<CR><LF>

Parameter

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

Example

```
AT+CIMI
460199100106272

OK
```

3.11. +ZGETICCID Get the ICCID of (U)SIM

This command is used to request the ICCID of (U)SIM.

Command	Response
+ZGETICCID	<CR><LF>+ZGETICCID: <iccid><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<iccid>: ICCID of (U)SIM

Example

```
AT+ZGETICCID
+ZGETICCID: 86860460020123456381

OK
```

3.12. +ZPCB Check PCB Version

This command is used to check PCB Version.

Command	Response
+ZPCB?	<CR><LF>+ZPCB: <PCB version><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<PCB version>: PCB No., the string shall not exceed 64 characters

Example

```
AT+ZPCB?
+ZPCB: ME3630MB_B

OK
```

4. General Commands

4.1. S5 Command Line Editing Character

Set command sets the value of the character recognized by the device as a request to delete from the command line the immediately preceding character.

Command	Response
S5=<val>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
S5?	<CR><LF><val><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<val>:0 to 127, Set command line editing character to this value, factory default value is 8 (ASCII BS). The value can be available from the command AT&V.

Example

```
ATS5=8
OK
```

4.2. &F Set to Factory-defined Configuration

This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria.

Command	Response
&F[<n>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

For LTE, the execution of AT&F commands will restored all AT commands, includes 3GPP AT commands and GOSUNCN defined AT commands, to the default value predefined in AT command table.

AT Command Settings storable with AT&F:

AT Command	Factory Defaults
ATE	<val> = 1, AT command default value
ATQ	<val> = 0, AT command default value
ATV	<val> = 1, AT command default value
AT&C	<n> = 1, AT command default value
AT&D	<n> = 2, AT command default value
AT&S	<n> = 0, AT command default value
+IFC	<2> [,<2>] , AT command default value
+CREG	<n> = 0 , AT command default value
+CGREG	<n> = 0 , AT command default value
+CMEE	<n> = 0 , AT command default value

Parameter

<n>:

0: Set parameters to factory defaults. if parameter <n> is omitted, the command has the same behavior as AT&F0

Example

```
AT&F
OK
```

4.3. &V Display Current Configuration

This command instructs the DCE to get all parameters values specified by the manufacturer, and it will returns the setting of several AT command parameters applicable to the current operating mode, including the single-letter AT command parameters which are not readable otherwise.

Command	Response
&V	<CR><LF>OK<CR><LF>

Example

```
AT&V
OK
```

4.4. &W Store AT command Setting to User Defined Profile

This command instructs the modem to store the current AT command settings to a user defined profile in non-volatile memory. The AT command settings will automatically be restored from the user defined profile during power-up or if ATZ is used. AT&F restores AT command factory default settings. Hence, until first use of AT&W, ATZ works as AT&F. A list of parameters stored to the user profile can be found.

Command	Response
&W	<CR><LF>OK<CR><LF>

For LTE module, the execution of AT&W command will store the current value of the following AT commands to the NV only.

AT Command	Stored parameters
ATE	<val>
ATQ	<val>
ATV	<val>
AT&C	<n>
AT&D	<n>
AT&S	<n>
+IFC	<DCE_by_DTE> [,<DTE_by_DCE>]

Example

```
AT&W
OK
```

4.5. Z Reset to default configuration

This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If the DCE is connected to the line, it is disconnected from the line, terminating any call in progress.

Command	Response
Z<val>	<CR><LF>OK<CR><LF>

Parameter

For LTE Module, the execution of ATZ command will restore all AT commands to the default value predefined in AT command table

except the following AT commands. The following AT commands will be got from the NV storage value set by AT&W.

AT Command Settings storable with ATZ:

AT Command	Restored From
ATE	NV
ATQ	NV
ATV	NV
AT&C	NV
AT&D	NV
AT&S	NV
+IFC	NV

NOTE: if parameter <val>is omitted, the command has the same behavior as ATZ0. The define value is 0, and the value can be available from the command AT&V or AT\S.

Example

```
ATZ
OK
```

4.6. O Return to Online Data State

Causes the DCE to return to online data state and issue a CONNECTor CONNECT<text> result code.

Command	Response
O<val>	<CR><LF>CONNECT<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<val>: 0 Return to online data state from online command state. Also used to retrain after a modem-on-hold transaction or to reconnect to a modem that has been placed in an on-hold state per V.92.

Example

```
ATO
CONNECT
```

4.7. Q Result Code Suppression

Set command enables or disables the result codes. Information text transmitted in response to commands is not affected by the setting of this parameter.

Command	Response
Q<val>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<val>:

0 DCE transmits result codes.

1 result codes are suppressed and not transmitted.

NOTE: the define value is 0, ATQ means ATQ0, and the value can be available from the command AT&V.

Example

```
ATQ1
OK
```

4.8. E Command Echo

The setting of this parameter enables/disables the command echo.

Command	Response
E[<val>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<val>:

0 DCE disables command echo. (factory default)

1 DCE enables command echo , hence command sent to the device are echoed back to the DTE.

NOTE: if parameter <val> is omitted, the command has the same behavior as ATE1.

Example

```
ATE0
OK
        //Input AT, but the device disable command echo
OK
```

4.9. ATV DCE Response Format

The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.

Command	Response
V<val>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<val>:

0 DCE transmits limited headers and trailers and numeric text.

1 DCE transmits full headers and trailers and verbose response text.

NOTE: if parameter <val> is omitted, the command has the same behavior as ATV0. The define value is 1, and the value can be available from the command AT&V or AT\S.

4.10. +CFUN Set Phone Functionality

Set command selects the level of functionality <fun> in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, MT resetting with <rst> parameter may be utilized.

NOTE: issuing AT+CFUN=4[,0] actually causes the module to perform either a network deregistration and a SIM deactivation.

Test command returns values supported as a compound value.

Command	Response
+CFUN=[<fun>[,<rst>]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CFUN?	<CR><LF>+CFUN: <fun><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CFUN=?	<CR><LF>+CFUN: (list of supported <fun>s), (list of supported <rst>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<fun>:

0 minimum functionality (MT before setting must not 7)

1 full functionality (MT before setting must not 7) (factory default)

4 disable phone both transmit and receive RF circuits (MT before setting must not 7)

5 Factory test mode

6 Reset module

7 Offline Mode, in this status, the NV is lost, and the module can't register to network, we recommend to restore the NV.

<rst>:

0 no need to reset the module to make <fun> effect.

1 need to reset the module to make <fun> effect.

NOTE: This shall be always default 0 when <rst> is not given

Example

```
AT+CFUN?
+CFUN: 1

OK
```

4.11. +CSCS Select TE Character Set

Set 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.

When TA-TE interface is set to 8-bit operation and used TE alphabet is 7-bit, the highest bit shall be set to zero.

NOTE 1 : It is manufacturer specific how the internal alphabet of MT is converted to/from the TE alphabet.

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

Command	Response
+CSCS=[<chset>]	<CR><LF>OK<CR><LF>

+CSCS?	<CR><LF>+CSCS: <chset><CR><LF> <CR><LF>OK<CR><LF>
+CSCS=?	<CR><LF>+CSCS: (list of supported <chset>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<chset>: (conversion schemes not listed here can be defined by manufacturers):

"GSM" GSM 7 bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF) problems

NOTE 2: If MT is using GSM 7 bit default alphabet, its characters shall be padded with 8th bit (zero) before converting them to hexadecimal numbers (i.e. no SMS-style packing of 7-bit alphabet).

"IRA" international reference alphabet (ITU-T T.50)

"UCS2" 16-bit universal multiple-octet coded character set (ISO/IEC10646); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99

Example

```
AT+CSCS?
+CSCS: "IRA"

OK
AT+CSCS=?
+CSCS: ("IRA",”GSM”,"UCS2")

OK
```

4.12. +CMEE Report Mobile Termination Error

Set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err>final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Read command returns the current value of subparameter <n>.

Test command returns values supported as a compound value.

Command	Response
+CMEE=[<n>]	<CR><LF>OK<CR><LF>
+CMEE?	<CR><LF>+CMEE: <n><CR><LF> <CR><LF>OK<CR><LF>
+CMEE=?	<CR><LF>+CMEE: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n>:

0 disable +CME ERROR: <err> result code and use ERROR instead (default value)

1 enable +CME ERROR: <err> result code and use numeric <err> values

2 enable +CME ERROR: <err> result code and use verbose <err>values

Example

```
AT+CMEE=0       (+CME ERROR shall not be used)
```

```
OK
AT+CGMI
ERROR
AT+CMEE=1        (use numeric <err>)
OK
AT+CGMI
+CME ERROR: 1
AT+CMEE=2        (use verbose <err>)
OK
AT+CGMI
+CME ERROR: no connection to phone
```

4.13. +CME ERROR ME Error Result Code

This is NOT a command; it is the error response to +Cxxx 3gpp TS 27.007 commands.

Command	Response
	<CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<err>: error code can be either numeric or verbose (see +CMEE).

The possible values of <err> are reported in the table:

Numeric Format	Verbose Format
General error:	
0	Phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	Operation not allowed
4	Operation not allowed
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 require
20	Memory full
21	Invalid index

22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timer-out
32	Network not allowed -emergency calls only
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	corporate personalization PUK required
48	Hidden key required (NOTE: This key is required when accessing hidden phonebook entries.)
49	EAP method not supported
50	Incorrect parameters
100	unknown
GPRS-related errors	
	Errors related to a failure to perform an Attach
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
	Errors related to a failure to Activate a Context
132	service option not supported (#32)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
149	PDP authentication failure
	Other GPRS errors
150	invalid mobile class
148	unspecified GPRS error

	VBS / VGCS and eMLPP -related errors
151	VBS/VGCS not supported by the network
152	No service subscription on SIM
153	No subscription for group ID
154	Group Id not activated on SIM
155	No matching notification
156	VBS/VGCS call already present
157	Congestion
158	Network failure
159	Uplink busy
160	No access rights for SIM file
161	No subscription for priority
162	operation not applicable or not possible

5. Serial Interface Control Commands

5.1. +IFC DTE-DCE Local Flow Control(not support yet)

This set command is used to control the operation of local flow control between the DTE and DCE during the data state. It accepts two numeric subparameters:

<DCE_by_DTE>, which specifies the method to be used by the DTE to control the flow of received data from the DCE;

<DTE_by_DCE>, which specifies the method to be used by the DCE to control the flow of transmitted data from the DTE.

Command	Response
+IFC=[<DCE_by_DTE> [,<DTE_by_DCE>]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+IFC?	<CR><LF>+IFC: <DCE_by_DTE>,<DTE_by_DCE><CR><LF> <CR><LF>OK<CR><LF>
+IFC=?	<CR><LF>+IFC:(list of supported <DCE_by_DTE> values),(list of supported <DTE_by_DCE> values)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<DCE_by_DTE>	Description
0	None flow control
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
4 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
<DTE_by_DCE>	**Description**
0	None flow control
1	DC1/DC3 on circuit 104
2	Circuit 106 (Clear to Send/Ready for Sending)
3 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
NOTE: DC1 is IA5 1/1; DC3 is IA5 1/3.	

NOTE: the value can be available from the command AT&V. AT command default value is <2> [,<2>]

Example

```
AT+IFC=?
+IFC: (0-3),(0-2)

OK
```

5.2. +IPR Fixed DTE Rate

Set command specifies the UARTs data rate at which the DCE will accept commands. And the set value will be saved after restart.

Command	Response
+IPR=<rate>	<CR><LF>OK<CR><LF>
+IPR?	<CR><LF>+IPR: <rate><CR><LF> <CR><LF>OK<CR><LF>
+IPR=?	<CR><LF>+IPR:(list of supported autodetectable rate values)[,(list of fixed-only rate values)]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<rate: >The<rate>value specified should be the rate in bits per second at which the DTE-DCE interface should operate, e.g., "19200" or "115200".

The baud rate supported by module is1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600, 1000000,1500000, 2000000,2500000,3000000,3500000.

Example

```
AT+IPR?
+IPR: 115200

OK
AT+IPR=?
+IPR:(1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1000000,1500000,2000000,2500000,3000000,3500000)

OK
```

5.3. +ZUFLOW 4-wires UART flow control command

4-wires UART flow control command.

Command	Response
+ZUFLOW=<flag>	<CR><LF>OK<CR><LF> or <CR><LF>+ERROR<CR><LF>
+ZUFLOW?	<CR><LF>+ZUFLOW: <flag><CR><LF> <CR><LF>OK<CR><LF>
+ZUFLOW=?	<CR><LF>+ZUFLOW: (0,1)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<flag>:

1 Enable 4-wires UART flow control command

0 Disable 4-wires UART flow control command (default)

5.4. +CMUX Enable CMUX(Multiplexing mode)

This command is used to enable/disable the 3GPP TS 27.010 [45] multiplexing protocol control channel. The AT command sets parameters for the Control Channel. If the parameters are left out, the default value is used.

Read command returns the current settings.

Test command returns the supported parameters as compound values.

This command is supported by firmware of or above ME3630A1CV1.0B03 currently

Command	Response
AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]	<CR><LF>OK<CR><LF>
AT+CMUX?	<CR><LF>+CMUX: <mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k><CR><LF> <CR><LF>OK<CR><LF>
AT+CMUX=?	<CR><LF>+CMUX: (0),(0),(1-8),(1-2048),(1-255),(0-100),(2-255),(1-255),(1-7)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>: integer type (multiplexer Transparency Mechanism), can only be set to 0 now.

0 Basic option (default value)

1 Advanced option

<subset>: integer type. Not support yet, can only be set to 0 now.

0 UIH frames used only(default value)

1 UI frames used only

2 I frames used only

<port_speed>: integer type (transmission rate). The default value is 5. It can be set to 1-8, however, this value is not used now, the transmission rate will remain the value when you send this command.

1 9600 bit/s

2 19200 bit/s

3 38400 bit/s

4 57600 bit/s

5 115200 bit/s (default value)

6 230400 bits/s

7 460800bit/s

8 921600bit/s

<N1>: Integer type (maximum frame size), default value 31. At present, it can be set to 1-2048.

<T1>: Integer type (acknowledgement timer in units of ten milliseconds), default value 10(100ms),it can be set to 1-255, but have no effect now.

<N2>: Integer type(maximum number of re-transmissions), default value 3, it can be set to 0-100, but have no effect now.

<T2>: Integer type(response timer for the multiplexer control channel in units of ten milliseconds), default value 30, it can be set to 2-255, but have no effect now.

<T3>: Integer type(wake up response timer in seconds), default value 10, it can be set to 1-255, but have no effect now.

<k>: Integer type(window size, for Advanced option with Error-Recovery Mode), default value 2, it can be set to 1-7, but have no effect now.

Example

```
AT+CMUX=0
OK
AT+CMUX?
+CMUX: 0,0,5,31,10,3,30,10,2
OK
```

5.5. +ZCOMWRT write upgrade file command

Normally, the module version is updated via USB port, but if no USB port is connected in use, it cannot be upgraded via USB port. The serial port upgrade function provides a method of version upgrade via the serial port of the module to makes up for the above defect. The serial port upgrade function includes two main operations: one is to transfer the upgrade file the module via the serial port, and the other one is to upgrade through the serial port notification module.

ZCOMWRT instruction is used to transfer the upgrade file to the module. This instruction can only be executed through the serial port, and an unknown error will occur in the case of USB port.

An integer parameter is required to send this instruction, which indicates the length of the file to be sent. After receiving the instruction, the module will return ">" (a greater than-sign and a space, the same below), and then file data can be sent to the module. When the data sent reaches the specified length, the module returns OK

Note: the ">" returned by the module means that the module is ready to receive the file data internally, so you must wait for the module to return ">" before sending the file data, otherwise, the data sent in the first place will be lost, and eventually result in the failure of the upgrade.

Command	Response
+ZCOMWRT=<file_len><CR><file_data>	<CR><LF>ERROR<CR><LF> or <CR><LF>OK<CR><LF>
+ZCOMWRT=?	<CR><LF>OK<CR><LF>

Parameter

<file_len>: An integer in bytes means the size of the file to be transferred. This command generally does not limit the size of delta-package, and it can upload a complete delta-package.

Note:

According to different serial port rates and different subcontract sizes, the execution of write subcontract instructions takes a certain time, for example, the upload file size: 5888000byte, baud rate: 115200bps, and the time is about 511 seconds.

<file_data>: Upgrade file data

Example

Send: AT+ZCOMWRT=10
Receive: >
Send: 1234567890
Receive: OK

Note: assume that the upgrade file has only 10 bytes which is 1234567890

5.6. +ZCOMUPDATE Serial port start command

ZCOMUPDATE command is used to initiate the serial port upgrade. Before sending this instruction, please make sure that the upgrade file has been transferred to the module, otherwise the upgrade will not start even if the command returns OK.

Command	Response
+ZCOMUPDATE	<CR><LF>OK<CR><LF>
+ZCOMUPDATE=?	<CR><LF>OK<CR><LF>

Enter AT+ZCOMUPDATE to start the upgrade directly. When the module starts the operation of the upgrade, it will restart twice. After the second restart of the device, the normal USB port will be enumerated, and the UART port will report +ZREADY. AT this point you

can open the module AT port, send instructions to see the upgrade results.

The following will be reported during the upgrade process to inform the upper level of the current upgrade status. The status report is as follows:

1. +FOTAIND: UPDATING Firmware is being updating, which is reported after OK returned by +ZCOMUPDATE
2. +ZREADY module has been restarted and the port was enumerated successfully. The instruction will be 3-6 minutes after +FOTAIND: UPDATING
3. +FOTAIND: SUCCESS_END upgrade process is over and successfully upgraded, which is generally reported about 30 seconds after +ZREADY
4. +FOTAIND: FAIL_END upgrade process ended and failed. The reason is unknown, generally, it is a delta-package error, and this instruction is generally reported about 30 seconds after +ZREADY.

Example

```
When the upgrade is successful:
AT+ZCOMWRT=6359040
>                                    //the delta package need to be sent
OK

AT+ZCOMUPDATE
  OK
+FOTAIND: UPDATING ......          //the module will restart twice after UPDATING reported

+ZREADY                              // The module restart

+FOTAIND: SUCCES_END               // upgrade process is over and successfully upgraded
AT+ZVN
ME3630C2BV2.0B05 [Jan 23 2019 16:52:02]
OK

When the upgrade fails:
AT+ZCOMUPDATE
OK
+FOTAIND: UPDATING ......
+ZREADY
+FOTAIND: FAIL_END
```

6. SIM Related Commands

6.1. +CLCK Facility Lock

Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Call barring facilities are based on GSM/UMTS supplementary services (refer 3GPP TS 22.088).

Test command returns facility values supported as a compound value.

Command	Response
+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	<CR><LF>+CME ERROR: <err><CR><LF> or when <mode>=2 and command successful: <CR><LF>+CLCK: <status>[,<class1><CR><LF> <CR><LF> [+CLCK: <status>,<class2><CR><LF> [...]] <CR><LF>OK<CR><LF> Or <CR><LF>OK<CR><LF>
+CLCK=?	<CR><LF>+CLCK: (list of supported <fac>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<fac> values reserved by the present document:

"AB" All Barring services

"AC" All inComing barring services

"AG" All outGoing barring services

"AI" BAIC (Barr All Incoming Calls)

"AO" BAOC (Barr All Outgoing Calls)

"IR" BIC Roam (Barr Incoming Calls when Roaming outside the home country)

"OI" BOIC (Barr Outgoing International Calls)

"OX" BOIC exHC (Barr Outgoing International Calls except to Home Country)

"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued)

"FD"SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>).

"PN" Network Personalization

"PU" network sUbset Personalization

"PP" service Provider Personalization

"PC" Corporate Personalization

"PF" lock Phone to the very First inserted SIM/UICC card

NOTE: The parameters of "PN", "PU", "PP", "PC", "PS" and so on need the support of network service provide, so the setting command may return ERROR.

<mode>:defines the operation to be done on the facility

0 unlock

1 lock

2 query status

<status>: the current status of the facility

0 not active

1 active

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

<class> is a sum of integers each representing a class of information:

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

8 short message service

16 data circuit sync

32 data circuit async

64 dedicated packet access

128 dedicated PAD access

Example

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

OK
AT+CLCK="SC",1,"1234" //lock the SIM card
OK
AT+CLCK="SC",0,"1234"
OK
```

6.2. +CPWD Change Password

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

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

Command	Response
+CPWD=<fac>,<oldpwd>,<newpwd>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CPWD=?	<CR><LF>+CPWD: list of supported (<fac>,<pwdlength>)s<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<fac>:

"P2" SIM PIN2

Refer to command Facility Lock +CLCK for other values

<oldpwd>, <newpwd>: string type; <oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with

<pwdlength>

<pwdlength>: integer type maximum length of the password for the facility

Example

```
AT+CPWD=?
+CPWD:("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("IR",4),("OI",4),("OX",4),("SC",8),("P2",8)

OK
AT+CPWD="SC","1234","4321"
OK
AT+CPWD="SC","4321","12341234"
OK
AT+CPWD="SC","4321","1234"
+CME ERROR: incorrect password
AT+CPWD="SC","12341234","1234"
OK
```

6.3. +CPIN Enter PIN

Set command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the active application in the UICC (GSM or USIM) or SIM card.

Read command returns an alphanumeric string indicating whether some password is required or not.

Command	Response
+CPIN=<pin>[,<newpin>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CPIN?	<CR><LF>+CPIN: <code><CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CPIN=?	<CR><LF>OK<CR><LF>

Parameter

<pin>,<newpin>: string type values

<code> values reserved by the present document:

READY	MT is not pending for any password
SIM PIN	MT is waiting UICC/SIM PIN to be given
SIM PUK	MT is waiting UICC/SIM PUK to be given
PH-SIM PIN	MT is waiting phone-to-SIM/UICC card password to be given
PH-NET PIN	MT is waiting network personalization password to be given

Example

```
AT+CPIN?
+CPIN: READY
OK
```

6.4. +CRSM Restricted SIM Access

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. MT handles internally all SIM- MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1>and<sw2> parameters. Refer to subclause 3.1.2 for <err> values.

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

Test command returns the OK result code.

Command	Response
+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>]]]	<CR><LF>+CRSM: <sw1>,<sw2>[,<response>]<CR><LF> <CR><LF>OK<CR><LF> <CR><LF>+CME ERROR: <err><CR><LF>
+CRSM=?	<CR><LF>OK<CR><LF>

Parameter

<command> (command passed on by the MT to the SIM; refer GSM 11.11):

176 READ BINARY

178 READ RECORD

192 GET RESPONSE

214 UPDATE BINARY

220 UPDATE RECORD

242 STATUS

<fileid>: integer type; this is the identifier of a elementary data file on SIM. Mandatory for every command except STATUS

<P1>, <P2>, <P3>: integer type; parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 11.11

<data>: information which shall be written to the SIM (hexadecimal character format; refer +CSCS)

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

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

Example

```
AT+CRSM = 176,12258,0,0,10
+CRSM: 144,0,"98680090911109001080"

OK
```

6.5. +CNUM Subscriber Number

Action command returns the MSISDNs related to the subscriber ((if the phone number of the device has been stored in the SIM card). If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line.

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

Parameter

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

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

<type*x*>: type of address octet in integer format (refer GSM 04.08 subclause 10.5.4.7)

<speed>: Please refer to the value defined in the command of +CBST

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

0 asynchronous modem

1 synchronous modem

2 PAD Access (asynchronous)

3 Packet Access (synchronous)

4-5 Other service,(reserved)

<itc> (information transfer capability):

0 3,1kHz

1 UDI

Example

```
AT+CNUM
+CNUM: ,"18503039198",129

OK
```

6.6. +ZPINPUK Check PIN and PUK retry times

This command is used to check PIN and PUK left retry times.

Command	Response
+ZPINPUK=?	<CR><LF>+ZPINPUK:<pinnumber>,<puknumber><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<pinnumber>: PIN left retry times

<puknumber>: PUK left retry times

Example

```
AT+ZPINPUK=?
+ZPINPUK: 3,10

OK
```

7. SMS Commands

7.1. +CSMS Select Message Service

Execution command selects messaging service <service>. It returns the types of messages supported by the ME. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err>shall be returned. See chapter Message Service Failure Result Code for a list of<err>values.

Read command returns supported message types along the current service setting.

Test command returns a list of all services supported by the TA.

NOTE: The +CMGS, +CMGC can be influenced by the parameter <service>.

Command	Response
+CSMS=<service>	<CR><LF>+CSMS: <mt>,<mo>,<bm><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CSMS?	<CR><LF>+CSMS: <service>,<mt>,<mo>,<bm><CR><LF> <CR><LF>OK<CR><LF>
+CSMS=?	<CR><LF>+CSMS: (list of supported <service>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<service>:

0 3GPP TS 23.040 and 3GPP TS 23.041 , all type of messages supported. (Default Value)

1 3GPP TS 23.040 and 3GPP TS 23.041, the requirement of <service> setting 1 is mentioned under corresponding command descriptions) , all type of messages supported.

<mt> for mobile terminated messages,

0 type not supported

1 type supported

<mo> for mobile originated messages

0 type not supported

1 type supported

<bm> for broadcast type messages

0 type not supported

1 type supported

Example

```
AT+CSMS=1
+CSMS: 1,1,1

OK
AT+CMGF=1
OK
AT+CMGS="18891006239"
> this
```

```
+CMGS: 248,"12/11/05,14:45:39+32"

OK

//CSMS:0
AT+CSMS=0
+CSMS: 1,1,1

OK
AT+CMGS="18891006239"

> this

+CMGS: 249

OK
```

7.2. +CMGF Message Format

Set command selects input and output format of messages to use. <mode>indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages. Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Read command reports the current value of the parameter <mode>.

Test command returns supported modes as a compound value.

Command	Response
+CMGF=[<mode>]	<CR><LF>OK<CR><LF>
+CMGF?	<CR><LF>+CMGF: <mode><CR><LF> <CR><LF>OK<CR><LF>
+CMGF=?	<CR><LF>+CMGF: (list of supported <mode>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>:

0 PDU mode (default when implemented)

1 Text mode

Example

```
AT+CMGF=?
+CMGF: (0-1)

OK
AT+CMGF?
+CMGF: 0
```

```
OK
```

7.3. +CSCA Service Centre Address

Set command sets the Service Center Address to be used for module originated SMS transmissions. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

Read command reports the current value of the SCA.

Test command returns the OK result code.

Command	Response
+CSCA=<sca>[,<tosca>]	<CR><LF>OK<CR><LF>
+CSCA?	<CR><LF>+CSCA: <sca>,<tosca><CR><LF> <CR><LF>OK<CR><LF>
+CSCA=?	<CR><LF>OK<CR><LF>

Parameter

<sca>: String value. It indicates the SMSC number. The number is composed '*', '#' ,'+' and '0"~'9' The '+' must be the very beginning of the number. The number contains 20 characters at most.

<tosca>: Integer value. It indicates the number type, where "145" means an international call. For the specific values, see also the definition of the "type_addr" parameter in the SC number, as described in the section "Short message sending +CMGS".

Example

```
AT+CSCA?
+CSCA: "+8613010851500",145

OK
```

7.4. +CSMP Set Text Mode Parameters

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is selected (AT+CMGF=1).

It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0...255) or define the absolute time of the validity period termination (<vp> is a string). If TA supports the EVPF, see 3GPP TS 23.040, it shall be given as a hexadecimal coded string (refer e.g. <pdu>) with double quotes.

Read command reports the current setting in the format

Test command returns the OK result code.

Command	Response
+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	<CR><LF>OK<CR><LF>
+CSMP?	<CR><LF>+CSMP: <fo>,<vp>,<pid>,<dcs><CR><LF> <CR><LF>OK<CR><LF>
+CSMP=?	<CR><LF>OK<CR><LF>

Parameter

<fo>: depending on the command or result code: first octet of 3GPP TS 23.040 [3] SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format . you can refer to 3GPP TS 24.040 9.2.3.12 for detail.

Bit7: RP: Reply Path,

0 no set;

1 set

Bit6: UDHI, User Data Header Information,

0 no User Data Header Information

1 include User Data Header Information(used by long SMS)

Bit5: SRR, Status Report Request

1 need Status Report

0 no need Status Report

Bit4-bit3: VPF: Validity Period Format

00 Not present;

01 reserved

10 integer (standard)

11 Semi-Octet Represented

Bit2: RD : Reject Duplicates

0 receipt duplicates

1 Reject Duplicates

Bit1-bit0: MTI: Message Type Indicator

00 Deliver

01 Submit

02 SMS COMMAND and SMS STATUS REPORT.

<vp>: depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040 [3] TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>).

Validity period value: 0 to 143

(VP+1) x 5 minutes (up to 12 hours)

144 to 167

12 hours + (VP-143) x 30 minutes

168 to 196 (VP-166) x 1 day

197 to 255 (VP-192) x 1 week

<pid>: the default value is 0. 3GPP TS 03.40/23.040 TP-Protocol-Identifier in integer format.

<dcs>: depending on the command or result code: 3GPP TS 23.038 [2] SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format, 8 is UCS2 coding scheme.

Example

```
AT+CSMP=17,169,0,0
OK
AT+CSMP=25,169,0,0
ERROR
```

7.5. +CSCB Select Cell Broadcast Message Types (Not support yet)

Set command selects which types of CBMs are to be received by the ME.

Read command reports the current value of parameters <mode>, <mids> and <dcss>.

Test command returns supported modes as a compound value.

Command	Response
+CSCB=[<mode>[,<mids>[,<dcss>]]]	<CR><LF>OK<CR><LF>
+CSCB?	<CR><LF>+CSCB: <mode>,<mids>,<dcss><CR><LF> <CR><LF>OK<CR><LF>

+CSCB=?	<CR><LF>+CSCB: (list of supported <mode>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>:

0 message types specified in <mids> and <dcss> are accepted (Default Value)

1 message types specified in <mids> and <dcss> are rejected

<mids>: string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320-478,922"

<dcss>: string type; all different possible combinations of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. "0-3,5"

Example

```
AT+CSCB?
+CSCB: 0, "50,4370,0-65535",""

OK
AT+CSCB=?
+CSCB: (0-1)

OK
```

7.6. +CSAS Save Settings

Execution command saves active message service settings to a non-volatile memory. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore cannot be saved. See chapter Message Service Failure Result Code for <err> values.

Test command shall display the supported profile numbers for reading and writing of settings.

Command	Response
+CSAS[=<profile>]	<CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CSAS=?	<CR><LF>+CSAS: (list of supported <profile>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<profile>:

0 Settings specified in commands +CSCA +CSMP +CSCB are saved to NV.

Example

```
AT+CSAS=?
+CSAS: 0

OK
```

7.7. +CRES Restore Settings

Execution command restores message service settings from non-volatile memory to active memory. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are

restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore cannot be restored. See chapter Message Service Failure Result Code for<err>values.

Command	Response
+CRES[=<profile>]	<CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CRES=?	<CR><LF>+CRES: (list of supported <profile>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<profile>:

0 Settings specified in commands +CSCA +CSMP +CSCB are restored to NV.

Example

```
AT+CRES=?
+CRES: 0

OK
```

7.8. +CNMI New Message Indications to TE

Set command selects the procedure, how receiving of new messages from the network is indicated to the DTE.

If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err>values.

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

NOTE: Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMs and CBMs, and to define whether a message routed directly to TE should be acknowledged or not

Command	Response
+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	<CR><LF>OK<CR><LF> <CR><LF>+CMS ERROR: <err><CR><LF>
+CNMI?	<CR><LF>+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr><CR><LF> <CR><LF>OK<CR><LF>
+CNMI=?	<CR><LF>+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>- controls the processing of unsolicited result codes specified within this command

0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.

1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.

2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

3 Forward unsolicited result codes directly to the TE. TA-TE link specific in band technique used to embed result codes and data

when TA is in on-line data mode. (when TA is in on-line data mode, it seems need a MT call to enable TA report to TE)

<mt> -sets the result code indication routing for SMS-DELIVERs (the rules for storing received SMs depend on its data coding scheme, preferred memory storage (+CPMS) setting and this value; refer table 1;

0 No SMS-DELIVER indications are routed to the TE.

1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index>

2 SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code:

+CMT: [<alpha>],<length><pdu> (PDU mode enabled); or

+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<data> (text mode enabled)

If ME has its own display device then class 0 messages and messages in the message waiting indication group (discard message) may be copied to both ME display and to TE. In this case, ME shall send the acknowledgement to the network.

Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1.

3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.

<bm> -for CBMs (the rules for storing received CBMs depend on its data coding scheme, the setting of Select CBM Types (+CSCB) and this value):

0 No CBM indications are routed to the TE.

2 New CBMs are routed directly to the TE using unsolicited result code:

+CBM:<length><pdu> (PDU mode enabled); or

+CBM:<sn>,<mid>,<dcs>,<page>,<pages><data> (text mode enabled)

If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).

<ds>-for SMS-STATUS-REPORTs:

0 No SMS-STATUS-REPORTs are routed to the TE.

1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:(NOT SUPPORT)

+CDS:<length><pdu> (PDU mode enabled); or

+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

2 Reserved

<bfr>- defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled:

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

1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.

Example

```
AT+CNMI=2,1
OK
```

7.9. +CMGL List Messages

Execution command returns messages with status value <stat> from message storage <mem1> to the TE.Entire data units <pdu> are

returned for PDU mode. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, result code +CMS ERROR:<err> is returned. See chapter Message Service Failure Result Code for<err> values.

NOTE: If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs, SMS-STATUS-REPORTs and SMS-COMMANDs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.

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

Command	Response

+CMGL[=<stat>]	if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:
	<CR><LF>+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<data><CR><LF> [
	<CR><LF>+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<data><CR><LF> [...]]
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs:
	<CR><LF>+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st><CR><LF>
	[+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st><CR><LF>[...]]
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and SMS-COMMANDs:
	<CR><LF>+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>
	<CR><LF>+CMGL: <index>,<stat>,<fo>,<ct><CR><LF> [...]]
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and CBM storage:
	<CR><LF>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>
	<data><CR><LF> [
	<CR><LF>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>
	<data><CR><LF> [...]]
	<CR><LF>OK<CR><LF>
	
	if PDU mode (+CMGF=0) and command successful:
	<CR><LF>+CMGL: <index>,<stat>,[<alpha>],<length><pdu><CR><LF>
	[<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><pdu><CR><LF>
	[...]]
	<CR><LF>OK<CR><LF>
	
	otherwise:
	<CR><LF>+CMS ERROR: <err><CR><LF>

+CMGL=?	<CR><LF>+CMGL: (list of supported <stat>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<stat>:

(TEXT mode)

"REC UNREAD":

"REC READ"

"STO UNSENT"

"STO SENT"

"ALL"

(PDU mode)

0 REC UNREAD

1 REC READ

2 STO UNSENT

3 STO SENT

4 ALL

<ct>: integer type of 3GPP TS 03.40 TP-Command-Type

Example

```
AT+CMGF=1
OK
AT+CMGL="all"
+CMGL: 1,"REC READ","130********","",
abcdefg
+CMGL: 2,"REC READ","131********","",
abcdef
+CMGL: 3,"STO SENT","1331********",""
opqrxt
OK
```

7.10. +CMGR Read Message

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

If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for <err> values.

Test command returns the OK result code.

Command	Response

+CMGR=<index>	if text mode (+CMGF=1), command successful and SMS-DELIVER:
	<CR><LF>+CMGR:
	<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<data><CR><LF>
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and SMS-SUBMIT:
	<CR><LF>+CMGR:
	<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<data><CR><LF>
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and SMS-STATUS-REPORT:
	<CR><LF>+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st><CR><LF>

	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and SMS-COMMAND:
	<CR><LF>+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><cdata>]<CR><LF>
	<CR><LF>OK<CR><LF>
	
	if text mode (+CMGF=1), command successful and CBM storage:
	<CR><LF>+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><data><CR><LF>
	<CR><LF>OK<CR><LF>
	
	if PDU mode (+CMGF=0) and command successful:
	<CR><LF>+CMGR: <stat>,[<alpha>],<length><pdu><CR><LF>
	<CR><LF>OK<CR><LF>
	otherwise:
	<CR><LF>+CMS ERROR: <err><CR><LF>

+CMGR=?	<CR><LF>OK<CR><LF>

Parameter

<index>: stored SMS number

<stat>: SMS state

0 ”REC UNREAD” received unread message

1 ”REC READ” received read message

2 ”STO UNSENT” stored unsend message

3 ”STO SENT” stored sent message.

<alpha>: Corresponding name to <da> or <oa> on terminal device

<stat>: message state in memory unit

<oa>: Source number string of SMS

<da>: Target address string of SMS

<scts>: Time string of SMS service center

<length>:<data> length or TPDU bytes

<mn>: [0]~255 , integer type, 3GPP TS 24.040 TP-Message-Number

<ct>: integer type, 3GPP TS 03.40 TP-Command-Type

Example

```
AT+CMGF=1
OK
AT+CMGR=1
+CMGR: "REC UNREAD","133********",,
"04/02/25,12 :58 :04＋04"
ABCD
OK
```

7.11. +CMGS Send Message

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code. If sending fails

in a network or an ME error, result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

Command	Response

if text mode (+CMGF=1):
+CMGS=<da>[,<toda>]<CR>
text is entered<ctrl-Z/ESC>
 	
if PDU mode (+CMGF=0):
+CMGS=<length><CR>
PDU is given<ctrl-Z/ESC>
	if text mode (+CMGF=1) and sending successful:
	<CR><LF>+CMGS: <mr>[,<scts>]<CR><LF>
	<CR><LF>OK<CR><LF>
	
	if PDU mode (+CMGF=0) and sending successful:
	<CR><LF>+CMGS: <mr>[,<ackpdu>]<CR><LF>
	<CR><LF>OK<CR><LF>
	
	if sending fails:
	<CR><LF>+CMS ERROR: <err><CR><LF>

+CMGS=?	<CR><LF>OK<CR><LF>

Note: Sending can be cancelled by giving <ESC> character (IRA 27).

<ctrl-Z> (IRA 26) must be used to indicate the ending of PDU.

Parameter

<da>: Destination-Address

<toda>,<tooa>,<tosca>: 8 bytes Type of address for TP-Destination-Address, TP-Originating-Address, TP-Service- Centre-Address (when the initial character of <da> is +(IRA43), default value is 145, otherwise, its value is 129)

<data>: SMS information (less than 160 characters)

<mr>: message parameter

<scts>: Service Centre Time Stamp in time-string format. Can set (+CSMS<service>as 1, network supported) return <scts>

<length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded).

Example

```
AT+CMGS="10086"
> 1234
+CMGS: 242
OK
```

7.12. +CMSS Send Message from Storage

Execution command sends message with location value <index>from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR:<err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

Command	Response

+CMSS=<index>[,<da>[,<toda>]]	if text mode (+CMGF=1) and sending successful:
	<CR><LF>+CMSS: <mr>[,<scts>]<CR><LF>
	<CR><LF>OK<CR><LF>
	if PDU mode (+CMGF=0) and sending successful:

	<CR><LF>+CMSS: <mr>[,<ackpdu>]<CR><LF> <CR><LF>OK<CR><LF> if sending fails: <CR><LF>+CMS ERROR: <err><CR><LF>
+CMSS=?	<CR><LF>OK<CR><LF>

Parameter

<index>: stored SMS number

<da>: Destination-Address

<mr>: message parameter

<ackpdu>: optional,(when +CSMS<service> is 1， and network support),return <ackpdu>

Example

```
at+cmgw="18682013070"
> sss
+CMGW: 6
OK
at+cmss=6
+CMSS: 245

OK
```

7.13. +CMGW Write Message to Memory

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

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

Command	Response

if text mode (+CMGF=1):
+CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR>
text is entered<ctrl-Z/ESC>
 	
if PDU mode (+CMGF=0):
+CMGW=<length>[,<stat>]<CR>PDU is given<ctrl-Z/ESC>
	<CR><LF>+CMGW: <index>
	<CR><LF>
	<CR><LF>OK<CR><LF>
	or
	<CR><LF>+CMS ERROR: <err><CR><LF>

+CMGW=?	**<CR><LF>**OK**<CR><LF>**

Parameter

<oa/da>: Originating address/Destination address.

<length>: Message length. Integer type

<stat>:

PDU mode	Text mode	Explanation
0	"REC UNREAD"	Received unread messages
1	"REC READ"	Received read messages
2	"STO UNSENT"	Stored unsent messages

3 "STO SENT" Stored sent messages

4 "ALL" All messages

<index>: Index of message

Example

```
at+cmgf=1
OK
at+cmgw="10086"
> sdsd
+CMGW: 280
OK
```

7.14. +CMGD Delete Message

Execution command deletes message from preferred message storage<mem1>location<index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, result code +CMS ERROR: <err>is returned. See chapter Message Service Failure Result Code for <err> values.

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

Command	Response
+CMGD=<index>[,<delflag>]	<CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CMGD=?	<CR><LF>+CMGD: (list of supported <index>s)[,(list of supported <delflag>s)]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<index>: Index of message

<delflag>: an integer indicating multiple message deletion request as follows:

0 (or omitted) Delete the message specified in <index>

1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched

2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched

3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.

4 Delete all messages from preferred message storage including unread messages.

Example

```
at+cmgd=1,4
OK
```

7.15. +CMGC Send Command

Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of text/PDU (3GPP TS 23.040 TP-Command-Data) is done similarly as specified in command Send Message +CMGS, but for text mode the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets (refer +CMGS). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service>value is 1 and network supports) <scts>/<ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If

sending fails in a network or an ME error, final result code +CMS ERROR: <err>is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

For details about these parameters, please refer to 8.1 SMS parameter.

Note: this command can only support PDU format only, not support TEXT mode yet.

Command	Response

if text mode (+CMGF=1),can't support +CMGC command, if you want to send SMS in this mode, please use +CMGS command:
 	
if PDU mode (+CMGF=0):
+CMGC=<length><CR>
PDU is given<ctrl-Z/ESC>
	if PDU mode (+CMGF=0) and sending successful:
	<CR><LF>+CMGC: <mr>[,<ackpdu>]<CR><LF>
	<CR><LF>OK<CR><LF>
	
	if sending fails:
	<CR><LF>+CMS ERROR: <err><CR><LF>

+CMGC=?	<CR><LF>OK<CR><LF>

Parameter:

<da>: Destination-Address

<toda>,<tooa>,<tosca>: 8 bytes Type of address for TP-Destination-Address, TP-Originating-Address, TP-Service- Centre-Address (when the initial character of <da> is +(IRA43), default value is 145, otherwise, its value is 129)

<data>: SMS information (less than 160 characters)

<mr>: message parameter

<scts>: Service Centre Time Stamp in time-string format. Can set (+CSMS<service>as 1, network supported) return <scts>

<length>: Message Length, Integer type value indicating in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).

<mn>: [0]~255 Message number. 3GPP TS 24.040 TP-Message-Number integer format.

<ackpdu>: Can set (+CSMS<service>as 1, network supported) return <acjpdu>

Example

```
AT+CMGC=14
> 0891685109200905F011000B8181198016032F90011FF00
+CMGC: 251

OK
```

7.16. +CMMS More Messages to Send

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

Read command reports the current value of the parameter <n> .

Test command returns supported values as a compound value.

Command	Response
+CMMS=[<n>]	<CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR:<err><CR><LF>
+CMMS?	<CR><LF>+CMMS: <n><CR><LF> <CR><LF>OK<CR><LF>

+CMMS=?	<CR><LF>+CMMS: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n>:

0 disable (Default Value)

1 keep enabled until the time between the response of the latest message send command (+CMGS, +CMSS, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), then ME shall close the link and TA switches <n> automatically back to 0

2 enable (if the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA shall not switch automatically back to <n>=0)

Example

```
AT+CMMS?
+CMMS: 0

OK
AT+CMMS=?
+CMMS: (0,1,2)

OK
```

7.17. +CPMS Preferred Message Storage

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of possible <err> values.

Read command reports the message storage status.

Test command returns lists of memory storages supported by the TA

Command	Response
+CPMS=<mem1>[,<mem2>[, <mem3>]]	<CR><LF>+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CPMS?	<CR><LF>+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CMS ERROR: <err><CR><LF>
+CPMS=?	<CR><LF>+CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mem1>: string type; memory from which messages are read and deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD); defined values (others are manufacturer specific):

"ME" ME message storage

"SM" (U)SIM message storage

"MT": Same as “ME” storage(not supported yet)

"SR": Status report storage(not supported yet)

<mem2>: string type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW)); refer <mem1> for defined values

<mem3>:string type; memory to which received SMs are preferred to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); refer <mem1> for defined values; received CBMs are always stored in "BM" (or some manufacturer specific storage) unless directly forwarded to TE; received status reports are always stored in "SR" (or some manufacturer specific storage) unless directly forwarded to TE

<total1>: integer type; total number of message locations in <mem1>

<total2>: integer type; total number of message locations in <mem2>

<total3>: integer type; total number of message locations in <mem3>

<used1>: integer type; number of messages currently in <mem1>

<used2>: integer type; number of messages currently in <mem2>

<used3>: integer type; number of messages currently in <mem3>

Example

```
AT+CPMS?
+CPMS: "SM",10,40,"SM",10,40,"ME",1,100

OK
```

7.18. +CMTI New Message Indications

When new message is received and stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code.

Command	Response
	<CR><LF>+CMTI: <mem>,<index><CR><LF>

Parameter

<mem1>: string type

"ME" ME message storage

"SM" (U)SIM message storage

"SR" status report storage

<index>: integer type; value in the range of location numbers supported by the associated memory

Example

```
+CMTI: “SM”,10
```

7.19. +ZSPWAKEUP Enable/disable specified SMS remote wakeup function

This command is used to Enable/disable specified SMl remote wakeup function.

Command	Response
+ZSPWAKEUP=<switch>	<CR><LF>OK<CR><LF>
+ZSPWAKEUP?	<CR><LF>+ZSPWAKEUP: <switch> <CR><LF>OK<CR><LF> OR

	<CR><LF>ERROR<CR><LF>
+ZSPWAKEUP=?	<CR><LF>+ZSPWAKEUP:(e/E,d/D) <CR><LF>OK<CR><LF>

Parameter

<switch>:

E/e Enable specified SMS remote wakeup function

D/d Disable specified SMS remote wakeup function

NOTE:

1. the set value is stored in NVM, and it still takes effect after restart.
2. The read&test command will return ERROR before set command is not sent.

Example

```
AT+ZSPWAKEUP=?
+ZSPWAKEUP: (e/E,d/D)

OK
AT+ZSPWAKEUP=d

OK
AT+ZSPWAKEUP?
+ZSPWAKEUP: d

OK
```

7.20. +ZWAKEUPSMS Set the specified SMS content used for remote wakeup

This command is used to set the specified SMS content used for remote wakeup, and then this command can wakeup the host machine (AP Side). This command will take effect once send, and it still takes effect after restart.

Command	Response
+ZWAKEUPSMS=<para>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZWAKEUPSMS?	<CR><LF>+ZWAKEUPSMS:<para> <CR><LF>OK<CR><LF>

Parameter

<para>: The contents of SMS, the available characters are'A'~'Z', 'a'~'z', '0'~'9'. We recommend that the length of SMS content is not exceed 20 characters. the set value is stored in NVM, and it still takes effect after restart.

Example

```
AT+ZWAKEUPSMS?          //When not set the specified SMS content, the return value is Unconfigured
+ZWAKEUPSMS: Unconfigured
OK
AT+ZWAKEUPSMS=123       // The specified SMS content used for remote wakeup is 123
OK
AT+ZWAKEUPSMS?
```

```
+ZWAKEUPSMS: 123
OK
```

7.21. +CMS ERROR Message Service Failure Result Code

This is NOT a command; it is the error response to +Cxxx 3gpp TS 27.005 commands

Result code +CMS ERROR: <err> indicates an error related to mobile equipment or network. The operation is like ERROR result code. None of the following commands in the same command line is executed. Neither ERROR nor OK result code shall be returned. ERROR is returned normally when error is related to syntax or invalid parameters.

Command	Response
	<CR><LF>+CMS ERROR: <err><CR><LF>

Parameter

<err> values used by common messaging commands.

The **<err>** values are reported in the table

Numeric Format	**Meaning**
General error:	
0…127	3GPP TS 24.011 Annex E-2 values
128…255	3GPP TS 24.040 sub clause 9.2.3.22 values
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN required
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network time-out
340	no +CNMA acknowledgement
500	unknown error

8. Network Service Commands

8.1. +CREG Network registration

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>],[<AcT>]] when<n>=2 and there is a change of the network cell.

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

Test command returns the range of supported <n>.

Command	Response
+CREG=[<n>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CREG?	+CREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>]] <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CREG=?	<CR><LF>+CREG: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<n>:

0 disable network registration unsolicited result code

1 enable network registration unsolicited result code +CREG: <stat>

2 enable network registration and location information unsolicited result code

+CREG: <stat>[,<lac>,<ci>[,<Act>]], if network is CDMA/EVDO, return: +CREG: <stat>[,<sid>,<cid>,<Act>]

<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

<lac>: string type; two bytes location area code in hexadecimal format

<ci>: string type; two-byte cell ID in hexadecimal format

<sid>: System identifier

<cid>: Cell identify

<AcT>: integer type; access technology of the serving cell

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 Others, such as CDMA/EVDO

Example

```
AT+CREG?
+CREG: 0,1

OK
AT+CREG=?
+CREG: (0-2)

OK
```

8.2. +CEREG Network registration

Set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT network registration status, or code +CEREG: <stat>[,[<lac>],[<ci>],[<AcT>]] when<n>=2 and there is a change of the network cell. Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac> and <ci> are returned only when <n>=2 and MT is registered in the network.

Test command returns the range of supported <n>.

Command	Response
+CEREG=[<n>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CEREG?	Different results are returned depending on the setting value; When <n>=2, return: +CEREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>]] <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CEREG=?	<CR><LF>+CEREG: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n>:

0 disable network registration unsolicited result code

1 enable network registration unsolicited result code +CEREG: <stat>

2 enable network registration and location information unsolicited result code

+CEREG: <stat>[,[<lac>],[<ci>],[<AcT>]]

<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

<lac>: string type; two bytes location area code in hexadecimal format

<ci>: string type; four-byte cell ID in hexadecimal format

<AcT>: integer type; access technology of the serving cell

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

Example

```
AT+CEREG?
+CEREG: 0,1

OK
AT+CEREG=?
+CEREG: (0-2)

OK
```

8.3. +COPS Operator selection

Set command forces an attempt to select and register the LTE network operator. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper>.

Read command returns the current mode and the currently selected operator. If no operator is selected, <format> and<oper> are omitted.

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

Command	Response
+COPS=[<mode>[,<format>[,<oper>[,<AcT>]]]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+COPS?	<CR><LF>+COPS: <mode>[,<format>,<oper>[,<AcT>]]<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+COPS=?	<CR><LF>+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,,(list of supported <mode>s),(list of supported <format>s)]<CR><LF>

	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<mode>:

0 automatic (<oper> field is ignored)

1 manual (<oper>field shall be present)

2 deregister from network

3 set only <format>(for read command +COPS?), do not attempt registration/deregistration (<oper>field is ignored); this value is not applicable in read command response

4 manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered

<format>:

0 long format alphanumeric <oper>

1 short format alphanumeric <oper>

2 numeric <oper>

<oper>: string type;

<AcT>: access technology selected:

0 GSM

1 GSM Compact

2 UTRAN

3 GSM w/EGPRS

4 UTRAN w/HSDPA

5 UTRAN w/HSUPA

6 UTRAN w/HSDPA and HSUPA

7 E-UTRAN

<stat>:

0 unknown

1 available

2 current

3 forbidden

Example

```
AT+COPS=?
+COPS: (1,"CHN-UNICOM","UNICOM","46001",7),(3,"CHN-CT","CT","46011",7),,(0-4),(0-2)

OK
```

8.4. +CSQ Signal quality

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

Test command returns values supported as compound values.

Command	Response
+CSQ	GSM/CDMA/EVDO: <CR><LF>+CSQ: <rssi>,<ber><CR><LF><CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

	WCDMA/TDSCDMA: <CR><LF>+CSQ: <rscp>,<ber><CR><LF><CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF> LTE: <CR><LF>+CSQ: <rsrp>,<ber><CR><LF><CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CSQ=?	<CR><LF>+CSQ: (list of supported <rssi>s),(list of supported <ber>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<rssi>: the Received Signal Strength Indication (RSSI) in GSM/CDMA/EVDO RAT

GSM	CDMA/EVDO
0 -113 dBm or less	0 -124dB or less
1 -111 dBm	1 - 123dB
2...30 -109... -53 dBm	2 -30 -121...-76dB
31 -51 dBm or greater	31 -75dB or greater
99 No network	99 No network

<rscp>:the Received Signal Code Power (RSCP) in WDMA/TDSCDMA

0 [-120,-110)dB;	16 [-95,-93)dB;
1 [-110,-109)dB;	17 [-93,-92)dB;
2 [-109,-108)dB;	18 [-92,-91)dB;
3 [-108,-107)dB;	19 [-91,-90)dB;
4 [-107,-106)dB;	20 [-90,-89)dB;
5 [-106,-105)dB;	21 [-89,-86)dB;
6 [-105,-104)dB;	22 [-86,-83)dB;
7 [-104,-103)dB;	23 [-83,-80)dB;
8 [-103,-102)dB;	24 [-80,-77)dB;
9 [-102,-101)dB;	25 [-77,-74)dB;
10 [-101,-100)dB;	26 [-74,-71)dB;
11 [-100,-99)dB;	27 [-71,-68)dB;
12 [-99,-98)dB;	28 [-68,-65)dB;
13 [-98,-97)dB;	29 [-65,-62)dB;
14 [-97,-96)dB;	30 [-62,-59)dB;
15 [-96,-95)dB;	31 [-59,-25]dB;
	99 No network

<rsrp>: the Reference Signal Received Power (RSRP) in LTE RAT

0 [-140,-130)dB;	16 [-109,-107)dB;
1 [-130,-128)dB;	17 [-107,-105)dB;
2 [-128,-126)dB;	18 [-105,-103)dB;
3 [-126,-124)dB;	19 [-103,-100)dB;
4 [-124,-122)dB;	20 [-100,-97)dB;
5 [-122,-120)dB;	21 [-97,-94)dB;
6 [-120,-118)dB;	22 [-94,-91)dB;
7 [-118,-117)dB;	23 [-91,-88)dB;
8 [-117,-116)dB;	24 [-88,-85)dB;
9 [-116,-115)dB;	25 [-85,-80)dB;
10 [-115,-114)dB;	26 [-80,-75)dB;
11 [-114,-113)dB;	27 [-75,-70)dB;
12 [-113,-112)dB;	28 [-70,-65)dB;
13 [-112,-111)dB;	29 [-65,-60)dB;
14 [-111,-110)dB;	30 [-60,-55)dB;
15 [-110,-109)dB;	31 [-55,-44)dB;
	99 No network

<ber> (in percent): 0...7 the Bit Error Rate (BER) in GSM RAT.

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 No network

Example

```
AT+CSQ
+CSQ: 17,99


OK
```

8.5. +CPOL Preferred operator list

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

Execute command writes an entry in the SIM/USIM list of preferred PLMNs. If no list has been previously selected, the User controlled PLMN selector with Access Technology, $EF_{PLMNwAcT,}$ is the one accessed by default. 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. The Access Technology selection parameters, <GSM_AcT>, <GSM_Compact_AcT> and <UTRAN_AcT>, are required when writing User controlled PLMN selector with Access Technology, EF $EF_{PLMNwAcT}$, Operator controlled PLMN selector with Access Technology $EF_{OPLMNwAcT}$ and HPLMN selector with Access Technology $EF_{HPLMNwAcT}$, see TS 31.102.

Read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS, with

the Access Technologies for each PLMN in the list.

Test command returns the whole index range supported by the SIM.

Command	Response
+CPOL=[<index>][,<format>[,<oper>[,<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<E-UTRAN_AcT>]]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CPOL?	<CR><LF>+CPOL: <index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<E-UTRAN_AcT1>] +CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<E-UTRAN_AcT1>]<CR><LF> [...]] <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CPOL=?	<CR><LF>+CPOL: (list of supported <index>s),(list of supported <format>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<index>: integer type; the order number of operator in the SIM/USIM preferred operator list (1~8)

<format>:

0 long format alphanumeric <oper>

1 short format alphanumeric <oper>

2 numeric <oper>

<oper>: string type; <format> indicates if the format is alphanumeric or numeric (see +COPS)

<GSM_AcT>: GSM access technology:

0 access technology not selected

1 access technology selected

<GSM_Compact_AcT>: GSM compact access technology:

0 access technology not selected

1 access technology selected

<UTRAN_AcT>: UTRA access technology

0 access technology not selected

1 access technology selected

<E-UTRAN_AcT>: integer type; E-UTRAN access technology

0 access technology not selected

1 access technology selected

Example

```
AT+CPOL=,2,"46001",0,0,1,0
OK
AT+CPOL=1
OK
```

```
AT+CPOL?
+CPOL: 2,2,"46000",0,0,1,0
+CPOL: 3,2,"46001",0,0,1,0

OK
AT+CPOL=,0
OK
AT+CPOL?
+CPOL: 2,0,"CHINA    MOBILE",0,0,1,0
+CPOL: 3,0,"CHN-UNICOM",0,0,1,0

OK
AT+CPOL=,1
OK
AT+CPOL?
+CPOL: 2,1,"CMCC",0,0,1,0
+CPOL: 3,1,"UNICOM",0,0,1,0

OK
```

8.6. +COPN Read operator names

Execute command returns the list of operator names from the MT. Each operator code <numeric*n*> that has an alphanumeric equivalent <alpha*n*> in the MT memory shall be returned.

Test command returns the OK result code.

Command	Response
+COPN	<CR><LF>+COPN: <numeric1>,<alpha1><CR><LF> [<CR><LF>+COPN: <numeric2>,<alpha2><CR><LF> [...]] <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+COPN=?	<CR><LF>OK<CR><LF>

Parameter

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

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

Example

```
AT+COPN
+COPN: "00101","Test PLMN 1-1"
+COPN: "00102","Test PLMN 1-2"
+COPN: "00201","Test PLMN 2-1"
+COPN: "20201","GR COSMOTE"
+COPN: "20201","GR COSMOTE"
+COPN: "20205","vodafone GR"
```

```
+COPN: "20210","TIM GR"
…

OK
```

8.7. +CTZU Automatic Time Zone Update

Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

Command	Response
+CTZU=<onoff>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CTZU?	<CR><LF>+CTZU: <onoff><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CTZU=?	<CR><LF>+CTZU: (list of supported <onoff>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<onoff>: integer type value indicating:

0 Disable automatic time zone update via NITZ

1 Enable automatic time zone update via NITZ.

Example

```
AT+CTZU=?
+CTZU: (0-1)

OK
AT+CTZU?
+CTZU: 0

OK
```

8.8. +CTZR Time Zone Reporting

This set command enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed. If setting fails in an MT error, +CME ERROR: <err> is returned.

Read command returns the current reporting settings in the MT.

Test command returns supported <onoff>values.

NOTE: The time zone reporting is not affected by the Automatic Time Zone setting command, +CTZU.

Command	Response
+CTZR=<onoff>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CTZR?	<CR><LF>+CTZR: <onoff><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CTZR=?	<CR><LF>+CTZR: (list of supported <onoff>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<onoff>: integer type value indicating:

0 Disable time zone change event reporting (default).

1 Enable time zone change event reporting.

Example

```
AT+CTZR?
+CTZR: 0

OK
```

8.9. +ZCELLINFO Request the information about serving cell

This command is used to request LTE cell info, like global cell ID, physical cell ID, band information.

Command	Response
+ZCELLINFO?	When registered to LTE, it will return: <CR><LF>+ZCELLINFO: <TAC>,<Global_Cell_ID>,<Physical_Cell_ID>, <Cell_Band>,<DL_Earfcn><CR><LF> <CR><LF>OK<CR><LF> When registered to GSM/WCDMA/TD-SCDMA, it will return: <CR><LF>+ZCELLINFO: <LAC>,< Cell_ID>, <Cell_Band><CR><LF> <CR><LF>OK<CR><LF> When registered toHDR/CDMA, it will return: <CR><LF>+ZCELLINFO: <Local_ID>,< Cell_ID>, <Cell_Band><CR><LF> <CR><LF>OK<CR><LF> When registered toSRLTE, it will return: <CR><LF>+ZCELLINFO: <Global_cell_ID>,<Physical_Cell_ID>, <Cell_Band>,<earfcn><CR><LF> <CR><LF>OK<CR><LF> Or it will return: <CR><LF>ERROR<CR><LF>

Parameter

LTE:

<TAC>: Tracking area code

<Global_Cell_ID>: Global Cell ID

<Physical_Cell_ID>: Physical Cell ID

<Cell_Band>: Cell Band

<DL_Earfcn>: DL Earfcn

GSM/WCDMA/TD-SCDMA :

<LAC>,location area code

<Cell_ID>, Cell ID

<Cell_Band>CellBand

Example

```
AT+ZCELLINFO=?
+ZCELLINFO:(LTE:TAC,Global Cell ID,Physical Cell ID,Cell band,DL Earfcn),(WCDMA:LAC,Cell ID,Cell Band),(TDSCDMA:LAC,Cell ID,Cell Band),(GSM:LAC,Cell ID,Cell Band)

OK
AT+ZCELLINFO?
+ZCELLINFO: 0X911B,0X0BB75A31,0X0000016B,LTE B3,1675

OK
```

8.10. +ZLOCKCELL lock cell command

This command is used to lock cell and frequency, and only supported on ME3630-A, ME3630E1CV1.0B14, ME3630E2CV1.0B04 and above version. This command will take effect after restart the module, and the set command will save after the module is powered off.

Note: This command should coordinate with AT+ZSNT. When the network mode is LTE(WCDMA) set by "AT+ZSNT=6.0,0(AT+ZSNT=2,0,0)", the cell of LTE(WCDMA) will be locked only.

Command	Response
+ZLOCKCELL=<lock_flag>[,<mode>,<earfcn_or_uarfcn>,<pci_or_psc>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZLOCKCELL=?	<CR><LF>+ZLOCKCELL: lock_flag(0-1),sys_mode(0-1),uarfcn_earfcn(0-65535),psc(0-511),pci(0-503)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZLOCKCELL?	<CR><LF>+ZLOCKCELL: <CR><LF> <CR><LF> wcdma,[uarfcn:<uarfcn>,psc:<psc>,]lock:<lock_state><CR><LF> <CR><LF>lte,[earfcn:<earfcn>,pci:<pci>,]lock:<lock_state><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR <CR><LF>

Parameter

<lock_flag>: default value is 0

0 unlock

1 lock

<mode>:

0 WCDMA

1 LTE

<earfcn_or_uarfcn>: frequency point, range 0~65535

<pci_or_psc>: physics cell or main scrambler, pci range 0~503, and psc range 0~511

<lock_state>:

on lock is on

off lock is off, that is don't lock any frequency

Example

```
AT+ZLOCKCELL=1,1,1650                    //lock frequency 1650
OK

AT+ZLOCKCELL =1,1,1650,186               //lock LTE frequency 1650, cell 186
OK

AT+ZLOCKCELL=?                           //query parameter range list
+ ZLOCKCELL: lock_flag(0-1),sys_mode(0-1),uarfcn_earfcn(0-65535),psc(0-511),pci(0-503)

OK
AT+ZLOCKCELL?                            //query current frequency that is locked
+ ZLOCKCELL:
wcdma,lock::off
lte,earfcn:1650,lock:on                  //lock LTE frequency 1650

OK
AT+ZLOCKCELL?
+ ZLOCKCELL:
wcdma,lock::off
lte,earfcn:1650,pci:186,lock::on         //lock LTE frequency 1650, cell 186

OK
AT+ZLOCKCELL?
+ ZLOCKCELL:
wcdma,uarfcn:10663,lock::on              //lock WCDMA frequency 10663
lte,lock::off

OK
AT+ZLOCKCELL?
+ ZLOCKCELL:
wcdma,uarfcn:10663,psc:447,lock:on       //lock WCDMA frequency 10663, cell 447
lte,lock::off
OK
```

```
AT+ZLOCKCELL?
+ ZLOCKCELL:
wcdma,lock:off
lte,lock:off                    //not lock any frequency
OK

AT+ZLOCKCELL =0              //unlock, this command will take effect after restart the module
OK
```

8.11. +ZSNT Configuration of Network Selection Mode

This command is used to configure the network selection mode.

Command	Response
+ZSNT=<cm_mode>,<net_sel_mode>,<pref_acq>	+CME ERROR: <err> or<CR><LF>OK<CR><LF>
+ZSNT?	+ZSNT: <cm_mode>,<net_sel_mode>,<pref_acq> +CME ERROR: <err>
+ZSNT=?	List all values can config.

Parameter

<cm_mode>: Preferred network mode.

0 AUTOMATIC (default)

1 GSM_ONLY

2 WCDMA_ONLY

3 TD-SCDMA_ONLY (not support)

4 CDMA ONLY

5 HDR ONLY

6 LTE_ONLY

7 WCDMA AND LTE ONLY

8 TDSCDMA GSM WCDMA And LTE Only (not support)

9 CDMA and HDR only (not support)

10 TDSCDMA_WCDMA_LTE ONLY (not support)

Others reserved.

Note: Parameters larger than 10 can only be queried and cannot be set.

<net_sel_mode>: selection of network selection mode

0 AUTOMATIC network selection (default)

1 MANUAL network selection.

NOTE: This parameter only used for read command. Set manual network selection should use AT+COPS.

2 LIMITIED network selection

<pref_acq>: Preferred network mode acquisition parameter.

0 AUTOMATIC order (default)

1 GSM_WCDMA prefer

2 WCDMA_GSM prefer

3 LTE prefer

Example

```
AT+ZSNT=0,0,2
OK
AT+ZSNT?
+ZSNT: 0,0,2

OK
AT+ZSNT=?
+ZSNT: (0-10),(0-2),(0-3)

OK
```

8.12. +ZSNTE Network Selection according to 2G/3G/4G

This command is used to do network selection according to 2G/3G/4G. it takes effect once setting, and can also be saved after restart the module.

This command is only valid when the module register to network.

Command	Response
+ZSNTE=<mode>	<CR><LF>+CME ERROR: <err><CR><LF> or <CR><LF>OK<CR><LF>
+ZSNTE?	<CR><LF>+ZSNTE: <mode><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZSNTE=?	<CR><LF>+ZSNTE: list of supported <mode>s<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>: Preferred network mode, this is used to set the 10th parameter of NV.

0 4G LTE Preferred (all Combination of mode with LTE, LTE preferred)

1 3G Preferred

2 2G ONLY

3 3G ONLY

4 4G ONLY

Example

```
AT+ZSNTE=3
OK
AT+ZSNTE?
+ZSNTE: 3

OK
AT+ZSNTE=?
+ZSNTE: 0-4
```

```
OK
```

8.13. +ZPAS Check Module Status

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

When the network changes, the new type of network is routed to TE using unsolicited code.

Command	Response
+ZPAS?	<CR><LF>+ZPAS: <network>,<srv_domain>[,<LTE_MODE>]<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<network>: the type of current network

No Service, Limited Service, GSM, GPRS, CDMA, EVDO, EHRPD, UMTS, HSDPA, HSUPA, HSPA, HSPA+, LTE, TD-SCDMA

<srv_domain>: service domain

CS_ONLY CS domain service available.

PS_ONLY PS domain service available.

CS_PS CS&PS domain service available.

CAMPED camp in a cell.

<LTE_MODE>: When <network> is LTE, it will return this parameter, the value can be:

FDD When registered to LTE-FDD

TDD When registered to LTE-TDD

Example

```
AT+ZPAS?
+ZPAS: "LTE","CS_PS","FDD"

OK
```

8.14. ^SYSINFO Request System INFO

The Execution command is used to return current system information.

Command	Response
^SYSINFO	<CR><LF>^SYSINFO:<srv_status>,<srv_domain>,<roam_status>,<sys_mode>,<sim_state>[,[<reserve>],<sys_submode>]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

< srv_status>:

0 Out of service

1 Restricted service

2 Service

3 restricted region service

4 Power-saving mode

<srv_domain>:

0 Out of service

1 CS service

2 PS service

3 Ps and CS service

4 EPS service

<roam_status> :

0 Non-roaming status

1 Roaming status

<sys_mode>:

0 Out of service

2 CDMA

3 GSM/GPRS mode

4 HDR

5 WCDMA mode

7 GW

9 LTE

10 GWL

11 TDS

Other values Reserved

<sim_state>:

0 invalid card status

1 valid card status

255 card not existed or PIN required

<reserve>: reserved

<sys_submode>: system sub mode

0 Out of service

1 GSM mode

2 GPRS mode

3 EDGE mode

4 WCDMA mode

5 HSDPA mode

6 HSUPA mode

7 HSUPA and HSDPA mode

8 TD-SCDMA mode

9 TDD-SUBACT

10 FDD-SUBACT

Example

```
AT^SYSINFO
^SYSINFO: 2,3,0,15,1

OK
```

8.15. +ZBAND Band lock

This command is used to lock the specified band(s) according to the BAND MASK input by the users. The set command needs four hexadecimal parameters, the second and third one are reserved.

When the parameters are all/ALL, the module band is set to support all the bands, when they are set to 0, it will return ERROR.

Note: We don't recommend to use this command, as if the setting parameters is not proper set, it may cause the module crash. If you has any question to the setting parameter of this command, you can consult to our company.

The lock bands need restarting(ME3630J2AV1.0B17 and above version **do not** need restart the module) before they can take effect. Full spectrum will be set at the time of unlocking.

Command	Response
+ZBAND=<gw_band_mask>,<cdma_band_mask>,<tdscdma_band_mask>,<lte_band_mask>	<CR><LF>OK<CR><LF> When MS error: <CR><LF>ERROR<CR><LF>
+ZBAND? (Read command)	<CR><LF>+ZBAND: <CR><LF> [(list of supported<gw_band_name>,)] [(list of supported<cdma_band_name>,)] [(list of supported<tdscdma_band_name>,)] [(list of supported<lte_band_name>)]<CR><LF> <CR><LF>OK<CR><LF>
+ZBAND=?	<CR><LF>+ZBAND:<CR><LF> (list of supported <gw_band_mask>s) <CR><LF> (list of supported <cdma_band_mask>s) <CR><LF> (listof supported <tdscdma_band_mask>s)<CR><LF> (list of supported<lte_band_mask>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameters of set command

<gw_band_mask>: a hexadecimal value that specifies the GW frequency band. You can set the value as the one or the combination of more as follows:

ME3630-U	ME3630-E	ME3630-J
0X0800000:WCDMA BAND2 0X4000000:WCDMA BAND5	0X80:GSM1800 0x300:GSM900(0x300=0x200+0x100, not support set to 0x200 or 0x100 separately) 0X400000:WCDMA BAND1 0X2000000000000:WCDMA BAND8	0X400000:WCDMA BAND1 0X4000000:WCDMA BAND5 0X8000000:WCDMA BAND6 0X2000000000000:WCDMA BAND8 0X10000000000000000:WCDMA BAND19
00000000:disable ALL the bands in this mode ALL/all:all the bands of above		

<cdma_band_mask>: a hexadecimal value that specifies the CDMA frequency band.

0X00 disable ALL the bands in this mode

ALL/al all the bands of above

<tdscdma_band_mask>: a hexadecimal value that specifies the TD-SCDMA frequency band.

0X00 disable ALL the bands in this mode

ALL/all all the bands of above

<lte_band_mask>: a hexadecimal value that specifies the LTE frequency band, You can set the value as the one or the combination of more as follows

ME3630-U		ME3630-E		ME3630-J	
0X02	LTE BAND2	0X01	LTE BAND1	0X01	LTE BAND1
0X08	LTE BAND4	0X04	LTE BAND3	0X04	LTE BAND3
0X10	LTE BAND5	0X40	LTE BAND7	0X10	LTE BAND5
0X0800	LTE BAND12	0X0080	LTE BAND8	0X40	LTE BAND7
0X10000	LTE BAND	0X80000	LTE BAND 20	0X0080	LTE BAND8
17				0X0400	LTE BAND11
				0X20000	LTE BAND18
				0X40000	LTE BAND19
				0X100000	LTE BAND 21
				(note: module can support one of bands 11 and 21 only, and we support band 21 in default)	
0	disable ALL the bands in this mode				
ALL/all	all the bands of above				

Parameters of Read command (AT+ZBAND?)

<gw_band_name>: Decimal number, the GW band name.

ME3630-U		ME3630-E		ME3630-J	
2	WCDMA BAND2	1800	GSM1800	1	WCDMA BAND1
5	WCDMA BAND5	900	GSM900	5	WCDMA BAND5
		1	WCDMA BAND1	6	WCDMA BAND6
		8	WCDMA BAND8	8	WCDMA BAND8
				19	WCDMA BAND19

<cdma_band_name>: Decimal number, the CDMA band name.

0 not support

<tdscdma_band_name>: Decimal number, the TD-SCDMA band name.

0 not support

<lte_band_name>: Decimal number, the LTE band name.

ME3630-U		ME3630-E		ME3630-J	
2	LTE BAND2	1	LTE BAND1	1	LTE BAND1
4	LTE BAND 4	3	LTE BAND3	3	LTE BAND3
5	LTE BAND 5	7	LTE BAND7	5	LTE BAND5
12	LTE BAND 12	8	LTE BAND8	7	LTE BAND7
17	LTE BAND 17	20	LTE BAND 20	8	LTE BAND8
				11	LTE BAND11
				18	LTE BAND18
				19	LTE BAND19
				21	LTE BAND 21

Example(Take ME3630-U for example):

```
at+zband=0,0,0,0        -------when the set command is all 0, it stands not scan all the frequency bands, and will return
ERROR.
ERROR

❖ Lock only one BAND
AT+ZBAND=800000,0,0,0       -------Lock one band: WCDMA BAND2
OK
AT+ZBAND?                   -------Read the locked BAND
+ZBAND:
GW: 2

OK
❖ Lock all the supported bands
at+zband=all,0,0,all
OK

❖ Enable band B17(LOCK several bands, the module support band 2,4,5,12,17 )
at+zband=all,0,0,1081A       //0X1081A =[0X02(TE BAND2)+0X08(LTE BAND4)+0X10(LTE BAND5)+0X0800(LTE
BAND12)+0X10000 (LTE BAND 17)]

OK

❖ Disable band B17(LOCK several bands, the module support band 2,4,5,12)
at+zband=all,0,0,81A       //0X81A =[0X02(TE BAND2)+0X08(LTE BAND4)+0X10(LTE BAND5)+0X0800(LTE BAND12)]

OK

❖ List all the supported band_mask
AT+ZBAND=?
+ZBAND:
GW:(800000, 4000000)
CDMA:(0)
TDS:(0)
LTE:(2, 8, 10, 800, 10000)

OK
```

8.16. +ZBANDEX Band lock

This command is used to lock the specified band(s) according to the BAND MASK input by the users. The set command needs four hexadecimal parameters, the second and third one are reserved.

When the parameters are all/ALL, the module band is set to support all the bands, when they are set to 0, it will return ERROR.

Note1: We don't recommend to use this command, as if the setting parameters is not proper set, it may cause the module crash. If you have any question to the setting parameter of this command, you can consult to our company.

Note2: This command currently only supports ME3630U.

The lock bands need restarting before they can take effect. Full spectrum will be set at the time of unlocking.

Command	Response
+ZBANDEX=<gw_band_mask>,<cdma_band_mask>,<tdscdma_band_mask>,<lte_band_mask>	<CR><LF>OK<CR><LF> When MS error: <CR><LF>ERROR<CR><LF>
+ZBANDEX? (Read command)	<CR><LF>+ ZBANDEX: <CR><LF> <CR><LF>[(list of supported<gw_band_name>,)] [(list of supported<cdma_band_name>,)] [(list of supported<tdscdma_band_name>,)] [(list of supported<lte_band_name>)]
+ZBANDEX=?	<CR><LF>+ZBANDEX:<CR><LF> (list of supported <gw_band_mask>s) <CR><LF> (list of supported <cdma_band_mask>s) <CR><LF> (listof supported <tdscdma_band_mask>s)<CR><LF> (list of supported<lte_band_mask>s)<CR><LF>

Parameters of set command

<gw_band_mask>: a hexadecimal value that specifies the GW frequency band. You can set the value as the one or the combination of more as follows:

0X0800000 WCDMA BAND2
0X4000000 WCDMA BAND5
00000000 disable ALL the bands in this mode
ALL/all all the bands of above

<cdma_band_mask>: a hexadecimal value that specifies the CDMA frequency band.

0X00 disable ALL the bands in this mode
ALL/all all the bands of above

<tdscdma_band_mask>: a hexadecimal value that specifies the TD-SCDMA frequency band.

0X00 disable ALL the bands in this mode
ALL/all all the bands of above

<lte_band_mask>: a hexadecimal value that specifies the LTE frequency band, You can set the value as the one or the combination of more as follows

0X02 LTE BAND2
0X08 LTE BAND4
0X10 LTE BAND5
0X0800 LTE BAND12
0X10000 LTE BAND 17
0 disable ALL the bands in this mode
ALL/all all the bands of above

Parameters of Read command(AT+ZBANDEX?)

<gw_band_name>: Decimal number, the GW band name.

2 WCDMA BAND2

5 WCDMA BAND5

<cdma_band_name>: Decimal number, the CDMA band name.

0 not support

<tdscdma_band_name>: Decimal number, the TD-SCDMA band name.

0 not support

<lte_band_name>: Decimal number, the LTE band name.

2 LTE BAND2

4 LTE BAND 4

5 LTE BAND 5

12 LTE BAND 12

17 LTE BAND 17

Example

at+zbandex=0,0,0,0 -------when the set command is all 0, it stands not scan all the frequency bands, and will return ERROR.
ERROR

❖ Lock only one BAND

AT+ZBANDEX=800000,0,0,0 -------Lock one band: WCDMA BAND2
OK
AT+ZBANDEX? -------Read the locked BAND
+ZBANDEX:
GW: 2

OK

❖ Lock all the supported bands

at+zbandex=all,0,0,all
OK

❖ Enable band B17(LOCK several bands, the module support band 2,4,5,12,17)

at+zbandex=all,0,0,1081A //0X1081A =[0X02(TE BAND2)+0X08(LTE BAND4)+0X10(LTE BAND5)+0X0800(LTE BAND12)+0X10000 (LTE BAND 17)]

OK

❖ Disable band B17(LOCK several bands, the module support band 2,4,5,12)

at+zbandex=all,0,0,81A //0X81A =[0X02(TE BAND2)+0X08(LTE BAND4)+0X10(LTE BAND5)+0X0800(LTE BAND12)]

OK

❖ List all the supported band_mask

AT+ZBANDEX=?
+ZBANDEX:

GW:(800000, 4000000)
CDMA:(0)
TDS:(0)
LTE:(2, 8, 10, 800, 10000)

OK

8.17. +ZARFCN Return current ARFCN

This command is used to return the current ARFCN.

Command	Response
+ZARFCN?	When register to network, return: <CR><LF><mode>:<value><CR><LF> <CR><LF>OK<CR><LF> Or return: <CR><LF>ERROR<CR><LF>

Parameter

<mode>: The registered network

GSM

UMTS

LTE

<value>: the current ARFCN, it has different meaning when the registered network is different.

GSM:arfcn

UMTS:uarfcn

LTE:earfcn

Example

AT+ZARFCN?
LTE: 1675

OK

8.18. +ZCDS Query Serving Cell Information

This command is used to query the parameter values of the current serving cell.

Command	Response
+ZCDS?	In different network mode, the return value is different. CDMA /EVDO: <CR><LF>+ZCDS:<channel>,<mcc>,<mnc>,<sid>,<nid>,<bid>,<rx_power>,<tx_power>,<sinr>,<ecio>,<imsi_buf><CR><LF> <CR><LF>OK<CR><LF> LTE: <CR><LF>+ZCDS:<earfcn>,<mcc>,<mnc>,<tac_id>,<cell_id>,<rx_power>,<tx_power>,<sinr>,<ecio>,<pci>,<rsrq>,<imsi_buf><CR><LF>

	<CR><LF>OK<CR><LF> TD-SCDMA/ WCDMA: <CR><LF>+ZCDS:<uarfcn>,<mcc>,<mnc>,<lac_id>,<cell_id>,<rx_power>,<tx_power>,<sinr>,<ecio>,<imsi_buf><CR><LF> <CR><LF>OK<CR><LF> GSM: <CR><LF>+ZCDS:<arfcn>,<mcc>,<mnc>,<lac_id>,<cell_id>,<rx_power>,<tx_power>,<sinr>,<ecio>,<imsi_buf><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<channel>: UARFCN UMTS assigned radio channel

<earfcn/arfch/uarfcn>: Absolute Radio Frequency Channel Number of the BCCH carrier

<mcc>: Mobile Country Code

<mnc>: Mobile Network Code

<tac_id> Tracking Area Code

<cell_id>: Cell identify

<lac_id>: Location Area Code

<pci> Physical cell ID

<sinr> Serving cell SINR information

<sid> System identifier

<nid> network identifier

<bid>: BASE ID --- base station identification number

<sinr> Serving cell SINR information

<rsrq>: Reference Signal Received Quality, valid under LTE mode

<rx_power>: Receiving Signal strength in dBm

<tx_power>: TX power information

<ecio>: Pilot Strength

<imsi_buf>: International Mobile Station ID (IMSI)

Example

When registered to LTE network:

AT+ZCDS?

+ZCDS:1675,460,1,911B,BB75A31,-99,99,14,-8,363,-13,460019011339325

OK

When registered to GSM network:

AT+ZARFCN?

GSM: 108

OK

AT+ZCDS?

+ZCDS:108,460,1,20E6,C8C4,-61,33,0,0,460019011339325

```
OK
When registered to UMTS network:
AT+ZPAS?
+ZPAS: "UMTS","CS_PS"

OK
AT+ZCDS?
+ZCDS:10713,460,1,BB1D,C1D30FF,199,99,0,0,460019011339325

OK
AT+ZARFCN?
UMTS: 10713

OK
```

8.19. +ZSRSP Query RSRP,RSRQ,SINR of the main cell

This command is used to query the RSRP,RSRQ,SINR of the module's main cell.

Note: This command is only valid when the module register to LTE network.

This command is supported by module ME3630-E and ME3630-A.

Command	Response
+ZSRSP?	<CR><LF>+ZSRSP:<rsrp >,< rsrq>,<rssi >,<sinr><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<rsrp>: Reference Signal Received Power, unit: dBm

<rsrq>: Reference Signal Received Quality, unit: dB

<rssi>: Received Signal Strength Indication

<sinr >: signal to interference plus noise ratio

Example

```
AT+ZSRSP?
+ZSRSP:"-092.70","-08.70","-065.50","13"

OK
```

8.20. +ZRSP Query RSRP,RSRQ,SINR of LTE neighbor cell

This command is used to Query RSRP,RSRQ,SINR of LTE neighbor cell.

Note: This command is only available in LTE mode(you can configure by command AT+ZSNT=6,0,0 to lock the LTE mode), and it will return ERROR in other mode.. you can also send command AT+ZARFCN? To query the network register mode.

Command	Response
+ZRSP?	<CR><LF>+ZRSP:<rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,...,<sinr><CR><LF>

	<CR><LF>OK<CR><LF>

Parameters

<rsrpN>: RSRP, Reference Signal Received Power, is 10 times of real RSRP (is equal to the unit is 0.1dBm), If there are several neighbour cells, this AT command will return rsrp1, rsrp2, ... rsrpN (<rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,…,<rsrpN>,<rsrqN>), the max value of N is 8.

<rsrqN>: RSRQ, Reference Signal Received Quality, is 10 times of real RSRQ(is equal to the unit is 0.1dB), If there are several neighbour cells, this AT command will return<rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,…,<rsrpN>,<rsrqN>

<sinr>: signal to interference plus noise ratio, SINR. It is 10 times of real value, and only valid in LTE mode.

Example

```
AT+ZARFCN?
LTE: 2850

OK
AT+ZRSP?
+ZRSP:"-1031","-84""-1149","-174""-1094","-113""-1169","-187""-1031","-84",161

OK
```

8.21. +ZSRVRSP LTE Server cell query

LTE Server cell query, including: RSRP,RSRQ,SINR

This command is valid under LTE mode and returns ERROR under other mode.

Command	Response
+ZSRVRSP?	<CR><LF>+ZSRVRSP:<rsrp>,<rsrq>,<sinr><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR:<CR><LF>

Parameter

<rsrp>: Stirng type with quotes. Reference Signal Received Power

<rsrq>: Stirng type with quotes. Reference Signal Received Quality

<sinr>: signal to interference plus noise ratio， SINR

Example

```
//return rsrp,rsrq,sinr of serving cell
AT+ZSRVRSP?
+ZSRVRSP:"-107","-14",113

OK
```

8.22. +CGEQOS Define EPS quality of service

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

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

The test command returns the ranges of the supported parameters as compound values.

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

Parameter

<cid>: integer type; specifies a EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS

<QCI>: integer type; specifies a class of EPS QoS (see 3GPPTS23.203[85] and 3GPPTS24.301[83]).

0 QCI is selected by network

[1 – 4] value range for guaranteed bit rate Traffic Flows

75 value for guaranteed bit rate Traffic Flows

[5 – 9] value range for non-guaranteed bit rate Traffic Flows

79 value for non-guaranteed bit rate Traffic Flows

[128–254] value range for Operator-specific QCIs

The QCI values 65, 66, 69 and 70 are not allowed to be requested by the UE. If the TE requests a QCI parameter 65, 66, 69 or 70, the MT responds with result code +CME ERROR: 181 (unsupported QCI value).

<DL_GBR>: integer type; indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI.

<UL_GBR>: integer type; indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI .

<DL_MBR>: integer type; indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI .

<UL_MBR>: integer type; indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI.

Example

```
AT+CGEQOS=?
+CGEQOS: (1-24),(0-9),(0-150000),(0-50000),(0-150000),(0-50000)

OK
AT+CGEQOS=1,0
OK
AT+CGEQOS?
+CGEQOS: 1,0,0,0,0,0

OK
```

8.23. +ZMONI Get the information of main& neighbor cells*

This command is supported by firmware of or above ME3630E1CV1.0B10&ME3630J2AV1.0B10 and ME3630-A modules currently.

This command is used to get/set the information of main &neighbor cells.

Command	Response
+ZMONI=<n>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<err><CR><LF>
+ZMONI=?	<CR><LF>+ZMONI:(0-2)<CR><LF> <CR><LF>OK<CR><LF>
+ZMONI?	When <n>=0, the response is the information of main cell When register to LTE: <CR><LF>+ZMONI:<mode>,<s/n>,<earfcn>,<band>,<mcc>,<mnc>,<tac_id>,<cell_id>,<pci>,<rsrp>,<rsrq>,<rx_pwr>,<sinr>,<ecio><CR><LF> <CR><LF>OK<CR><LF> When register to WCDMA: <CR><LF>+ZMONI:<mode>,<s/n><uarfcn>,<band>,<mcc>,<mnc>,<lac_id>,<cell_id>,<psc>,<URA>,<rscp>,<rx_power>,<ecio><CR><LF> <CR><LF>OK<CR><LF> When register to GSM: <CR><LF>+ZMONI:<mode>,<s/n>,<arfcn>,<band>,<mcc>,<mnc>,<lac_id>,<cell_id>,<bsic>,<c1>,<c2>,<timadv>,<rx_power>,<sinr>,<ecio><CR><LF> <CR><LF>OK<CR><LF> When <n>=1, the response is the information of neighbor cells When neighbor cell is GSM, the GSM neighbor cells can be 6 at most: <CR><LF>+ZMONI:<mode>,<s/n>,<LAC>,<cell_id>,<ARFCN>,<rx_pwr><CR><LF> <CR><LF>OK<CR><LF> When neighbor cell is WCDMA, the WCDMA neighbor cells can be 16 at most: <CR><LF>+ZMONI:<mode>,<s/n>,<PSC>,<rscp>,<ecio>,<uarfcn>,<rx_pwr><CR><LF> <CR><LF>OK<CR><LF> When neighbor cell is LTE, the LTE neighbor cells can be 16 at most: <CR><LF>+ZMONI:<mode>,<s/n>,<rsrp>,<rsrq>,<physicalCellID>,<arfcn>,<rx_pwr><CR><LF> <CR><LF>OK<CR><LF> When <n>=2, the response is the information of neighbor cells and main cell. The response format can refer to the above.

Parameter

<n>: the supported range is 0-2

0 the response of AT+ZMONI? is the information of main cell

1 the response of AT+ZMONI? is the information of neighbor cells

2 the response of AT+ZMONI? is the information of neighbor cells and main cell.

<mode>:

GSM

UMTS: When register to WCDMA/TD-SCDMA

LTE

<s/n>:

s stands for the main cell

N1/N2/N3… stands for the first/second/third… neighbor cell.

<band>

	Parameter	Band
When the mode is GSM	0	EGSM_900
	1	PGSM_900
	2	PCS_1900
	3	Dcs_1800
	4	GSM_850
	5	Invalid band
	255	Not registered
When the mode is WCDMA	1	WCDMA EUROPE,JAPAN,and China IMT 2100 band
	2	WCDMA U.S. PCS 1900 band
	3	WCDMA EUROPE and China DCS 1800 band
	4	WCDMA U.S. 1700 band
	5	WCDMA U.S 850 band
	6	WCDMA Japan 800 band
	7	WCDMA Europe 2600 band
	8	WCDMA EUROPE and China 900 band
	9	WCDMA Japan 1700 band
	10	WCDMA BC10-1700 band
	11	WCDMA 1500 band
	12	WCDMA Japan 850 band
When the mode is LTE	1	LTE band 1
	3	LTE band 3
	5	LTE band 5
	7	LTE band 7
	8	LTE band 8
	20	LTE band 20
		The band is the numeric in this mode.

<earfcn/arfcn>: Absolute Radio Frequency Channel Number of the BCCH carrier

<mcc>: Mobile Country Code

<mnc>: Mobile Network Code

<tac_id>: Tracking Area Code

<cell_id>: Cell identify

<lac_id>: Location Area Code

<pci>: Physical cell ID

<bsic>: base station identification code

<psc>: primary Scrambling code

<uarfcn>: umts assigned radio channel

<URA>: UTRAN Registration Area Identity

<rscp>: Received Signal Code Power in dBm

<rsrp>: Reference Signal Received Power

<rsrq>: Reference Signal Received Quality

<c1>: C1 reselection parameter

<c2>: C2 reselection parameter

<timadv>: timing advance

<sinr>: Serving cell SINR information

<rx_power>: Receiving Signal strength in dBm(RSSI)

<ecio>: Pilot Strength

Example

```
//return ZMONI parameter range
AT+ZMONI=?
+ZMONI: (0-2)
OK
When <n>=0, and register to GSM, return the main cell information:
AT+ZMONI?
+ZMONI: mode: GSM, s, arfcn: 108, band: 0, mcc: 460, mnc: 1.lac id: 8422, cell id: 51396, bsic: 60, cl: 26, c2: 26, timeadv: 4294967295,
rx power: -69, sinr: 0, ecio: 0

OK
When <n>=0, and register to WCDMA, return the main cell information:
AT+ZMONI?
+ZMONI:mode:UMTS,s,uarfcn:10663, band:1,mcc:460,mnc:1,lac_id: 47901,cell_id:203242280, psc: 447, ura: 0, rscp: -85,rx_power:-85,
ecio:-6

OK
When <n>=0, and register to LTE, return the main cell information:
AT+ZMONI?
+ZMONI:mode:LTE,s,earfcn:1675,band:3,mcc:460,mnc:1,tac_id:37147,cell_id:196565553,pci:363,rsrp:-94.80,rsrq:-12.90,rx_power:-
63.40,sinr:138,ecio:0
OK
```

```
When <n>=1, and register to GSM, return the neighbour cells information:
AT+ZMONI?
+ZMONI: mode: GSM, N1, lac: 8422, cell_id: 51398, arfcn: 112, rx_power:0.00000
+ZMONI:mode:GSM,N2,lac:8422,cell_id: 53978, arfcn:659, rx_power:0.00000
+ZMONI:mode:GSM, N3, lac: 8422,cell_ id: 51397, arfcn: 117,rx_power:0.00000
+ZMON: mode GSM, N4, lac: 8422, cell-id: 53976, arfcn 667, rx power: 0. 000000
```

+ZMONI:mode:,N5,lac:8422,cell-id: 53977, arfcn: 676,rx_power:0.000000

OK

When <n>=1, and register to WCDMA, return the neighbour cells information:

AT+ZMONI?

+ZMONI: mode: UMTS, N1, psc: 308, rscp:-8t, ecio: -8, uarfcn: 10663, rx power: -66

+ZMONI:mode: UMTS, N2, psc: 292, rscp: -95, ecio: -16, uarfcn: 10663, rx_power:-66

OK

When <n>=1, and register to LTE, return the neighbour cells information:

AT+ZMONI?

+ZMONI:mode:LTE,N1,rsrp:-94.50,rsrq:-9.70,pci:363,earfcn:1675,rx_power:-66.40

+ZMONI:mode:LTE,N2,rsrp:-105.90,rsrq:-16.70,pci:374,earfcn:1675,rx_power:-79.70

OK

When <n>=2, and register to GSM, return the neighbour cells and main cell information:

AT+ZMONI?

+ZMONI: mode: GSM, s, arfcn: 108, band: 0, mcc: 460, mnc: 1.lac id: 8422, cell id: 51396, bsic: 60, cl: 26, c2: 26, timeadv: 4294967295, rx power: -69, sinr: 0, ecio: 0

+ZMONI: mode: GSM, N1, lac: 8422, cell_id: 51398, arfcn: 112, rx_power:0.00000

+ZMONI:mode:GSM,N2,lac:8422,cell_id: 53978, arfcn:659, rx_power:0.00000

+ZMONI:mode:GSM, N3, lac: 8422,cell_ id: 51397, arfcn: 117,rx_power:0.00000

+ZMON: mode GSM, N4, lac: 8422, cell-id: 53976, arfcn 667, rx power: 0. 000000

+ZMONI:mode:,N5,lac:8422,cell-id: 53977, arfcn: 676,rx_power:0.000000

OK

When <n>=2, and register to UMTS, return the neighbour cells and main cell information:

AT+ZMONI?

+ZMONI:mode:UMTS,s,uarfcn:10663, band:1,mcc:460,mnc:1,lac_id: 47901,cell_id:203242280, psc: 447, ura: 0, rscp: -85,rx_power:-85, ecio:-6

+ZMONI: mode: UMTS, N1, psc: 308, rscp:-8t, ecio: -8, uarfcn: 10663, rx power: -66

+ZMONI:mode: UMTS, N2, psc: 292, rscp: -95, ecio: -16, uarfcn: 10663, rx_power:-66

OK

When <n>=2, and register to LTE, return the neighbour cells and main cell information:

AT+ZMONI?

+ZMONI:mode:LTE,s,earfcn:1675,band:3,mcc:460,mnc:1,tac_id:37147,cell_id:196565553,pci:363,rsrp:-92.70,rsrq:-9.80,rx_power:-64.50,sinr:163,ecio:0

+ZMONI:mode:LTE,N1,rsrp:-92.70,rsrq:-9.80,pci:363,earfcn:1675,rx_power:-64.50

OK

9. Packet Domain Commands

9.1. +CGDCONT Define PDP Context

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. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.

NOTE: A special form of the set command, +CGDCONT=<cid>, causes the values for context number <cid>to become undefined.

Command	Response
+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<pd1>[,…[,pdN]]]]]]]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGDCONT?	<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,…[,pdN]]] [+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,…[,pdN]]]<CR><LF> [...]] <CR><LF>OK<CR><LF>
+CGDCONT=?	<CR><LF>+CGDCONT: (range of supported <cid>s),<PDP_type>,,,(list of supported<d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]]<CR><LF> [+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]]<CR><LF> [...]] <CR><LF>OK<CR><LF>

Parameter

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition.

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

IP Internet Protocol (IETF STD 5)

IPV6 Internet Protocol, version 6 (IETF RFC 2460)

PPP Point to Point Protocol (IETF STD 51)

IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPPTS24.301[83])

<APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.

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

If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The allocated address may be read using the +CGPADDR command.

<d_comp>: a numeric parameter that controls PDP data compression

0 off (default if value is omitted)

1 on (manufacturer preferred compression)

2 V.42bis

<h_comp>: a numeric parameter that controls PDP header compression (refer 3GPP TS 04.65)

0 off (default if value is omitted)

1 on (manufacturer preferred compression)

2 RFC1144

3 RFC2507

4 RFC3095 (applicable for PDCP only)

<pd1> … <pdN>: zero to N string parameters whose meanings are specific to the <PDP_type>

Example

```
AT+CGDCONT?
+CGDCONT: 1,"IP","uninet","0.0.0.0",0,0

OK
```

9.2. +CGATT PS attach or detach

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

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

The read command returns the current Packet Domain service state.

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

Command	Response
+CGATT=[<state>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGATT?	<CR><LF>+CGATT: <state><CR><LF> <CR><LF>OK<CR><LF>
+CGATT=?	<CR><LF>+CGATT: (list of supported <state>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<state>: indicates the state of PS attachment

0 detached

1 attached

Example

```
AT+CGATT?
+CGATT: 0

OK
```

9.3. +CGACT PDP context activate or deactivate

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

If no<cid>s are specified the activation form of the command activates all defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

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.

Command	Response
+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	<CR><LF>OK<CR><LF>

	or <CR><LF>+CME ERROR: <err><CR><LF>
+CGACT?	<CR><LF>+CGACT: <cid>,<state><CR><LF> [<CR><LF>+CGACT: <cid>,<state><CR><LF> [...]] <CR><LF>OK<CR><LF>
+CGACT=?	<CR><LF>+CGACT: (list of supported <state>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<state>: indicates the state of PDP context activation

0 deactivated

1 activated

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

Example

```
AT+CGACT?
+CGACT: 1,0
…

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

OK
```

9.4. +CGPADDR Show PDP address

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

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

Command	Response
+CGPADDR=[<cid> [,<cid> [,…]]]	<CR><LF>+CGPADDR: <cid>,<PDP_addr><CR><LF> [<CR><LF>+CGPADDR: <cid>,<PDP_addr><CR><LF> [...]] <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGPADDR=?	<CR><LF>+CGPADDR: (list of defined <cid>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

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

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address>: it is omitted if none is available.

Example

```
AT+CGPADDR=1
+CGPADDR: 1,10.245.21.75

OK
```

9.5. +CGEREP Packet Domain event reporting

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

Read command returns the current mode and buffer settings

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

Command	Response
+CGEREP=[<mode>[,<bfr>]]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGEREP?	<CR><LF>+CGEREP: <mode>,<bfr><CR><LF> <CR><LF>OK<CR><LF>
+CGEREP=?	<CR><LF>+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)<CR><LF> <CR><LF>OK<CR><LF>

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

✧ +CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

✧ +CGEV: NW REACT <PDP_type>, <PDP_addr>, [<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT.

✧ +CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]

The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

✧ +CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

✧ +CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

✧ +CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

✧ +CGEV: NW CLASS <class>

The network has forced a change of UE class. The highest available class is reported.

✧ +CGEV: ME CLASS <class>

The mobile termination has forced a change of UE class. The highest available class is reported.

Parameter

<mode>: controls the processing of unsolicited result codes specified within this command

0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the

TE

2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>:

0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered

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

Example

```
AT+CGEREP=?
+CGEREP: (0-2),(0-1)

OK
AT+CGEREP?
+CGEREP: 0,0

OK
```

9.6. +CGSMS Select service for MO SMS messages

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

Command	Response
+CGSMS=[<service>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CGSMS?	<CR><LF>+CGSMS: <service><CR><LF> <CR><LF>OK<CR><LF>
+CGSMS=?	<CR><LF>+CGSMS: (list of currently available <service>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<service>: a numeric parameter which indicates the service or service preference to be used

0 Packet Domain

1 circuit switched

2 Packet Domain preferred (use circuit switched if GPRS not available)

3 circuit switched preferred (use Packet Domain if circuit switched not available)

Example

```
AT+CGSMS?
+CGSMS: 1

OK
AT+CGSMS=?
+CGSMS: (0-3)
```

```
OK
```

9.7. +ZSDHCPLEASE Set DHCP LEASE TIME*

This command is supported on ME3630J2AV1.0B12, ME3630J2ASV1.0B05 and above version.

This command is used to control IP address lease time by amend NV(dhcp_lease_time) of AP. This command will take effect after restart.

Command	Response
+ZSDHCPLEASE=<dhcplease_time>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSDHCPLEASE=?	<CR><LF>+ZSDHCPLEASE:The value cannot be less than 120<CR><LF> <CR><LF>OK<CR><LF>
+ZSDHCPLEASE?	<CR><LF>+ZSDHCPLEASE:<dhcplease_time><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<dhcplease_time>: dhcpe_lease_time value, minimum value is 120, and default value is 43200(unit: s)

Example

```
AT+ZSDHCPLEASE=119                  //less than 120, response ERROR
ERROR

AT+ZSDHCPLEASE=180                  //set as 180s, that is 3 minutes
OK
at+zsdhcplease=?                    // dhcplease_time value should not less than 120s

+ZSDHCPLEASE:The value cannot be less than 120
OK

AT+ZSDHCPLEASE?                     //query current dhcplease_time value
+ZSDHCPLEASE:180

OK
```

10. Data Connection Relative Commands

10.1. Recommended Data Connection Commands

10.1.1. +ZDATACFG Define PDP call parameters

This command is used to set multi-channel APN (in TCP/FTP/HTTP/SSL/MQTT) function. This is extent command of GOSUNCN, and the function of this command equal to AT+CGDCONT.

Set command is used to set params of PDP call. And it will works after being set immediately, the set value is still effective after restart.

Query command is used to query the context of corresponding cid.

Note: this command can replace old command: +ZIPCFG, $QCPDPP

Command	Response
+ZDATACFG=<cid>,<ip_type>,<apn>,<auth_type>,<username>,<password>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZDATACFG?	<CR><LF>+ZDATACFG:<cid>,<ip_type>,<apn>,<auth_type>,<username>,<password><CR><LF> [+ZDATACFG:<cid>,<ip_type>,<apn>,<auth_type>,<username>,<password>]<CR><LF> [...]] <CR><LF>OK<CR><LF>
+ZDATACFG=?	<CR><LF>+ZDATACFG:(1-5),<ip_type>,<apn>,(0-3),<username>,<password><CR><LF> <CR><LF>OK<CR><LF>

Parameter:

<cid>: (1-5, PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition.

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

IP Internet Protocol version 4

IPV6 Internet Protocol, version 6

IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPPTS24.301[83])

<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.

<username>: Access point name

<password>: Access point password

Example

```
AT+ZDATACFG=1,"IP","ctnet",0,"","“
OK
AT+ZDATACFG?
+ZDATACFG: 1,"IP","ctnet",0,"",""
+ZDATACFG: 2,"IPV4V6","3gwap",0,"",""
+ZDATACFG: 3,"IPV4V6","",0,"",""
OK
```

10.1.2. +ZDATAACT Start Data Connection

This command is used to start data call of corresponding cid, and profile information of this cid can be set by "AT+ZDATACFG".

This command is mainly used in multi-APN dial, including TCP/FTP/HTTP/SSL/MQTT.

Note: This dialing instructions can replace the original dialing command: +ZIPCALL, $ZPDPACT, +ZPDPCALL.

Command	Response
+ZDATAACT=<cid>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZDATAACT?	<CR><LF>+ZDATAACT: <cid>,<addr_type>,<ip_addr>,<dnsp>,<dnss><CR><LF> <CR><LF>OK<CR><LF>
+ZDATAACT =?	<CR><LF>+ZDATAACT:(1-5)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<cid>: range 1-5.

<addr_type>: address type ”IPV4”;”IPV6”

<ip_addr>: IP address

<dnsp>: main dns

<dnss>: assist dns

Example

```
AT+ZDATAACT=2
OK
AT+ZDATAACT?
+ZDATAACT:2,"IPV4",10.229.201.200,211.137.130.2,211.137.130.4
+ZDATAACT:2,"IPV6",a001:2222:2409:8970:1091:52cf:1091:52cf,a001:2222:2409:8970:1091:52cf:1091:52cf,a001:2222:2409:8970:1091:52cf:1091:52cf
OK
```

10.1.3. +ZDATADEACT Start Data Disconnection

This command is used to disconnect PDP data connection of built-in protocol of corresponding cid.

Make sure there is no any data business before used this command to disconnect data connection.

Command	**Response**
+ZDATADEACT=<cid>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZDATADEACT=?	<CR><LF>+ZDATADEACT:(1-5)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<cid>: range 1-5.

Example

```
AT+ ZDATADEACT=2
OK
```

10.2. ECM Call Commands

10.2.1. +ZECMCALL Make ECM data call

This command used to make data call based on ECM interface. The data call parameter can be also configured by +CGDCONT command.

Command	Response
+ZECMCALL=<action>[,<APN>[,<PDP_type>[,<username>[,<passwd>[,<auth_type>]]]]]	<CR><LF>+ZECMCALL: CONNECT<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZECMCALL?	<CR><LF>+ZECMCALL: <ip_type>,<ip_addr>,<gateway>,<pri_dns>,<sec_dns><CR><LF> <CR><LF>OK<CR><LF>
+ZECMCALL=?	<CR><LF>+ZECMCALL: (0-1),,(1-3),,,(1-2) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<action>: a number used to control connect or disconnect the data call.

1 CONNECT

0 DISCONNECT

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

Note: Under LTE network, please refer the following process to change or set APN:

1.at+cgdcont=1,"IPV4V6","cmnet" //set ANP or IP type

2.AT+CFUN=0

3.AT+CFUN=1 // register network use the new APN

4.AT+ZECMCALL=1

<PDP_type>: A number used to control the type of packet data protocol

1 IPV4 Internet Protocol, version 4

2 IPV6 Internet Protocol, version 6

3 IPV4IPV6Internet Protocol, version 6&4

<username>: The string parameter username used to authentication

<passwd >: The string parameter password used to authentication

<auth_type>: a number used to control authentication type

1 PAP

2 CHAP

<ip_type>: ip type.

“V4” IPV4 address

“V6” IPV6 address

<ip_addr>: IP address

<gateway>: gateway address

<pri_dns>: primary DNS address

<sec_dns>: second DNS address

Example

```
AT+ZECMCALL=1
+ZECMCALL: CONNECT
```

```
OK
AT+ZECMCALL?
+ZECMCALL: IPV4, 1.1.108.220, 1.1.108.221, 192.232.9.24, 221.11.1.67

OK
```

10.2.2. +ZECMCALL active report the state of auto-dial

Enable auto-dial function, active report function default close.

This command is used to control ECM active report the state of auto-dial by change NV(ecmcall_urc) of AP. The command will take effect after restart.

Use at+znvwrite=ecmcall_urc,1 command to enable active report the state of auto-dial;

Use at+znvwrite=ecmcall_urc,0 command to disable active report the state of auto-dial;

Use at+znvread=ecmcall_urc command to query state of auto-report switch.

This command is supported on ME3630J2AV1.0B12, ME3630J2ASV1.0B05 and above version.

Command	Response
	<CR><LF>+ZECMCALL: CONNECTED<CR><LF> or <CR><LF>+ZECMCALL: DISCONNECTED, <type>,< code><CR><LF>

Parameter

<type>: call end reason type

<code>: call end reason code

Example

```
+ZECMCALL: CONNECTED

+ZECMCALL: DISCONNECTED,UE is detached

+ZECMCALL: DISCONNECTED,2003
```

10.2.3. +ZNVWRITE Enable auto-dial function

This command is supported on ME3630J2AV1.0B12 , ME3630J2ASV1.0B05 and above version.

This command is used to control ECM auto dial by change NV(auto_dial_mode) of AP. This command will take effect after restart the module. And only support auto-dial with IPV4 protocol.

You should switch USB port according to either command as follows before enable auto-dial function:

1) RNDIS mode: AT+ZSWITCH=x, AT+ZADSET=r

2) ECM mode: AT+ZSWITCH=l, AT+ZADSET=e

Command	**Response**
+ZNVWRITE=<type>,<value><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<type> string type, this value can be either of follows:

ecmcall_urc ECM Unsolicited report function

auto_dial_mode ECM auto-dial function

<value>:default void, means Enable/disable auto-dial/Unsolicited report function.

1 enable auto-dial/Unsolicited report function

0 disable auto-dial/Unsolicited report function

Use at+znvwrite=ecmcall_urc,1 command to enable active report the state of auto-dial;

Use at+znvwrite=ecmcall_urc,0 command to disable active report the state of auto-dial;

Use at+znvread=ecmcall_urc command to query state of auto-report switch.

Use at+znvwrite= auto_dial_mode,1----- enable ECM auto-dial

Use at+znvwrite= auto_dial_mode,0----- disableECM auto-dial

Example

```
AT+ZNVWRITE=auto_dial_mode,1      //open auto-dial function
OK
AT+ZECMCALL?                      //query ECM data dial state
+ZECMCALL: IPV4, 10.113.243.70, 10.113.243.69, 211.137.130.18, 211.137.130.20   //only support auto-dial under IPV4 protocol, auto-dial can be controlled after ECM data connect successfully

OK
AT+ZNVWRITE=auto_dial_mode,0      //close auto-dial function
OK
```

10.2.4. +ZNVREAD Query the state of auto-dial function

This command is supported on ME3630J2AV1.0B12 , ME3630J2ASV1.0B05 and above version.

This command can query whether the ECM auto-dial function is open or not by read the NV(auto_dial_mode) of AP.

Command	Response
+ZNVREAD=<type><CR>	<CR><LF>+ZNVREAD: <type>:<VALUE><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<type> string type, this value can be either of follows:

ecmcall_urc ECM Unsolicited report function

auto_dial_mode ECM auto-dial function

<value>:default void, means Enable/disable auto-dial/Unsolicited report function.

1 nable auto-dial/Unsolicited report function

0 disable auto-dial/Unsolicited report function

void default void, means close auto-dial function(when not set the +ZNVWRITE command)

Example

```
at+znvread=auto_dial_mode
+ZNVREAD: auto_dial_mode:

OK
```

```
AT+ZNVWRITE=auto_dial_mode,1


OK
AT+ZNVREAD=auto_dial_mode
+ZNVREAD: auto_dial_mode:1


OK
```

10.3. Reserved Data Connection Commands

10.3.1. +ZIPCFG Set and Query the params of PS Call

Extensible AT command, this command is used to Set and Query the params of PS Call.

Command	Response
+ZIPCFG=<APN>[,<Username>,<Password>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPCFG?	<CR><LF>+ZIPCFG:<APN>[,<User name>,<Password>]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<APN>: The Access Point Name.

<User name>: Usernanme when start a call

<Password>: Password when start a call

Example

```
AT+ZIPCFG=cmwap,username,passwd
OK
AT+ZIPCFG?
+ZIPCFG: cmwap,username,passwd


OK
```

10.3.2. $QCPDPP Set PDP Authentication parameters

This command is used to set the PDP Authentication parameters, that is the username/password assigned by network provider in LTE/WCDMA/TD-SCDMA/GSM mode. If there is no username/password, you don't need to set this command.

This command can be only used when the module has registered to network.

Command	Response
$QCPDPP=<cid>,<auth_type>,<password>,<username>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
$QCPDPP?	<CR><LF>$QCPDPP:<cid>,<auth_type>[,<username>]<CR><LF> [$QCPDPP: <cid>,<auth_type>[,<username>]<CR><LF> [...]]

	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
$QCPDPP=?	<CR><LF>$QCPDPP: (list of supported <cid>s),(list of supported <auth_type>s),,<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
$QCPDPP	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<cid> (1-24) a numeric parameter which specifies a PDP context definition

<auth_type>: a numeric parameter specified the Authentication type

0 Disable PDP Authentication

1 PAP

2 CHAP

3 PAP,CHAP auto

<password>: password assigned by network provider in LTE/WCDMA/TD-SCDMA/GSM

<user>: username assigned by network provider in LTE/WCDMA/TD-SCDMA/GSM

Example

```
AT$QCPDPP=2,3,"password","user"
OK
AT$QCPDPP?
$QCPDPP: 1,0
$QCPDPP: 2,3,"user"
$QCPDPP: 3,0
$QCPDPP: 4,0
$QCPDPP: 5,0

OK
AT$QCPDPP=?
$QCPDPP: (1-24),(0-3),,

OK
AT$QCPDPP
OK
```

10.3.3. +ZIPCALL Start or End PS Call

Extensible AT command, this command is used to Start or end PS Call, If PS call successful. It will report IP address automatically.

Command	Response

+ZIPCALL=<Action>	<CR><LF>OK<CR><LF> +ZIPCALL: <State>[,<IP address>] or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPCALL?	<CR><LF>+ZIPCALL:<State>[,<IPaddress>]<CR><LF> <CR><LF>OK<CR><LF>
+ZIPCALL=?	<CR><LF>+ZIPCALL: (list of supported <Action>s) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Action> :

0 end PS CALL

1 start PS CALL

<State>: Socket call connection state.

0 Disconnected

1 Connected

2 Connecting (should not be used to set)

3 Disconnecting (should not be used to set)

<IP address>: The IP address when connect to Network successful.

Example

```
AT+ZIPCALL=1
OK
+ZIPCALL: 1, 1.1.72.120
AT+ZIPCALL?
+ZIPCALL: 1, 1.1.72.120
OK
```

10.3.4. $ZPDPACT Activate/Deactivate PDP connection

When using FTP service, you need first activate PDP connection and get the assigned IP address.

Command	Response
$ZPDPACT=<action>	<CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>
$ZPDPACT=?	<CR><LF>$ZPDPACT: (0, 1) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<action>: Integer types

0 Deactivate PDP connection

1 ACTIVATE PDP connection

Example

```
AT+CSQ
+CSQ: 16,99

OK
```

```
AT+ZPAS?                              //The module register to network
+ZPAS: "LTE","CS_PS", “FDD”

OK
AT+CGDCONT=1,"IP","CTNET"          //Use SIM card of China telecom, APN is CTNET. You can set the APN according to the operator.

OK
AT$ZPDPACT=1          //ACTIVATE PDP connection
OK
AT$ZPDPACT=?
$ZPDPACT: (0, 1)
OK
```

11. GPS Relative Commands*

11.1. +ZGINIT Initialization Location command

Init a client for GPS application.

Command	Response
+ZGINIT	<CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>

Example

```
AT+ZGINIT
OK
```

11.2. +ZGMODE Set location mode

This command is used for set location mode by user.

Command	Response
+ZGMODE=<flag>	<CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGMODE?	<CR><LF>+ZGMODE: <flag><CR><LF> <CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGMODE=?	<CR><LF>+ZGMODE: (1-3)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<flag>:

1 MS-BASED

2 MS-ASSISTED (Note: AGPS does not support MSA mode currently.)

3 STANDALONE_ONLY(Default Value)

Example

```
AT+ZGMODE=1
OK
AT+ZGMODE=?
+ZGMODE: (1-3)

OK
```

11.3. +ZGFIXRATE Set location mode choice when reset GPS

This command is used to set location mode choice when reset GPS.

Command	Response
+ZGFIXRATE=<flag1>,<flag2>	<CR><LF>OK<CR><LF> or MS error: <CR><LF> ERROR<CR><LF>
+ZGFIXRATE?	<CR><LF>+ZGFIXRATE: <flag1>,<flag2><CR><LF> <CR><LF>OK<CR><LF> or MS error: <CR><LF>ERROR<CR><LF>
+ZGFIXRATE=?	<CR><LF>+ZGFIXRATE: (1-100000),(1-255)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<flag1>: Set location mode when reset GPS by using AT+ZGRST, Default value is 1, range 1~100000.

1 one-shot mode,

others tracking mode.

<flag2>: Positioning time interval in second, default value is 1, the range is 1-255.This parameter has been abandoned.

Example

```
AT+ZGFIXRATE=2,5
OK
AT+ZGFIXRATE?
+ZGFIXRATE: 2,5

OK
```

11.4. +ZGQOS Set QOS for location

This command used for set QOS for location.

Command	Response
+ZGQOS=<flag1>,<flag2>	<CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGQOS?	<CR><LF>+ZGQOS: <flag1>,<flag2><CR><LF> <CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGQOS=?	<CR><LF>+ZGQOS: (2-10000),(0-255)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<flag1>: Positioning accuracy (default: 50), the range is 2-10000

<flag2>: Desired level of performance. (0-255) (default: 255)

Example

```
AT+ZGQOS=50,100
OK
AT+ZGQOS?
+ZGQOS: 50,100

OK
```

11.5. +ZGURL Set URL of SUPL server

This command used for Set URL of SUPL server.

Command	Response
+ZGURL=<flag>	<CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGURL?	<CR><LF>+ZGURL: <flag><CR><LF> <CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>

Parameter

<flag>: SUPL server URL

Example

```
AT+ZGURL= http://supl.google.com:7276
OK
AT+ZGURL?
+ZGURL: http://supl.google.com:7276

OK
```

11.6. +ZGRUN Location mode choice

Start or stop GPS Application, and choice one-shot or tracking mode location mode.

Command	Possible response
+ZGRUN=<flag>	<CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGRUN?	<CR><LF>+ZGRUN: <running_state><CR><LF> <CR><LF>OK<CR><LF>
+ZGRUN=?	<CR><LF>+ZGRUN: (0-2)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<flag>:

0 Stop GPS location command

1 Start one-shot location mode

Note: When set <flag>=1, if +ZGPSR unsolicited report is enabled, at this time, only when the positioning is successful, the +ZGPSR will report one time; if positioning is unsuccessful, +ZGPSR won't report. If the NMEA report is enabled (+ZGNMEA is not 0), the NMEA data is always reported during the positioning process. After the successful positioning, the NMEA data positioning is stopped.

2 Start tracking mode (not applicable for MSA), controlled by MS

<running_state>:

0 GPS is off

1 GPS is on and in one-shot location mode

2 GPS is on and in tracking mode

Example

```
AT+ZGRUN=0
OK
```

11.7. +ZGPSERROR Report error code

Report error code when some error happens in location process

Command	Response
	<CR><LF>+ZGPSERROR: <flag><CR><LF>

Parameter

<flag>:

0 ERROR_ACCESS_DENIED

1 ERROR_ BAD_NET_RESP

2 ERROR_ BUSY

3 ERROR_ CANCELLED

4 ERROR_ CONNECTION_ABORTED

5 ERROR_ CONTINUE

6 ERROR_ FATAL_ERROR

7 ERROR_ GEN_FAILURE

8 ERROR_ INCORRECT_ADDRESS

9 GPS_ERR_INSUFFICIENT_SAT_SIGNAL

10 ERROR_ INVALID_CATEGORY

11 ERROR_ INVALID_PARAMETER

12 ERROR_ NETWORK_UNREACHABLE

13 ERROR_ NOT_AUTHENTICATED

14 ERROR_ NOT_CONNECTED

15 ERROR_ REQUEST_ABORTED

16 ERROR_ RETRY

17 ERROR_ OUTOFMEMORY

18 ERROR_ TIMEOUT

19 ERROR_ RADIO_OFF

Example

```
+ZGPSERROR: 3
```

11.8. +ZGRST Reset GPS

Asynchronous instruction. This command executes GPS reset.

Command	Response
+ZGRST=<mode>	When restart success, return: <CR><LF>OK<CR><LF> <CR><LF>+ZGRST: OK<CR><LF> When set different modes, the time for +ZGRST returning is different, 20 second for cold restart. When failed to start searching ephemeris, return: <CR><LF>OK<CR><LF> <CR><LF>+ZGRST: ERROR<CR><LF> MS error: <CR><LF>ERROR<CR><LF>
+ZGRST=?	<CR><LF>+ZGRST: (0-2)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>:

0 Cold restart

1 Warm restart

2 Hot restart

NOTE: This command should be operated when GPS is enabled. The location mode is determined by AT+ZGFIXRATE. It is recommended that the customer use at+zgrst=0 for cold start in the first positioning after ME3630's position changes greatly (more than 100 kilometers) and instrument test scenarios.

Example

```
AT+ZGRST=1
OK

+ZRST: OK
```

11.9. +ZGPSAPN Set AGPS APN

This command is used to set the APN of AGPS. And this set command will take effect once setting. The setting value will be saved after restart.

Command	Response
+ZGPSAPN=<id>,<PDP_type>,<APN>[,<srv_system_type>]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZGPSAPN?<CR>	<CR><LF>+ZGPSAPN:<id>,<PDP_type>,<APN>,<srv_system_type><CR><LF> [+ZGPSAPN:<id>,<PDP_type>,<APN>,<srv_system_type>]<CR><LF> [...]] <CR><LF>OK<CR><LF>

	or <CR><LF>ERROR<CR><LF>
+ZGPSAPN=? <CR>	<CR><LF>+ZGPSAPN:(1-6),,,(0x1-0x1F)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<id>: (1-6), used to assign one APN configuration, a strip of configuration for one type of network, recommend to set as 1

<PDP_type>: used to assign data protocol, recommend to fit to net type

IPV4 Internet protocol V4

IPV6 Internet protocol V6

IPV4V6 Internet protocol V4V6

PPP PPP

<APN>: used to choose APN when A-GPS location, recommend to fit net type

<srv_system_type>: the parameter only supports hex, range is 0x1~0x1F. used to choose net type, values are shown as follows, can set one or more at the same time, default value is 01xC(0x10+0x8+0x4, means net set is GSM+WCDMA+LTE), recommend value is 0x1C

0x1 CDMA

0x2 HDR

0x4 GSM

0x8 WCDMA

0x10 LTE

Example

```
Setting Command
AT+ZGPSAPN=1,IPV4V6,3gnet,0x1C
OK
Query command
AT+ZGPSAPN?
+ZGPSAPN: 1,IPV4V6,3gnet,0x1C

OK
Test command
AT+ZGPSAPN=?
+ZGPSAPN:(1-6),,,(0x1-0x1F)

OK
```

11.10. +ZGPORT Set GPS information report port.

This command is used to set GPS information report port, take effective immediately after be set, and not saved when the module restarts.

Command	Response
+ZGPORT=[<n>]	<CR><LF>OK<CR><LF> or <CR><LF>+ZGPORT ERROR: <err><CR><LF>

+ZGPORT?	<CR><LF>+ZGPORT: <n><CR><LF> <CR><LF>OK<CR><LF>
+ZGPORT=?	<CR><LF>+ZGPORT: (list of supported <n>s) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n>: integer, default 0, that is information report from AT/MODEM/UART at the same time

0 GPS information report from AT/MODEM/UART at the same time

1 GPS information report from AT port only

2 GPS information report from MODEM port only

3 GPS information report from UART port only

11.11. +ZGMEASURE Report satellites measurements

Report ephemeris data mask, almanac data mask, searched satellite number and satellite signal strength.

It 's an URC command, not supported write & read operation.

Note: the module will get the location data only if there are more than four searched satellites with well signal strength.

Command	Response
	<CR><LF>+ZGMEASURE: <flag1>,<flag2>,<flag3>,<flag4>,<flag5>,<….><CR><LF>

Parameter

Flag	Explanation	Data type
Flag1	Eph_svmask, ephemeris data mask	Unsigned 32 bit value
Flag2	Alm_svmask, almanac data mask	Unsigned 32 bit value
Flag3	Sv_num, the searched satellite number	Unsigned 8 bit value
Flag4	Prn, SV ID, the first searched satellite ID	Unsigned 8 bit value
Flag5	Cn0, the first searched satellite signal strength, the unit is 0.1dB	Unsigned 16 bit value
Flag 6	Prn, SV ID, the second searched satellite ID	Unsigned 8 bit value
Flag 7	Cn1, the second searched satellite signal strength, the unit is 0.1dB	Unsigned 16 bit value
……		
Flag 2*(Sv_num)+2	Prn, SV ID, the Sv_num searched satellite ID	Unsigned 8 bit value
Flag 2*(Sv_num)+3	Cn1, the Sv_num searched satellite signal strength, the unit is 0.1dB	Unsigned 16 bit value

Example

```
+ZGMEASURE:536870980,-
513,25,3,281,4,180,7,259,30,270,40,324,1,0,6,0,8,0,9,0,15,0,16,0,17,0,18,0,22,0,28,0,32,0,86,320,73,226,75,119,83,196,85,144,70,0,69,
0,84,0,68,0
```

NOTE: This AT command has some differences(increase the following function) inLTE Module as follows:

Set GPS ZGMEASURE Report enable or not.

Command	Response
+ZGMEASURE=<status>	<CR><LF>OK<CR><LF>
+ZGMEASURE?	<CR><LF>+ZGMEASURE: <status><CR><LF>

	<CR><LF>OK<CR><LF>
+ZGMEASURE=?	<CR><LF>+ZGMEASURE: (0-1)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<status>:

1 enable

0 disable

Example

```
AT+ZGMEASURE=1
OK
AT+ZGMEASURE?
+ZGMEASURE: 1

OK
```

11.12. +ZGPSR Report Location Data

Report UTC time, lon, lat and speed Example

Response
<CR><LF>+ZGPSR:<UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat><CR><LF>

Parameter

<UTC>: UTC time (hhmmss.sss) referred to GGA sentence

<latitude>: format is ddmm.mmmm N/S (referred to GGA sentence), where:

dd degrees, 00..90

mm.mmmm minutes, 00.0000..59.9999

N/S North / South

<longitude>: format is dddmm.mmmm E/W (referred to GGA sentence), where:

Ddd degrees, 000..180

mm.mmmm minutes, 00.0000..59.9999

E/W East / West

<hdop>: x.x - Horizontal Diluition of Precision (referred to GGA sentence)

<altitude>: x.x Altitude - mean-sea-level (geoid) in meters (referred to GGA sentence)

<fix>:

0 Invalid Fix

2 2D fix

3 3D fix

<cog>: ddd.mm, Course over Ground (degrees, True) (referred to VTG sentence), where:

ddd degrees, 000..360

mm minutes, 00..59

<spkm>: x.x Speed over ground (Km/hr) (referred to VTG sentence)

<spkn>: x.x- Speed over ground (knots) (referred to VTG sentence)

<date>: ddmmyy Date of Fix (referred to RMC sentence), where:

dd day, 01..31

mm month, 01..12

yy year, 00..99 - 2000 to 2099

<nsat>: Total number of satellites in use (referred to GGA sentence)

nn 00..12

Example

```
+ZGPSR: 063309.800,3411.2655N,10852.5821E,3.3,357.3,2,154.12,0.3,0.5,160812,04    //when location successfully
,,,,,0,,,,,                    //when not fixed position
```

11.13. +ZGPSR Enable/Disable +ZGPSR report

Set ZGPSR Report of GPS enable or not.

Command	Response
+ZGPSR=<status>	<CR><LF>OK<CR><LF>
+ZGPSR Query the position result during the positioning process	If location is successful, return OK and positioning results <CR><LF>+ZGPSR:<UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat><CR><LF> <CR><LF>OK<CR><LF> If location is failed, only return OK: <CR><LF>OK<CR><LF>
+ZGPSR?	<CR><LF>+ZGPSR: <status><CR><LF> <CR><LF>OK<CR><LF>
+ZGPSR=?	<CR><LF>+ZGPSR: (0-1)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<status>:

1 enable

0 disable

The details of parameters: <UTC>,<latitude>,<longitude>,<hdop>,<altitude>,<fix>,<cog>,<spkm>,<spkn>,<date>,<nsat>, you can refer to +ZGPSR unsolicited command.

Example

```
AT+ZGPSR=1
OK
AT+ZGPSR?
+ZGPSR: 1

OK
AT+ZGPSR
+ZGPSR: 063309.800,3411.2655N,10852.5821E,3.3,357.3,2,154.12,0.3,0.5,160812,04

OK
```

11.14. +ZGXTRA Set XTRA positioning mode

This command is used to set XTRA feature. The XTRA feature requires the module to synchronize the network time, and the XTRA data file needs to be downloaded through the network. If the system determines that the time is invalid or the XTRA data file is invalid,

the update operation will be performed.

The command is only supported by firmware of or above ME3630E1CV1.0B19/GM500U1AV1.0B05/ME3630A1CV1.0B03 currently.

Note:

1. Since the GPS+XTRA function needs to download XTRA documents from the network, it is necessary to first dial the ECM, the module will automatically dial, no manual dialing is required.
2. Please send AT+ZGINIT to initialize before executing this command.
3. After the network status is good and the dialing is normal, the setting command timeout period does not exceed 15 seconds, depending on the network status.
4. Until the AT+XTRA command reports +ZGXTRA: INJECT XTRA DATA SUCCESS, you need to send AT+XTRA all the time.

Command	Response
+ZGXTRA	<CR><LF>+ZGXTRA: INJECT XTRA DATA SUCCESS<CR><LF> <CR><LF>OK<CR><LF> MS error: <CR><LF>ERROR<CR><LsF> When the time is not synchronized: <CR><LF>+ZGXTRA: TIME INVALID, START UPDATE<CR><LF> <CR><LF>OK<CR><LF> When the XTRA data file is invalid or does not exist: <CR><LF>+ZGXTRA: XTRA DATA FILE INVALID, START GET<CR><LF> <CR><LF>OK<CR><LF>
+ZGXTRA?	XTRA DATA VALID: <CR><LF>+ZGXTRA: XTRA DATA VALID<CR><LF> <CR><LF>OK<CR><LF> XTRA DATA INVALID: <CR><LF>+ZGXTRA: XTRA DATA INVALID<CR><LF> <CR><LF>OK<CR><LF>

Example

```
GPS+XTRA Location example:
AT+ZGINIT                    //Init GPS
OK
AT+ZGXTRA
+ZGXTRA: TIME INVALID, START UPDATE
OK
AT+ZGXTRA
+ZGXTRA: TIME INVALID, START UPDATE
OK
+ZGXTRA: TIME UPDATE SUCCESS
AT+ZGXTRA
+ZGXTRA: XTRA DATA FILE INVALID, START GET
OK
+ZGXTRA: XTRA DATA FILE GET SUCCESS
AT+ZGXTRA
+ZGXTRA: INJECT XTRA DATA SUCCESS
OK
```

```
AT+ZGXTRA?
+ZGXTRA: XTRA DATA VALID
OK

AT+ZGPSR=1
OK
AT+ZGQOS=20,255
OK
AT+ZGMODE=3
OK
AT+ZGPORT=0
OK
AT+ZGNMEA=31
OK
AT+ZGRUN=2
OK
```

11.15. +ZGNMEA Set the reported NMEA format of GPS data

The set command is used to set the NMEA format of GPS data. And it will take effect once sent until power off.

Read command is used to show the reported message of NMEA, and it will return 0 when there is no reported message.

Note: this command is only supported by the newest software firmware is or above ME3630U1AV1.0B12

Command	Response
+ZGNMEA=<value>	<CR><LF>OK<CR><LF>
+ZGNMEA?	<CR><LF>+ZGNMEA: <GGA>,<RMC>,<GSV>,<GSA>,<VTC><CR><LF> <CR><LF>OK<CR><LF>
+ZGNMEA=?	<CR><LF>+ZGNMEA: (0-31)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<value>: Set the reported NMEA format

1 GGA

2 RMC

4 GSV

8 GSA

16 VTG

<value> is the summation of all the reported message. For example, if the GGA and VTG message are needed, the <value> must be set to 17(=16+1); The default value of <value> is 0, that to say no reported NMEA message in default.

Example

```
AT+ZGNMEA?
+ZGNMEA:GGA,RMC,GSV,GSA,VTG

OK
```

```
$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E

$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E

$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E
```

```
$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,,*1E

$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,,*1E

$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D

$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73
```

```
$GPVTG,,T,,M,,N,,K,N*2C

$GPGSA,A,1,,,,,,,,,,,,,*1E

$GPGGA,,,,,,0,,,,,,,,*66

$GPRMC,,V,,,,,,,,,,N*53

$GPGSV,4,1,16,04,,,36,09,07,319,37,16,76,282,32,23,42,309,29*42

$GPGSV,4,2,16,26,62,028,42,31,35,075,36,03,56,118,,05,,,*4A

$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E

$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73

$GPGGA,065354.10,3411.295840,N,10852.586794,E,1,05,1.2,411.9,M,-28.0,M,,*4A

$GPVTG,0.0,T,3.1,M,0.0,N,0.0,K,A*21

$GPRMC,065354.10,A,3411.295840,N,10852.586794,E,0.0,0.0,180317,3.1,W,A*23

$GPGSA,A,2,09,16,23,26,31,,,,,,,,1.5,1.2,0.8*35

AT+ZGNMEA=15
OK
AT+ZGNMEA?
+ZGNMEA:GGA,RMC,GSV,GSA,0

OK
```

11.15.1. Syntax of NMEA

The telecom sentences specified in NEMA communication protocol are based on ASCII codes. The data syntax of NMEA-0183 protocol sentences are as follows:

"$" is the starting sign of a sentence;

"," is the parameter separator;

"*" is the check code identifier;

The last two digits are the check code.

The check code is XOR of all characters between "$" and "*" (excluding these two);

End with <CR><LF>.

All sentences must end with a carriage return, which is "Carriage return" and "Line feed" of ASCII character.

Message parameters of NMEA output/input:

Field	Example	Contents
Start string	$GPGGA	message identifier
Valid data	<Data>	parameters relating to message
Check code	*check code	The check code contains two ASCII characters (hexadecimal values)
End string	<CR><LF>	Each message ends with<CR><LF>
Note: All fields must exist, but the valid data parameter can be null (null between separator”,” or “*”)		

11.15.2. Standard NMEA output sentence

Common NMEA output sentences:

Sentence	Description	Possible prefix identifier
GGA	Time, position and fix type data	GP
GSA	GNSS receiver operating mode, satellites used in the position solution, and DOP values)	GP,GN,BD
GSV	Number of GNSS satellites in view, satellite ID numbers, elevation, azimuth, & SNR values	GP,GL,BD
RMC	ime, date, position, course and speed data	GP,GN
VTG	Course and speed information relative to the ground	GP
Note: 1. The prefix “GP” stands for Global Positioning System; 2. The prefix “GN” stands for Global Navigation Satellite System; 3. The prefix “GL” stands for GLObalnaya NAvigatsionnaya Sputnikovaya Sistema; 4. The prefix “BD” stands for BeiDou Navigation Satellite System. 5. The prefix “GA” stands for GALILEO Navigation Satellite System. 4. The prefix “PQ” stands for QZSS Navigation Satellite System. There are detailed descriptions of standard NMEA sentences in the following chapters.		

11.15.3. GGA sentence

Example: $GPGGA,065354.10,3411.295840,N,10852.586794,E,1,05,1.2,411.9,M,-28.0,M,,*4A<CR><LF>			
String name	Example	Unit	Description
Message ID	$GPGGA		GGA sentence header
UTC time	065354.10	Hour/Minute/Second	
Latitude	3411.295840	Degree/Point	
North/South	N		N= North or S=South

Longitude	10852.586794	Degree/Point	
East/West	E		E=East or W=West
Positioning type indication	1		0: invalid positioning or positioning failed 1: SPS mode, valid positioning 2: DSPS mode, valid positioning
Participated navigation satellites	05		Ranging from 0 to 12
Horizontal dilution of precision	1.2		horizontal dilution of precision
Height	411.9	Meter	Height based on average sea level
Unit	M	Meter	Height unit based on average sea level
Geoidal rise	-28.0	Meter	Difference value between geoid and spheroid: Spheroid height= Height based on average sea level+ Geoidal rise
Unit	M	Meter	Unit of Geoidal rise
Differential correction age		Second	0 or null as DGPS is not used
Differential station ID			Differential station ID
Check code	*4A		Check code
Sentence terminator	<CR><LF>		Carriage return and Line feed

11.15.4. GSA sentence

Example: $GPGSA,A,2,09,16,23,26,31,,,,,,,,1.5,1.2,0.8*35<CR><LF>			
String name	Example	Unit	Description
Message ID	$GPGSA		GSA sentence header
Mode1	A		M: Manual–manual setting in 2D or 3D mode A: Automatic– automatic switching between 2D and 3D allowed
Mode2	2		1: positioning failed 2: 2D positioning(more than 4 satellites participating in positioning) 3: 3D positioning (more than 3 satellites participating in positioning)
Participated navigation satellite [1]	09		Satellite No. in Passage 1
Participated navigation satellite [1]	16		Satellite No. in Passage 2
……			……

Participated navigation satellite [1]			Satellite No. in Passage 12
Position dilution of precision [2]	1.5		
Horizontal dilution of precision[2]	1.2		
Vertical dilution of precision [2]	0.8		
Check code	*3D		Check code
Sentence terminator	<CR><LF>		Carriage return and Line feed

11.15.5. GSV sentence

Example:
$GPGSV,4,1,16,04,,,36,09,07,317,37,16,76,282,32,23,42,309,28*4D<CR><LF>
$GPGSV,4,2,16,26,62,028,42,31,35,075,35,03,56,118,,05,,,*49<CR><LF>
$GPGSV,4,3,16,06,51,108,,08,04,281,,10,26,248,,11,,,*4E<CR><LF>
$GPGSV,4,4,16,12,74,009,,13,40,317,,18,07,194,,19,39,135,*73<CR><LF>

String name	Example	Unit	Description
MessageID	$GPGSV		GSV sentence header
Total number of sentences	4		Total number of this group of GSV sentences
Sentence Sequence No.	1		The sequence no. of the sentence in this group of GSV sentences
Number of visible satellites	16		The number of this type of visible satellites
Satellite No.	26		Satellite No. in Passage 5
Elevation angle	62	Degree	Satellite passage5's elevation angle (up to 90°)
Azimuth angle	028	Degree	Satellite passage 5's azimuth angle (true north, ranging from 0 to 359°)
Signal strength	42	dBHz	Satellite passage5's signal strength. Ranging from 0 to 99, null as the satellite is not captured
……			……
Satellite No.	03		Satellite No. in Passage 8
Elevation angle	56	Degree	Satellite passage 8's elevation angle (up to 90°)
Azimuth angle	118	Degree	Satellite passage 8's azimuth angle (true north, ranging from 0 to 359°)
Signal strength		dBHz	Ranging from 0 to 99, null as the satellite is not captured
Check code	*49		Check code
Sentence terminator	<CR><LF>		Carriage return and line feed

11.15.6. RMC sentence

Example: $GPRMC,083545.000,A,2233.4295,N,11356.7482,E,0.10,231.24,191213,,,A*6C<CR><LF> $GPRMC,065354.10,A,3411.295840,N,10852.586794,E,0.0,0.0,180317,3.1,W,A*23<CR><LF>			
String name	Example	Unit	Description
MessageID	$GPRMC		RMC sentence header
UTC time	065354.10	Hour/Minute/Second	
Status [1]	A		A= valid data V= invalid data
Latitude	3411.295840	Degree/point	
North/South	N		N=North or S=South
Longitude	10852.586794	Degree/point	
East/West	E		E=East or W=West
Speed over the ground	0.0	Knot	Ground speed
Azimuth angle above the ground	0.0	Degree	Azimuth angle marching to the ground
Date	180317	Day/Month/Year	
Magnetic declination angle [2]	3.1	Degree	Magnetic declination angle
East/West [2]	W		E=East or W=West
Mode	A		A=Autonomous D=Differential DGPS
Check code	*23		Check code
Sentence terminator	<CR><LF>		Carriage return and line feed

11.15.7. VTG sentence

Example: $GPVTG,231.24,T,,M,0.10,N,0.18,K,A*33<CR><LF> $GPVTG,0.0,T,3.1,M,0.0,N,0.0,K,A*21<CR><LF>			
String name	Example	Unit	Description
MessageID	$GPVTG		VTG sentence header
Azimuth angle	0.0	Degree	Azimuth angle

Reference	T		T represents True North
Azimuth angle	3.1	Degree	Azimuth angle
Reference	M		M represents Magnetic North
Speed	0.0	Knot [2]	Horizontal speed measured
Unit	N		N represents Knot [2]
Speed	0.0	Km/Hour [2]	Vertical speed measured
Unit	K		K represents: Km/Hour
Mode	A		A= Autonomous D=DGPS
Check code	*21		Check code
Sentence terminator	<CR><LF>		Carriage return and line feed
Note: 1. It doesn't support Magnetic Declination Angle output. < Azimuth angle above the ground > is relative to the true north's output of WGS-84 coordinate system. 2. 1 Knot is equal to 1.852 Km/hour.			

11.16. +ZGNMEAREQ Query Specified NMEA message

This command is used to query the specified NMEA message. The specified NMEA message is reported only once when query.

Command	Response
+ZGNMEAREQ=<value>	<CR><LF>+ZGNMEAREQ:<CR><LF> <CR><LF>$...<CR><LF> <CR><LF>OK<CR><LF>
+ZGNMEAREQ?	<CR><LF>+ZGNMEAREQ: <GGA>,<RMC>,<GSV>,<GSA>,<VTC><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<value>: Set the reported NMEA format

1 -GGA

2 - RMC

4-GSV

8-GSA

16-VTG

<value> is the summation of all the reported message. For example, if the GGA and VTG message are needed, the <value> mustbe set to 17(=16+1);

Note: When using at+zgnmeareq? to query, if the NMEA messagehas been set before, the display will be displayed as a character, otherwise it will be displayed as 0. For example, at+zgnmeaereq=17, when using at+zgnmeareq? query, it is displayed as +ZGNMEAREQ: GGA, 0,0,0, VTG

Example

```
AT+ZGNMEAREQ=1
+ZGNMEAREQ:
```

```
$GPGGA,,,,,,0,,,,,,,,*66
OK
AT+ZGNMEAREQ=2
+ZGNMEAREQ:
$GPRMC,,V,,,,,,,,,,N*53
OK
AT+ZGNMEAREQ=3
+ZGNMEAREQ:
$GPGGA,,,,,,0,,,,,,,,*66
$GPVTG,,T,,M,,N,,K,N*2C
OK
AT+ZGNMEAREQ=31
+ZGNMEAREQ:
$GPGGA,,,,,,0,,,,,,,,*66
$GPRMC,,V,,,,,,,,,,N*53
$GPGSA,A,1,,,,,,,,,,,,,,,*1E
$GPVTG,,T,,M,,N,,K,N*2C
OK
AT+ZGNMEAREQ?
+ZGNMEAREQ: GGA,RMC,GSV,GSA,VTG
OK
```

11.17. GPS Example

```
AT+CPIN?                    // Query SIM Card status
+CPIN: READY

OK
AT+CSQ                      //Query Signal Strength
+CSQ: 15,99

OK
AT+CREG?                    //Query Network status
+CREG: 0,1

OK
AT+ZGINIT                   //Init GPS
OK
AT+ZGPSR=1                  // Enable +ZGPSR report
OK
AT+ZGPSAPN=1,IPV4V6,ctnet,0x1C      //Set AGPS's APN
OK
```

```
AT+ZGURL=supl.qxwz.com:7275                    //Set SUPL
OK
AT+ZGQOS=20,255                                //Set location Qos
OK
AT+ZGMODE=3                                    //Set location mode
OK
AT+ZGPORT=0          // GPS information report from AT/MODEM/UART at the same time
OK
AT+ZGNMEA=31             // Set the reported NMEA format of GPS data
OK
AT+ZGRUN=1                  //Start one-shot location mode
OK
$GPVTG,,T,,M,,N,,K,N*2C
$GPGSA,A,1,,,,,,,,,,,,,,*1E
$GPGGA,,,,,,0,,,,,,,,*66
$GPRMC,,V,,,,,,,,,,N*53
$GPGSV,4,1,14,02,,,,03,,,,06,00,237,,09,68,133,*7E
$GPGSV,4,2,14,10,41,316,,14,64,306,,19,09,244,,22,,,*4B
$GPGSV,4,3,14,23,21,261,,25,02,158,,27,02,286,,28,00,043,*73
$GPGSV,4,4,14,31,58,167,,32,22,264,*72
+ZGMEASURE:
67109376,3445891878,28,2,0,3,0,6,0,9,0,10,0,14,0,19,0,22,0,23,0,25,0,27,0,28,0,31,0,32,0,78,393,85,363,68,281,70,0,6
9,0,84,0,83,0,201,0,202,0,206,0,214,0,216,0,226,0,193,289
+ZGPSR: 031154.00,3411.062779N,10852.697990E,2.6,544.0,2,4.6,0.0,0.0,090119,01

AT+ZGNMEAREQ=31
+ZGNMEAREQ:
$GPGGA,,,,,,0,,,,,,,,*66
$GPRMC,,V,,,,,,,,,,N*53
$GPGSA,A,1,,,,,,,,,,,,,,*1E
$GPVTG,,T,,M,,N,,K,N*2C
OK
```

Note: Due to document space limitations, the GPS data in this example is not fully intercepted, only the intercepted part is used for reference guidance.

12. Hardware Relative Commands

12.1. +CCLK Clock Management

Read command returns the current setting of the clock.

Test command returns the OK result code.

Command	Response
+CCLK?	<CR><LF>+CCLK: <time><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+CCLK=?	<CR><LF>OK<CR><LF>

Parameter

<time>: string type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -47...+48). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

NOTE: If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?.

Example

```
AT+CCLK?
+CCLK: "14/09/11,16:54:15+08"

OK
```

12.2. +ZTURNOFF Turn Off the Modem

This command is used to turn off the modem. Module will deactivate PDP, release all resources, and then shut down.

Command	Response
+ZTURNOFF	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Note: It's better to execute "AT+ZTURNOFF" before power off the module.

Example

```
AT+ZTURNOFF
OK
```

12.3. +ZRST RESET the Module

This command is used to reset the module. Module will deactivate PDP, release all resources, and then reset.

Command	Response
+ZRST	<CR><LF>OK<CR><LF>

Example

```
AT+ZRST
OK
```

12.4. +ZGPIO GPIO Pins Set command

This command is used to set/Query GPIO status/direction

The syntax of this command +ZGPIO is shown in the table below:

Command	Response
+ZGPIO=?<CR> (Query the parameters' range)	<CR><LF>+ZGPIO: (1-5),(0-1),(0-1),(0-7),(0-2)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZGPIO=<pin> (GPIO STATUS INQUIRY, including I/O and voltage level,driver capability ,pull-up /pull-down.)	<CR><LF>+ZGPIO: <pin>,<mode>,<status>,<n4>,<n5><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZGPIO=<pin>,<mode> (Set GPIO pin as input/output)	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZGPIO=<pin>,<mode>,<status> (This command is used to set GPIO to output high or low level. Input mode can't set high/low level status.)	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<err><CR><LF>
+ZGPIO=<pin>,<mode>,<status>,<n4> (This command is used to set GPIO to output high or low level, and can set the driver capacity. Input mode can't set this status)	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZGPIO=<pin>,<mode>,<status>,<n4>,<n5><CR> (This command is used to set GPIO to output high or low level, and can set the driver capacity,pull-up/down. Input mode can't set this status)	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZGPIO? (Query all the GPIO pins' direction and voltage level)	<CR><LF>+ZGPIO: <all pins mode and status><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

Parameters	Range	remarks
<pin>	1-5	stands for 5 single GPIO Pins
<mode>	0	Input
	1	Output
<status>	0	Low level
	1	High level
<n4>	Driver capacity. The range is 0-7,default 0 0 ---2mA 1 --- 4mA 2 --- 6mA	Only when the pin is set to output, you can set this parameter, or it may return ERROR

	3 --- 8mA 4 --- 10mA 5 --- 12mA 6--- 14mA 7 --- 16mA	
<n5>	Pull-up/down status. When GPIO is input, the default value is 1, when is output, default value is 0. 0 --- NO_PULL 1 --- PULL_DOWN 2 --- PULL_UP	Only when the pin is set to output, you can set this parameter,or it may return ERROR

When there is one parameter of <pin> in set command:

<pin>	Return	remarks
1-5	ZGPIO: <pin>,<mode>,<status> OK	(GPIO STATUS INQUIRY, including I/O and voltage leve.)
other	ERROR	

When there is two parameters of <pin>&<mode> in set command:

<pin>	<mode>	return	remarks
1~5	0 / 1	OK	Set single GPIO as input/output
other	other	ERROR	

When there is three parameters of <pin>&<mode>&<status> in set command:

<pin>	<mode>	<status>	return	remarks
1-5	0	0 / 1	ERROR	Input mode can't set high/low level status.
1-5	1	0 / 1	OK	Set single GPIO high/low status.
other	other	other	ERROR	

Note: you can refer to hardware Development Guide for information fo GPIO pins

Example

```
//return GPIOs parameter range
AT+ZGPIO=?
+ZGPIO: (1-5),(0-1),(0-1),(0-7),(0-2)
OK

//return all GPIOs mode and status
AT+ZGPIO?
+ZGPIO: <1,1,0,0,0>,<2,0,0,0,1>,<3,0,0,0,1>,<4,0,0,0,1>,<5,0,0,0,1>
OK

//return GPIO 1 mode and status
AT+ZGPIO=1
+ZGPIO: 1,0,0,0,1
OK
```

```
//set GPIO2 to be input mode.
AT+ZGPIO=2,0
OK

//set GPIO4 to be output mode and high level.
AT+ZGPIO=4,1,1
OK
```

12.5. +ZADCx Read pin ADCx value

This command is used to read the pin voltage of ADC1 and ADC2 values from modem.

Command	Response
+ZADC<x>?	<CR><LF>+ZADC: <value><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>+CME ERROR: <err><CR><LF>
+ZADC<x>=?	<CR><LF> (50000,4150000)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<x>: the range is 1~2, it indicates get the voltage of ADC1 or ADC2.

<value>: Integer type value of the pin ADC, which is expressed in mV.

Example

```
AT+ZADC1?
+ZADC1:39639

OK
AT+ZADC2?
+ZADC2:39933

OK
AT+ZADC1=?
(50000,4150000)

OK
AT+ZADC2=?
(50000,4150000)

OK
```

12.6. +ZSWITCH Switch the port of module in different operation systems

When the module needs to be switched in different operating systems, we need use the AT command of +ZSWITCH to switch the ports. And this command will take effect after restarting the module.

Command	Response
+ZSWITCH=<os>	<CR><LF>OK<CR><LF>
+ZSWITCH=?	<CR><LF>+ZSWITCH: (x/X,l/L,8)<CR><LF> <CR><LF>OK<CR><LF>
+ZSWITCH?	<CR><LF>+ZSWITCH:<os><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<os>:

L/l Switch the ports to Linux/Android;

X/x Switch the ports to Windows XP/Win7/VISTA/WinCE

8 Switch the ports toWin8

Example

```
AT+ZSWITCH?
+ZSWITCH: x
OK
AT+ZSWITCH=l
OK
AT+ZSWITCH=?
+ZSWITCH: (x/X,l/L,8)

OK
```

12.7. +ZADB Open/close ADB port

This command is supported on**ME3630J2AV1.0B14,ME3630J2ASV1.0B05and above**version.This command is used to open/close ADB port.

You should switch USB port according to the follow condition before enable auto-dial function: AT+ZSWITCH=l, AT+ZADSET=e

Command	Response
+ZADB=<0/1>	<CR><LF>OK<CR><LF>
+ZADB=?	<CR><LF>+ZADB: (0:close adb/1:open adb) <CR><LF> <CR><LF>OK<CR><LF>
+ZADB?	<CR><LF>+ZADB:<0/1><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<0/1>:

0 default value, close ADB; it will take effect after the module is restarted.

1 open ADB, it will take effect exactly after be set, and saved after the module is powered off.

Example

```
AT+ZADB?
+ZADB: 0

OK
AT+ZADB=?
+ZADB: (0:close adb/1:open adb)
```

```
OK
AT+ZADB=1

OK
AT+ZADB?
+ZADB: 1

OK
```

12.8. +ZADSET Port Switch between RNDIS/NDIS in Windows System

This command is used to do port switch between RNDIS/NDIS in Windows System.

Command	Response
+ZADSET=<n>	<CR><LF>OK<CR><LF>
+ZADSET=?	<CR><LF>+ZADSET: (n/N,r/R,e/E)<CR><LF> <CR><LF>OK<CR><LF>
+ZADSET?	+ZADSET: <n> <CR><LF>OK<CR><LF>

Parameter

<n>:

N/n Switch the USB interface to adaptive to WindowsXP/7/VISTA/WinCE system in NDIS mode, this command need to cooperate with command AT+ZSWITCH=X

R/r Switch the USB interface to adaptive to WindowsXP/7/VISTA/WinCE system in RNDISmode, this command need to cooperate with command AT+ZSWITCH=X

E/e Switch the USB interface to adaptive to Linux/Android system in ECM mode, this command need to cooperate with command AT+ZSWITCH=L

Example

```
AT+ZADSET=N
OK
AT+ZADSET?
+ZADSET: n
OK
AT+ZADSET=?
+ZADSET: (n/N,r/R,e/E)

OK
AT+ZADSET=N
OK
AT+ZADSET=n
OK
AT+ZADSET=R
OK
AT+ZADSET=r
```

OK

Note:

at+zadset=<n>need to cooperate with command at+zswitch.

This command is used to do port switch between RNDIS/NDIS in Windows System(at+zswitch=x). the PIDs of module under different operation system are list in the table below:

Operation system& AT command need to send	PID	Interface number	Port
WindowsXP/7/VISTA/WinCE mode (AT+ZSWITCH=x AT+ZADSET=N)	0x1432/0x1403	0	DIAG
		1	AT
		2	MODEM
		3	NDIS
		4	ADB
The default port sequence in general firmware version, support ECM port under Linux/Android OS (AT+ZSWITCH=l AT+ZADSET=E)	0x1476/0x1406	0	DIAG
		1	AT
		2	MODEM
		3	ECM
		4	ECM
WindowsXP/7/VISTA/WinCE mode (AT+ZSWITCH=x AT+ZADSET=R)	0x0601/0x1404	0	RNDIS
		1	RNDIS
		2	DIAG
		3	AT
		4	MODEM
		5	ADB
WIN8 mode (AT+ZSWITCH=8)	0x0602/0x1405	0	DIAG
		1	AT
		2	MODEM
		3	MBIM
		4	MBIM
		5	ADB

12.9. +ZSDT Enable SIM card hot-plug function

This command is used to set/query SIM card **hot-swap**, **hot-swap polarity**(high/low level of SIM_DETECT), **card detect pull**(pull up/down USIM_DETECT pin). And this command will take effect after the module restart.

Command	Response
+ZSDT=<n>[,<polarity>,<pull>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
+ZSDT=?<CR>	<CR><LF>+ZSDT: (0-1)(0-1)(0-3)<CR><LF> <CR><LF>OK<CR><LF>
+ZSDT?<CR>	<CR><LF>+ZSDT: <n>,<polarity>,<pull><CR><LF>

	<CR><LF>OK<CR><LF>

Parameter

<n>:

0 close SIM card hot-plug function**(default value)**

1 open SIM card hot-plug function

<polarity>:

0 low level valid, when SIM card is plugged, USIM_DETECT(PIN41) is low level; when no SIM card, USIM_DETECT(PIN41) is high level**(default)**.

1 high level valid, when SIM card is plugged, USIM_DETECT(PIN41) is high level; when no SIM card, USIM_DETECT(PIN41) is low level.

<pull>: this parameter is used to set USIM_DETECT pull up or down; if there is USIM_DETECT external pull up, <pull> should be 0; if there is no SIM_DETECT external pull up, <pull> should be 3.

0 NO_PULL**(default value)**

1 PULL_DOWN(not recommend)

2 KEEPER(not recommend)

3 PULL_UP

Example

```
AT+ZSDT=0
OK

AT+ZSDT=1,1,3
OK

AT+ZSDT?
+ZSDT: 1,1,3

OK
AT+ZSDT=?
+ZSDT: (0-1)(0-1)(0-3)

OK
```

12.10. +ZCHIPTEMP Get the temperature of pmic, xo, pa

This command is used to get the temperature and its range of PMIC (Power management chip), XO(crystals), PA(overtemp).

Command	Response
+ZCHIPTEMP?	<CR><LF>+ZCHIPTEMP: <pmic_temp>,<xo_temp>,<pa_temp><CR><LF> <CR><LF>OK<CR><LF>
+ZCHIPTEMP=?	<CR><LF><(pmic_temprange)>,<(xo_temprange)>,<(pa_temprange)><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<pmic_temp>: PMIC(Power management chip)temperature, unit 0.1℃

<xo_temp>: XO(crystals)temperature, unit 0.1℃

<pa_temp>: overtemp temperature, unit 0.1℃.

<pmic_temprange>: PMIC**(Power management chip)temperature range**, -300~1100,stands for -30~110℃

<xo_temprange>: XO (crystals)temperature range, -300~1050, stands for -30~105℃

<pa_temprange>: overtemp temperature range is NULL, stands for no range limit.

Example

```
AT+ZCHIPTEMP?          // get the current temperature of pmic, xo, pa.
+ZCHIPTEMP: 287,313,300

OK
AT+ZCHIPTEMP=?         // get the temperature range(software) of pmic, xo, pa.
(-300, 1100), (-300, 1050), (null)

OK
```

12.11. +ZAUTOSLEEP Enable/Disable auto sleep function

This command is used to enable/disable module's auto sleep function. After the command is set to AT+ZAUTOSLEEP=mem to turn on the sleep function, one of the four modes (wakeup_in pin falling edge, pull out USB, USB selective suspend, or at+zpowersave) will trigger module goes to sleep; when setting AT+ZAUTOSLEEP=off, the first three modes will not trigger the module to enter the sleep state. However, the at+zpowersave can force module to enter the sleep mode.

It takes effect immediately after setting, and the set value won't be saved after restart.

Command	Response
+ZAUTOSLEEP=<mode>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZAUTOSLEEP=?	<CR><LF>+ZAUTOSLEEP:(mem,off)<CR><LF> <CR><LF>OK<CR><LF>
+ZAUTOSLEEP?	<CR><LF>+ZAUTOSLEEP:<mode><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR <CR><LF>

Parameter

<mode>: Sleep enable/disable

mem Enable mem sleep mode(default value)

off Disable Sleep Function

Example

```
AT+ZAUTOSLEEP=mem

OK
AT+ZAUTOSLEEP=?
+ZAUTOSLEEP:(mem,off)

OK
AT+ZAUTOSLEEP?
```

```
+ZAUTOSLEEP:mem

OK
```

12.12. +ZPOWERSAVE Module enter sleep mode*

This command is used to let Module enter sleep mode, and then the USB ports are no longer enumerated. It takes effect immediately after setting.

If you need to exit the sleep mode, there are two situations:

1. LCC package module: unplug USB, raise wakeup_in (rising edge) or restart the module;

2. PCIE encapsulation module, pull wakeup_in (rising edge) or restart module;

This command is currently supported by firmware of ME3630E1CV1.0B19, GM500U1AV1.0B04, ME3630A1CV1.0B03 and above.

Command	Response
+ZPOWERSAVE	<CR><LF>OK<CR><LF>

Example

```
AT+ZPOWERSAVE     // Module enter sleep mode
OK
```

12.13. +ZSETDIV Set WCDMA&LTE MAIN&DIVERSITY antenna state*

This command is used to set MAIN&DIVERSITY antenna state of WCDMA&LTE, and it will take effect after restart the module.

This is an extended command, and is supported by firmware of or above GM500U1AV2.0B01.

Command	Response
+ZSETDIV=<mode>,<state><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSETDIV=?<CR>	<CR><LF>+ZSETDIV:(0-1),(0-3) <CR><LF> <CR><LF>OK<CR><LF>
+ZSETDIV?<CR>	<CR><LF>+ZSETDIV:(WCDMA:<state>,LTE:<state>)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

< mode>: integer type, the mode of module,

0 WCDMA

1 LTE

<state>: MAIN&DIVERSITY state

0 restore to the initial value;

1 single MAIN state;

2 Single DIVERSITY status;

3 Both MAIN&DIVERSITY status

-1 The same sense as 3, but this value only one type of the return values of AT+ZSETDIV?, and can't support set this value.

Note:

When the WCDMA initial state is INACTIVE, the state description is as follows-

1. Assume that the initial value of the main diversity of WCDMA is -1, that is, the NV item controlling the main & diversity is not activated, and the default WCDMA's main &diversity is turned on;

2. When restoring the initial value, it is impossible to restore the initial value to inactive, so it is directly restored to 3, that is, both the main& diversity are turned on!

Example

```
Set command:
Set WCDMA single diversity state
AT+ZSETDIV=0,2
OK
Set LTE single main state
AT+ZSETDIV=1,1
OK
restore LTE to the initial value
AT+ZSETDIV=1,0
OK

Read command
AT+ZSETDIV?
+ZSETDIV:(WCDMA:2,LTE:-1)

OK

Test command
AT+ZSETDIV=?
+ZSETDIV:(0-1),(0-3)

OK
```

13. TCP/IP Relative Commands

13.1. +ZIPCONTEXT Switch PDP context

This command is used for query/set the PDP context, and valid once setting, and it will be invalid after restart.

And is only supported by ME3630-E and ME3630-A currently.

Command	Response
+ZIPCONTEXT=[<cid>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPCONTEXT?	<CR><LF>+ ZIPCONTEXT: <cid><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+ERROR<CR><LF>
+ZIPCONTEXT=?	<CR><LF>+ ZIPCONTEXT: (list of supported <cid>s)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<cid>: int type, used for PDP context ID, the default value is 1, range can be 1-5.

Example

```
AT+ZIPCONTEXT?
+ZIPCONTEXT: 1
OK

AT+ZIPCONTEXT=2
OK

AT+CGDCONT?
+CGDCONT: 1,"IP","3gnet","0.0.0.0",0,0,0,0
+CGDCONT: 2,"IP","3gwap","0.0.0.0",0,0,0,0
+CGDCONT: 3,"IP","3GWAP","0.0.0.0",0,0,0,0
+CGDCONT: 4,"IP","3gnet","0.0.0.0",0,0,0,0
+CGDCONT: 5,"IP","3gnet","0.0.0.0",0,0,0,0

OK
AT+ZIPCONTEXT=?
+ZIPCONTEXT: (1-5)
OK
```

13.2. +ZIPOPEN Establish TCP/UDP Connection

Extensible AT command, this command is used to Establish TCP/UDP connection with remote server. It will report +ZIPSTAT automatically to indicate the socket state. Before AT+ZIPOPEN, you need first start PS call by command AT+ZIPCALL.

Note:

1. When establishing TCP connection, there are two ways to handle this: asynchronous and synchronous, the default is asynchronous.

When in asynchronous mode, if network abnormality occurs (such as: poor signal, no route, etc.) or the server fails, After the command is sent, it returns "OK" first, and won't block the AT port, user can try to establish other connections.

When in synchronous mode, the AT port may be blocked; at this time, you need to wait for the response of this command before proceeding to the next step. If the command response is not received in more than time set by <timeout>, it can be determined that the module has an abnormality and needs to import fault tolerance (for example, restart the module).

2. When establishing UDP connection, AT port won't be blocked as there is no handshake process. Usually, you need to wait for the response of this command before sending the next command.

Command	Response
+ZIPOPEN=<Socket id>,<Protocol Type>, <Remote Address>,<Remote port>[,<Local port>[,<timeout>]]	<CR><LF>OK<CR><LF> <CR><LF>+ZIPSTAT: <Socket id>,<Status><CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPOPEN?	When there is valid socket, it will return: <CR><LF>+ZIPOPEN: <Socket id>,<Protocol Type>,<Remote Address>,<Remote port><CR><LF> [...] <CR><LF>OK<CR><LF> or When there is no valid socket, it will return: <CR><LF>+ZIPOPEN: 0<CR><LF> <CR><LF>OK<CR><LF>
+ZIPOPEN=?	<CR><LF>+ZIPOPEN: (list of supported <Socket id>s),(list of supported <Protocol Type>s),<Remote Address>[,(list of supported <Remote port>s)][,(list of supported <Local port>s)][,<timeout>]]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Type>: The protocol type of socket connection

0 TCP

1 UDP

<Remote IP >: IP address or Domainname of Remote server.

<Remote port>:Server port of Remote server, range: 1-65535

<Local port>:Local port,range: 0-65535, the default value is 0, which stands for using the port number assigned by the system

<timeout>: TCP connection timeout, range is 0-60, in seconds; the default value is 0; only valid for TCP connection;

0 indicates asynchronous mode is enabled, and background connection timeout time is 30 seconds.

1-60 Indicates synchronization mode is enabled and its value is the connection timeout.

<Status>: State of Socket Connection

0 Socket connection is closed.

1 Socket connection is open, both send data and receive data normally.

2 Socket connection is open, receive data normal, but send buffer is full.

3 Socket connection is opening.

4 Socket connection is closing.

Example

```
AT+ZIPOPEN=1,0,125.55.143.92,6000
OK
+ZIPSTAT: 1,1
AT+ZIPOPEN=?
+ZIPOPEN: (1-5),(0-1),,(1-65535)[,(0-65535)[,(0-60)]]
OK
```

13.3. +ZIPCLOSE Close TCP/UDP Connection

Extensible AT command, this command is used to Close TCP/UDP connection. it will report +ZIPSTAT automatically to indicate the socket state.

Command	Response
+ZIPCLOSE =<Socket id>	<CR><LF>OK<CR><LF> +ZIPSTAT: <Socket id>,<Status><CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPCLOSE?	<CR><LF>+ZIPCLOSE: [(Socket1, <Status>)[,(Socket2, <Status>)[,(Socket3, <Status>)[,(Socket4, <Status>)[,(Socket5, <Status>)]]]]]<CR><LF> <CR><LF>OK<CR><LF> OR <CR><LF>+ZIPCLOSE: 0<CR><LF> <CR><LF>OK<CR><LF>
+ZIPCLOSE=?	<CR><LF>+ZIPCLOSE: (list of supported <Socket id>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Status>: State of Socket Connection

0 Socket connection closed.

1 Socket connection open, both send data and receive data normally.

2 Socket connection open, receive data normal, but send buffer is full.

3 Socket connection opening.

4 Socket connection closing.

Example

```
AT+ZIPCLOSE?
+ZIPCLOSE: (Socket1,0),(Socket2,0),(Socket3,0),(Socket4,0),(Socket5,0)

OK
AT+ZIPCLOSE=1
OK
+ZIPSTAT: 1,0
```

13.4. +ZIPSEND TCP/UDP Send Data in ASCII format

Extensible AT command, this command is used to send datain ASCII format. The data can be sent only when the socket state is 1(Socket connection open, both send data and receive data normally), if socket state become to 2(Socket connection open, receive data normal, but send buffer is full),it will report +ZIPSTAT: <Socket id>,2 automatically . At this time, user can not send data until the socket state become to 1.

NOTE: We recommend to use command +ZIPSENDRAW to send raw data.

Command	Response
+ZIPSEND=<Socket id>, <Data>	<CR><LF>OK<CR><LF> <CR><LF>+ZIPSEND: <Socket id>,<Size><CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPSEND?	<CR><LF>+ZIPSEND: <Socket id>,<Size>[<CR><LF> +ZIPSEND: <Socket id>,<Size>[...]]<CR><LF> (For all opened Socket) <CR><LF>OK<CR><LF>

Parameter

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Data>: The data length can be 1024Bytes at more. And the data should be hexadecimal encoded.

Eg: “48656C6C6F21” means “Hello!”.

<Size>: the length of data send the last time. if no data sent, the <Size> is 0.

Example

```
AT+ZIPSEND=1,31323334
OK
+ZIPSEND: 1,4
+ZIPRECV: 1,125.15.143.92,3000,4,31323334
```

13.5. +ZIPRECV TCP/UDP Data Receive

Extensible AT command, this command is used to receive data. The data will be reported to TE automatically when module received data. The data length should less than 1024Bytes.

Command	Response
	<CR><LF>+ZIPRECV: <Socket id>,<Remote IP>,<Remote port>,<Data len>,<Data><CR><LF>

Parameter

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Remote port>:Server port of Remote server, range: 1-65535

<Local port>:Local port,range: 1-65535

<Data len>: The length of received data, should less than 1024Bytes.

<Data>: The received raw data(“Hello!” for example) in default. If you want to receive data in ASCII format(“48656C6C6F21” indicate to “Hello!”), please send command +ZIPSETRPT to set the format of received data.

Example

```
+ZIPRECV: 1,125.15.143.92,3000,4,ABCD
AT+ZIPSERRPT=0
OK
+ZIPRECV: 1,125.15.143.92,3000,4,61626364
```

13.6. +ZIPSTAT Query Socket State

Extensible AT command, this command is used to Query Socket State. When the socket state changed, the new state will be reported automatically.

Command	Response
+ZIPSTAT=<Socket id>	<CR><LF>+ZIPSTAT: <Socket id>,<Status><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPSTAT=?	<CR><LF>+ZIPSTAT: (list of supported <Socket id>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Status>: State of Socket Connection

0 Socket connection closed.

1 Socket connection open, both send data and receive data normally.

2 Socket connection open, receive data normal, but send buffer is full.

3 Socket connection opening.

4 Socket connection closing.

Example

```
AT+ZIPSTAT=1
+ZIPSTAT: 1,1
OK
```

13.7. +ZIPSLCFG Set Parameters of TCP/UDP Server

Extensible AT command, this command is used to Set parameters of TCP/UDP server.

Command	Response
+ZIPSLCFG=<Server Type>,<Source port>,<Time out>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPSLCFG?	<CR><LF>+ZIPSLCFG:<Server Type>,<Source port>,<Time out><CR><LF> [<CR><LF>+ZIPSLCFG:<Server Type>,<Source port>,<Time out><CR><LF>] <CR><LF>OK<CR><LF>
+ZIPSLCFG=?	<CR><LF>+ZIPSLCFG: (list of supported <Server Type>s), (list of supported <Source port>s), (list of supported <Time out>s)<CR><LF>

	<CR><LF>OK<CR><LF>

Parameter

<Type>: Protocol type

0 TCP

1 UDP

<Source port>: The Listening port, range: 1-65535

<Time out>: Max idle time of UDP connection. When the max idle time large than the value of time out, this udp connection will be released automatic, the parameter just used for udp server.

0 the idle time is infinite.

1~3600 idle time, means several seconds, the default value is 600 seconds.

Example

```
AT+ZIPSLCFG=0,5000,0
OK
AT+ZIPSLCFG=1,5001,60
OK
AT+ZIPSLCFG?
+ZIPSLCFG: 0,5000,0
+ZIPSLCFG: 1,5001,60
OK
```

13.8. +ZIPLISTEN Open/Close TCP/UDP Server

Extensible AT command, this command is used to Open/Close TCP/UDP server. It can support a udp server and a tcp server simultaneously, the information of remote client connected to the server will be reported automatically.

Command	Response
+ZIPLISTEN=<Mode>,<Type>	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPLISTEN?	<CR><LF>+ZIPLISTEN:<Status>,<Type> [<CR><LF>+ZIPLISTEN:<Status>,<Type>] [<CR><LF>+ZIPLISTEN: <Status>,<Type>,<Socket id><Remote Address>,<Remote port>] [<CR><LF>+ZIPLISTEN: <Status>,<Type>,<Socket id><Remote Address>,<Remote port>[...]]<CR><LF> <CR><LF>OK<CR><LF>
+ZIPLISTEN=?	<CR><LF>+ZIPLISTEN: (range of supported <Mode>s),<Remote Address>, (range of supported <Type>s)[,(range of supported <Source port>s)]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Mode>:TCP/UDP server listening mode

0 close TCP/UDP server

1 open TCP/UDP server

<Type>: protocol type

0 TCP

1 UDP

<Status>:State of TCP/UDP server

0 server listening is close

1 server listening is open

<Socket id>: Socket Connection indication

0 Invalid Socket id

1-5 Valid Socket id

<Remote IP>: IP address of remote client

<Remote port>: port of remote client, range: 1-65535

Example

```
AT+ZIPLISTEN=1, 0 //Open tcp server
OK

+ZIPLISTEN: 0, 1, 119.75.1.1, 5005
//TCP server is in the listening state, and a remote client connected to the server.
AT+ZIPLISTEN=1, 1 //Open udp server
OK

+ZIPLISTEN: 1, 2, 119.75.1.1, 5005
//UDP server is in the listening state, and a remote client connected to the server.
```

13.9. +ZIPFRWL Set TCP/UDP Internal Firewall

Extensible AT command, this command is used to Set TCP/UDP internal Firewall.

The Internal firewall is used to allow the module be connected with clients whose ip address are in the visit list. The firewall works when the TCP/UDP server is in the listening state.

The visit list includes an IP address, an IP subnet mask and the firewall support at most 10 visit list.

The visit lists can be edited only when there is socket opened and the firewall is not in close state. The firewall has no use to the sockets established before firewall starts.When the module restart, the firewall will in the close state, and the visit lists will be initialized as empty.

Command	Response
+ZIPFRWL=<Cmd type>[,<IP address>,<Net mask>]	<CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPFRWL?	<CR><LF>+ZIPFRWL: <State> <CR><LF>+ZIPFRWL: <IP address>,<Net mask> [<CR><LF>+ZIPFRWL: <IP address>,<Net mask> [...]]<CR><LF> <CR><LF>OK<CR><LF>
+ZIPFRWL=?	<CR><LF>+ZIPFRWL: (list of supported <Cmd type>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<Cmd type>:

0 Close firewall (Default Value)

1 Open firewall

2 add new ip address to the visit lists

3 delete ip address from the visit lists

4 initialized the visit lists as empty

<state>: firewall state

0 firewall is in the close state

1 firewall is in the open state

<IP address>: IP address to add or delete. It can be any valid IP address, format is: XXX.XXX.XXX.XXX

<Net mask>: submet mask of the IP address to add or delete. It can be any valid IP address mask, format is: XXX.XXX.XXX.XXX

Example

```
AT+ZIPFRWL=1 //open firewall
OK
AT+ZIPFRWL=2,"192.158.1.1","255.255.0.0"          //Add ipaddr to list
OK
AT+ZIPFRWL=?
+ZIPFRWL: (0-4)

OK
AT+ZIPFRWL?                  //Query firewall list
+ZIPFRWL: 1
+ZIPFRWL: "192.158.1.1","255.255.0.0"

OK
```

13.10. +ZIPSETRPT set the format of received data

This command is used to set the format of received data.

Command	Response
+ZIPSETRPT=<view_mode>	<CR><LF>OK <CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
+ZIPSETRPT?	<CR><LF>+ZIPSETRPT: <view_mode><CR><LF> <CR><LF>OK <CR><LF>
+ZIPSETRPT=?	<CR><LF>+ ZIPSETRPT: (0-1)<CR><LF> <CR><LF>OK <CR><LF

Parameter

<view_mode>:

0 HEX format

1 raw data (default value)

Example

```
AT+ZIPSETRPT?
+ZIPSETRPT: 1
```

```
OK

AT+ZIPSETRPT=?
+ZIPSETRPT: (0,1)

OK
+ZIPRECV: 1,125.15.143.92,3000,4,ABCD
AT+ZIPSETRPT=0
OK
+ZIPRECV: 1,125.15.143.92,3000,4,61626364
```

13.11. +ZIPSENDRAW send raw data

This command is used to send the raw data provided by MCU/AP Side. After this command, the module will receive raw data from serial device and then quit until the received data length exceed the set length or timeout.

Command	Response
+ZIPSENDRAW=<socket_ID>,<len>[,<timeout>]	<CR><LF>><space><data><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPSENDRAW=?	<CR><LF>+ZIPSENDRAW: (1-5),(1-1024),(0-60)<CR><LF>

Parameter

<socket_ID >: range is 1-5, valid socket ID.

<len>: range is 1-1024, the length of data need to be sent.

<timeout>: range is 0-60, Unit is s(second),the timeout, 0 is stand not enable Timeout mechanism

Example

```
AT+ZIPSENDRAW=1,10
> 0123456789          //The data need to be sent

OK

+ZIPSENDRAW: 1, 10
```

13.12. +ZIPCREATE Data transparent transfer

This command is used to send the raw data provided by device, and transparent transfer the raw data. When send this command, the module will get the data from the serial port, and end until receive +++.

This command is support on ME3630-A series modules and ME3630E1CV1.0Bxx ,ME3630J2AV1.0B11 version and above currently.

Command	Response
+ZIPCREATE=<socket_ID>	<CR><LF>><space><data><CR><LF>(Send +++ to exit transparent transfer) <CR><LF>OK<CR><LF> Or

	<CR><LF>ERROR<CR><LF>
+ZIPCREATE=?	<CR><LF>+ZIPCREATE: (1-5)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<socket_ID >:range is 1-5, valid socket ID, transparent transfer, send +++ to exit transparent transfer.

Note:

in order to prevent the +++ instruction be mistaken for data, this +++ need keep the interval at least 900 ms to the raw data. And the interval between three + need to be between 2ms≤T≤900ms, otherwise, + will be treated as raw data.

Example

```
AT+ZIPCFG=3gnet
OK
AT+ZIPCALL=1
OK

+ZIPCALL: 1,10.188.234.150
AT+ZIPOPEN=1,0,219.144.130.27,21,8885
OK

+ZIPSTAT: 1,1
+ZIPRECV: 1,219.144.130.27,21,148
AT+ZIPCREATE=1                    //start Data transparent transfer, you don't need to set the timeout or length of data, you can send the data and end this mode by +++
> 123456789123332555563222456525214l+++
OK
```

13.13. +ZDNSGETIP domain name resolution

This command is used for domain name resolution.

This command can be used only when registered to the network.

Note: This command doesn't support IPv6. And this command is only supported by ME3630-E &ME3630-U currently.

Command	Response
+ZDNSGETIP=<domain_name>	<CR><LF>+ZDNSGETIP: <IP><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<domain_name>: The domain name need resolution (no need Double quotation marks)

<IP>: The IP address after resolution.

Example

```
AT+ZDNSGETIP=www.baidu.com
+ZDNSGETIP: 180.97.33.107
```

```
OK

AT+ZDNSGETIP="wwwbaiducom”
ERROR
```

13.14. +ZIPALIVE KeepAlive function setting instruction

This command is used to set the keep alive function to keep the TCP long connection.

Note: The command is only supported by firmware of or above ME3630E1CV1.0B19/ GM500U1AV1.0B05/ ME3630A1CV1.0B03 currently.

Command	Response
+ZIPALIVE=<socket_id>,<keepAlive>[,<keepIdle>,<keepInterval>,<keepCount>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPALIVE=?	<CR><LF>+ZIPALIVE: (1-5),(0,1),(1-32767),(1-32767),(1-127)<CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
+ZIPALIVE?	<CR><LF>+ZIPALIVE:<socket_id>,<keepAlive>,<keepIdle>,<keepInterval>,<keepCount><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<socket_id>:Socket

0 Invalid socket identification number

1-5 Valid socket identification number

<keepAlive>:

0 Turn off the keepAlive function (the default is 0. When the keepAlive function is disabled, the next three parameters can be defaulted).

1 Turn on the keepAlive function (all parameters must be set by default when the keepAlive function is turned on).

<keepIdle>:Set the idle waiting time in seconds (should be less than the base station disconnection time, 300S is recommended, the value range is [1, 32767]).

<keepInterval>:Set the heartbeat packet sending interval, in seconds (the interval between each packet of heartbeat detection packets, recommended 75S, value range [1, 32767]).

<keepCount>:Set the number of heartbeat packet transmissions. When the peer does not respond, the maximum number of heartbeat packets is sent. If the peer does not answer the interval, the link is disconnected. It is recommended to use 9 packets, the range is [1,127].

Example

```
at+zipalive=1,1,300,75,9
OK
at+zipalive=?
+ZIPALIVE: <socket_id>, <keepAlive>, <keepIdle>, <keepInterval>, <keepCount>

OK
at+zipalive?                    //Query the keepAlive configuration of the currently existing TCP link
```

```
+ZIPALIVE: 1,1,300,75,9

OK
```

13.15. +ZIPUNACK Get length of data not been confirmed by the peer

This command is used to obtain the data length that the TCP SOCKET has sent but has not been confirmed by the peer. It can be used to check whether the data sent by the TCP SOCKET has been received by the peer. When all the sent data is received by the peer, the command is queried. The length of the data that has not been confirmed by the peer is 0.

Remark: This setting command is valid only when the TCP connection is open. It can be used without sending TCP/UDP data or sending data multiple times. However, it is recommended to follow the send command matching query if necessary.

Note: The command is only supported by firmware of or above ME3630E1CV1.0B19/GM500U1AV1.0B05/ME3630A1CV1.0B03 currently.

Command	Response
+ZIPUNACK=<Socket id>	<CR><LF>+ZIPUNACK: <Socket id>,<Pending length>,<Remain length><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPUNACK=?	<CR><LF>+ZIPUNACK:(1-5) <CR><LF>OK<CR><LF>

Parameter

<Socket id>: Socket Id

0 Invalid socket identification number

1-5 Valid socket identification number

<Pending length>: The length of the data that has not been confirmed by the peer.

<Remain length>: The remaining length of the send buffer.

Example

```
AT+ZIPUNACK=1
+ZIPUNACK: 1,0,44800
OK
```

13.1. +ZIPSERPORT Set TCP server's port

This command is used to set the TCP server's port, and it will be saved after restart the module.

Command	Response
+ZIPSERPORT=<port>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZIPSERPORT?	<CR><LF>+ZIPSERPORT: <port><CR><LF> <CR><LF>OK<CR><LF>
+ZIPSERPORT=?	<CR><LF>+ZIPSERPORT: (1-65535)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

< port>: Port number, the range should be:1-65535

Example

```
AT+ZIPSERPORT=1234
OK
AT+ZIPSERPORT?
+ZIPSERPORT: 1234

OK
AT+ZIPSERPORT=?
+ZIPSERPORT: (1-65535)

OK
```

13.2. TCP Example

```
+ZREADY                    // Module power-on active reporting

AT+CPIN?                   //Query SIM card status
+CPIN: READY

OK
AT+CSQ                     //Query signal strength
+CSQ: 16,99

OK
AT+CREG?                   // Query network status
+CREG: 0,1

OK

AT+ZDATACFG=1,"IPV4V6","3gnet"       //Set APN. Use China Unicom's SIM card for test, APN is 3gnet,for detail please consult operator of your SIM card
OK
AT+ZDATAACT=1              //Do data call for PDP context of <cid>=1
OK
AT+ZDATAACT?               //Query data connection status, success, Network allocation IP to module
+ZDATAACT: 1,"IPV4",10.109.94.160,221.11.1.67,221.11.1.68
+ZDATAACT: 1,"IPV6",2408:84fb:1220:19df:2911:97f1:d9e2:380a,2408:8888::8,2408:8899::8

OK
AT+ZIPCONTEXT=1            //Set PDP context for TCP connection
OK
at+zipopen=2,0,219.144.130.27,8885,0,30          //establish TCP connection whose socket_id=2
OK
```

```
+ZIPSTAT: 2,1
at+zipopen=5,1,219.144.130.27,7000            // establish TCP connection whose socket_id=5
OK

+ZIPSTAT: 5,1
at+zipsend=2,3131313131313131313131313131313132              //Send TCP data of HEX format through socket_id=2
OK

+ZIPSEND: 2,16

+ZIPRECV: 2,219.144.130.27,8885,16,1111111111111112       //Received transparent data from TCP server, HEX data format display
at+zipsend=5,31313131313434343434353535535            // Send TCP data of HEX format through socket_id=5
OK

+ZIPSEND: 5,14

+ZIPRECV: 5,219.144.130.27,7000,14,11111444445555        //Received transparent data from TCP server, HEX data format display

AT+ZIPSETRPT=1       // set the raw format of received data
OK
AT+ZIPSENDRAW=2,123         //send TCP raw data
OK

+ZIPSEND: 2,3

+ZIPRECV: 2,219.144.130.27,8885,3,123       / Received transparent data from TCP server, raw data format display

AT+ZIPSTAT=2
+ZIPSTAT: 2,1
OK
AT+ZIPSTAT=5
+ZIPSTAT: 5,1
OK
AT+ZIPCLOSE=2       //Close TCP connection whose socket_id=2
OK

+ZIPSTAT: 2,0                  //TCP disconnection success
AT+ZIPCLOSE=5       // Close TCP connection whose socket_id=5
OK

+ZIPSTAT: 5,0                 // TCP disconnection success
```

```
AT+ZDATADEACT=1          //PDP connection disconnection. Only when there is no service use this cid, the PDP connection can be disconnected. Or other service will be unavailable.
OK
```

14. FTP Relative Commands

Note: The commands in this chapter are only supported by firmware of or above ME3630E1CV1.0B19/GM500U1AV1.0B05/ ME3630A1CV1.0B03 currently.

14.1. $ZFTPCFG FTP Parameters Configuration

You need to set the destination IP address, port, username, password of FTP server before login by this command.

Command	Response
$ZFTPCFG=<destination_ip[:port]>,<username>,<password>[,<mode>[,<cid>]]	<CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<destination_ip[:port]>: destination ip address:portof FTP server, if the port is 21, you can omit this parameter, or you need to add this value manully.

<username>: Username

<password>: password

<mode>:The parameter is used to distinguish FTP from FTPs. Where the value of 1 means FTPs, the value of 0 means FTP. If this parameter is not defined, the default is set to FTP mode.

<cid>: int type, used for PDP context ID, the default value is 1,range can be 1-5.

Example

```
AT$ZFTPCFG=219.144.130.27,test,test,0,2      //The port of server is 21
OK
AT$ZFTPCFG=219.144.130.27:8885,test,test      // The port of server is 8885
OK
AT$ZFTPCFG=219.144.130.26:9991,Test1,123456,1      // The port of server is 9991,the module will config FTPs mode.
OK
```

14.2. $ZFTPTO FTP Timeout configure

If you need to set the connection timeout, upload/download timeout before FTP services, you can use this command to configure; If not set, it will be executed according to the default timeout time.

The premise of this setting command is that the FTP parameters (the server's IP address, port, user name, and password) have been configured, otherwise ERROR will be returned. This command just keeps the FTP configuration parameters in the module.

Command	Response
$ZFTPTO=<con_timeout>[,<rsp_timeout>]	<CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>
$ZFTPTO?	When a valid socket connection exists, it returns:

	<CR><LF>$ZFTPTO:<con_timeout>,<rsp_timeout><CR><LF> <CR><LF>OK<CR><LF>
$ZFTPTO =?	<CR><LF>$ZFTPTO:(list of supported<con_timeout>s)[,(list of supported <rsp_timeout>s)]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<con_timeout>: FTP connection timeout, that is the timeout period of FTP during the connection phase. If no connection succeeds during this period, ERROR is returned. The value ranges is from 1 to 60 seconds. The default value is 30 seconds.

Note: This value can't be set too short, or it may cause the data request to be terminated.

<rsp_timeout>: FTP upload/downloadtimeout, which means that after the FTP connection is established, if the data doesn't finish transmitted within this period, the connection will be disconnected. The value ranges from 0 to 360 seconds. The default value is 120, which means that the data connection will be disconnected after 120 seconds.

Example

```
AT$ZFTPTO=20          //Set FTP connection timeout as 20s
OK

AT$ZFTPTO=20,30      // Set FTP connection timeout as 20s,FTP upload/download timeout as 30s
OK
AT$ZFTPTO?
$ZFTPTO:20,30

OK
AT$ZFTPTO=?
$ZFTPTO:(1-60)[,(0-360)]

OK
```

14.3. $ZFTPSIZE Get the Size of FTP File

This command is used to get the size of FTP file

Command	Response
$ZFTPSIZE=<File_Name>	<CR><LF>$ZFTPSIZE: <length><CR><LF> <CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<File_Name >: name of the file which you want to get the size, and case-insensitive

Note:

1. you need to make sure there is the file in FTP server, or it will return ERROR.
2. If the file is not in root path, you need to add the storage path.

<length>: The size of the file in unit byte

Example

```
AT$ZFTPSIZE=ftp.txt
$ZFTPSIZE: 20
```

```
OK
AT$ZFTPSIZE=ftp1.txt
$ZFTPSIZE: 69520
OK
AT$ZFTPSIZE=APP/ftp1.txt       //the path to save the file is: /APP/ftp1.txt
$ZFTPSIZE: 20
OK
```

14.4. $ZFTPGET File Download

This command is used to download the FTP file, you can download the whole file or part of the file.

Command	Response
AT$ZFTPGET=<File_Name>[,<data_offset>, <data_length>]	<CR><LF><content><CR><LF> <CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<File_Name >: The file name you need to download, and case-insensitive

<data_offset>: The offset of the data you want to download

<data_length>: The length of data you want to download,the range can be 1~ 4096 bytes

If no setting of <data_offset> and <data_length>, the module will download the whole file in default.

Example

```
Download the whole file:
AT$ZFTPGET=ftp_lili02.txt
AT$ZFTPGET=APP/ftp1.txt      //download ftp1.txt in path of /APP/
12345678901234567890
OK
AT$ZFTPGET=test.txt         // download test.txt in root path
This is a test, This is a test
OK

Download part of file:
AT$ZFTPGET=test.txt,0,15
This is a test,
OK
AT$ZFTPGET=test.txt,5,20
is a test, This is a
OK
```

14.5. $ZFTPPUT File Upload

This command is used to upload the file to FTP server.

Command	Response
AT$ZFTPPUT=<File_Name>,<data_length>	<CR><LF>CONNECT<CR><LF>

	<CR><LF><input_content> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<File_Name>: The file name you need to upload, and case-insensitive. If the name you set is the same as the file in server, it will replace the file in FTP server.

<data_length>: The length of data you want to upload

<input_content>: the file content you want to input, when the length exceed the setting value, the exceed content is invalid.

Example

```
AT$ZFTPPUT= test.txt,30
CONNECT
This is a test, This is a test
OK
```

14.6. $ZFTPSSIZE Get the Size of FTPs File

This command is supported on**ME3630E1CV1.0B18/ME3630E2CV1.0B05 and above version and ME3630-A series** modules.

This command is used to get the size of FTPs file

Command	Response
$ZFTPSSIZE=<File_Name>	<CR><LF>$ZFTPSSIZE: <length><CR><LF> <CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<File_Name >: name of the file which you want to get the size, and case-insensitive

Note:

1.you need to make sure there is the file in FTPs server, or it will return ERROR.

2.If the file is not in root path, you need to add the storage path.

<length>: The size of the file in unit byte

Example

```
AT$ZFTPSSIZE=ftps.txt
$ZFTPSSIZE: 20
OK
AT$ZFTPSSIZE=ftps1.txt
$ZFTPSSIZE: 69520
OK
AT$ZFTPSSIZE=APP/ftps1.txt      //the path to save the file is: /APP/ftps1.txt
$ZFTPSSIZE: 20
OK
```

14.7. $ZFTPSGET Send GET request to FTPs server and Download File

This command is supported on **ME3630E1CV1.0B18/ME3630E2CV1.0B05 and above version and ME3630-A series** modules.

This command is used to download the FTPs file, you can download the whole file or part of the file.

Command	Response
AT$ZFTPSGET=<File_Name>[,<data_offset>, <data_length>]	<CR><LF><content><CR><LF> <CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<File_Name >: The file name you need to download, and case-insensitive

<data_offset>: The offset of the data you want to download

<data_length>: The length of data you want to download,the range can be 1~ 4096 bytes

If no setting of <data_offset> and <data_length>, the module will download the whole file in default.

Example

```
Download the whole file:
AT$ZFTPSGET=ftp_lili02.txt
AT$ZFTPSGET=APP/ftp1.txt      //download ftps1.txt in path of /APP/
12345678901234567890
OK
AT$ZFTPSGET=test.txt          // download test.txt in root path
This is a test, This is a test
OK

Download part of file:
AT$ZFTPSGET=test.txt,0,15
This is a test,
OK
AT$ZFTPSGET=test.txt,5,20
is a test, This is a
OK
```

14.8. $ZFTPSPUT Send PUT request to FTPs server and Upload File

This command is supported on **ME3630E1CV1.0B18/ME3630E2CV1.0B05 and above version and ME3630-A series** modules.

This command is used to upload the file to FTPs server.

When send this command, ME3630 will log in server first, and then the file will be directly manipulated. After the execution, the FTP login will be quit. That is, the FTP connection will be disconnected after each operation, and the connection will be re-initiated after receiving the next instruction. The instruction timeout is 60S

Command	Response
AT$ZFTPSPUT=<File_Name>,<data_length>	<CR><LF>CONNECT<CR><LF> <CR><LF><input_content> <CR><LF>OK <CR><LF> or

	<CR><LF>ERROR<CR><LF>

Parameter

<File_Name>: The file name you need to upload, and case-insensitive. If the name you set is the same as the file in server, it will replace the file in FTPs server.

<data_length>: The length of data you want to upload

<input_content>: the file content you want to input, when the length exceed the setting value, the exceed content is invalid.

Example

```
AT$ZFTPSPUT= test.txt,30
CONNECT
This is a test, This is a test
OK
```

14.9. $ZFTPCLOSE Close FTP Service

FTP support download file one by one package. If the file is not downloaded completely by subpackage mode, you need send +ZFTPCLOSE to close FTP server.

Command	Response
AT$ZFTPCLOSE	<CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>

Example

```
AT$ZFTPSIZE=PUT_02.TXT
$ZFTPSIZE: 69520
OK
AT$ZFTPGET=PUT_02.TXT,0,100
01234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
OK
AT$ZFTPCLOSE                    //send ZFTPCLOSE to prevent download file continously.
OK
```

14.10. FTP Example

```
AT+CSQ                          //Query signal strength
+CSQ: 16,99

OK
AT+ZPAS?                        //Query network status
+ZPAS: "LTE","CS_PS"

OK
AT+ZDATACFG=1,"IP","CTNET"      //Set Operator APN

OK
AT+ZDATAACT=1                   //Activate PDP connection
```

```
OK
AT$ZFTPCFG=219.144.130.27,test,test,0,1          //FTP Parameters setting
OK
AT$ZFTPPUT=ftp.txt,20                           //FTP file uplaod

CONNECT
                          //The content you want to upload, and when using COM tool, it won't echo in window
OK
AT$ZFTPSIZE=ftp.txt                      //Get the FTP file size of
$ZFTPSIZE: 20
OK
AT$ZFTPGET=ftp.txt                   // File download
01234567890123456789
OK
AT$ZFTPCLOSE
OK
```

14.11. FTPs Example

```
AT+CSQ                          //Query signal strength
+CSQ: 16,99

OK
AT+ZPAS?                        //Query network status
+ZPAS: "LTE","CS_PS"

OK
AT+ZDATACFG=1,"IP","CTNET"          //Set Operator APN
OK
AT+ZDATAACT=1               //Activate PDP connection
OK
AT$ZFTPCFG=219.144.130.26:9992,Test1,123456,1,1          //FTPs Parameters setting
OK
AT$ZFTPSPUT=ftps.txt,20                         //FTPs file uplaod

CONNECT
                          //The content you want to upload, and when using COM tool, it won't echo in window
OK
AT$ZFTPSSIZE=ftps.txt                    //Get the FTPs file size of
$ZFTPSSIZE: 20
OK
AT$ZFTPSGET=ftps.txt                 // File download
01234567890123456789
OK
```

```
AT$ZFTPCLOSE          //Close FTP
OK
```

15. HTTP/HTTPs Relative Commands

15.1. +ZHTTPCFG Configuring HTTP properties

This command is used to configure HTTP attributes, and will take effect once setting, the parameter won't be saved after restart the module.

Command	Response
+ZHTTPCFG=responseheader,<switch>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPCFG=customheader,<item>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPCFG?	<CR><LF>+ZHTTPCFG: responseheader,<switch><CR><LF> <CR><LF>+ZHTTPCFG: customheader,<item><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPCFG=?	<CR><LF>+ZHTTPCFG: responseheader,(0-1)<CR><LF> <CR><LF>+ZHTTPCFG: customheader,<item><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<switch> : Whether to report the header of the response message, the value range [0, 1].

0 means no report

1 means report. (default value)

<item>: A single custom header for requesting messages, or a special value "clean" means that clears all custom headers.

This parameter needs to follow the HTTP protocol format. The parameter type is Accept xxx. Accept means that the sender (client) wants to receive the data type sent by the server. For example, Accept: text/xml means that the data type that the client wants to receive text in xml format.

Remarks

1.Use AT+ZHTTPCFG=customheader, <item> command can only configure one header in a single time, and support up to 10 headers.

2.Use AT+ZHTTPCFG=customheader, <item> to overwrite the previously configured value when configuring the existing header attribute.

3.When item is a special value "clean", it means to clear all configured custom headers.

Example

```
AT+ZHTTPCFG=responseheader,0          // 0:Header not reporting response information
OK

AT+ZHTTPCFG=?
+ZHTTPCFG: responseheader,(0-1)
+ZHTTPCFG: customheader,<item>
```

```
OK

AT+ZHTTPCFG?
+ZHTTPCFG: responseheader,0
+ZHTTPCFG: customheader,0

OK

at+zhttpcfg=customheader,Accept: json/html
OK
at+zhttpcfg=customheader,Accept-Encoding: gzip          //The client wants to receive data compressed with gzipfrom the server
OK
```

15.2. +ZHTTPURL Set URL of HTTP server

When setting the URL of HTTP server, it will start authentication automatically, and return OK at first, then return the result of authentication.

Command	Response
+ZHTTPURL=<url_str>[,<timeout>[,cid]]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPURL?	<CR><LF>+ZHTTPURL:xxxxxxxxx<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<url_str>: Hypertext transfer protocol URL, support 511 bytes in maximum.

<timeout>timeout value, range is:0,10-120000, unit is ms,

0 default value, disable timeout function

If it is less than 10ms, the default is 10ms.If it is greater than 120000, the default is 120000ms.

<cid>: PDP context ID, range is 1-5,default value is 1

Example

```
AT+ZHTTPURL=http://www.example.com,100,2
OK
AT+ZHTTPURL?
+ZHTTPURL: http://www.example.com

OK
```

15.3. +ZHTTPGET Send GET Request to HTTP Server

Send GET Request to HTTP Server after the URL of HTTP server is set. If all the set value is available, it will return the response data from HTTP server with OK; if there is error, it will return the response data from HTTP server with ERROR.

If there is no response from server, it will return ERROR only.

Command	Response
+ZHTTPGET	<CR><LF><HTTP SEVER RESPONS><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<HTTP SEVER RESPONS>: HTTP server response message, including response header/context. For details please refer to HTTP protocol.

Example

```
AT+ZHTTPGET
HTTP/1.1 200 OK
Connection: keep-alive
Server: meinheld/0.6.1
Date: Mon, 29 Jan 2018 06:45:20 GMT
Content-Type: application/json
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
X-Powered-By: Flask
X-Processed-Time: 0.00139808654785
Content-Length: 190
Via: 1.1 vegur

{
"args": {},
"headers": {
"Accept": "*/*",
"Connection": "close",
"Host": "www.httpbin.org"
  },
"origin": "113.200.107.105",
"url": "http://www.httpbin.org/get"
}

OK
```

15.4. +ZHTTPPOST Send POST Request to HTTP Server

Send POST Request to HTTP Server after the URL of HTTP server is set. If all the set value is available, it will return the response data from HTTP server with OK; if there is error, it will return the response data from HTTP server with ERROR.

If there is no response from server in <input_time> seconds, it will return ERROR only.

Command	Response
+ZHTTPPOST=<content_type>,<content_length>[,<input_time>]	<CR><LF>><data><CR><LF> <SEVER RESPONSES> <CR><LF>OK<CR><LF> or

	<CR><LF>><data><CR><LF> <SEVER RESPONSES> <CR><LF>ERROR<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPPOST=?	<CR><LF>+ZHTTPPOST: (0-1),(1-1024),(0-60)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<content_type>: the value can be 0-1, the content type of POST request(The message body)

0 Content-Type: text/html

1 Content-Type: application/json

255 use the customheader set by command +ZHTTPCFG

<content_length>: the value can between 0-1024, the content length of POST request(The message body)

<time_out> : the value can between 0-60, the unit is second. When the value is set to 0, it stands not enable timeout mode.

<data>: The input parameter of the post request. When the length of the parameter reaches the length of <content_length>, it will end automatically.

<SEVER RESPONSES>: http server response. For details, please refer to the HTTP protocol specification.

Example

```
at+zpas?
+ZPAS: "LTE","CS_PS","FDD"

OK

AT+ZDATACFG=1,"IP","CTNET"              //Set Operator APN
OK
AT+ZDATAACT=1               //Activate PDP connection
OK

at+zhttpurl=http://58.215.47.25:8080/WSFUN/get_car_arrange_info
OK

at+zhttpurl?
+ZHTTPURL: http://58.215.47.25:8080/WSFUN/get_car_arrange_info
OK

at+zhttpget
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Content-Type: application/json;charset=UTF-8
Transfer-Encoding: chunked
Date: Tue, 05 Sep 2017 09:06:30 GMT

{"data":null,"key":100,"list":null,"list1":null,"map":null,"message":"exception","token":null}
OK
```

```
at+zhttppost=1,146
>
{"appid":"0CBE4C20","rnum":"145499","token": "1661847E53AEA438BDD692519E7B2602","paras":
[{"TIMESTAMP":"0","CITY": "1","AREA":"1","CARNUM": "9"}]}                    //(sending content)
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Content-Type: application/json;charset=UTF-8
Content-Length: 62
Date: Tue, 05 Sep 2017 09:07:24 GMT

{
        "filename":"",
        "hasdata":0,
        "message":"ok",
        "status":0
}
OK
```

15.5. +ZHTTPSGET Send GET request to HTTPS server

This command is supported on **ME3630E1CV1.0B15/ME3630E2CV1.0B05 and above version and ME3630-A series** modules.

Send GET request to server after set URL of HTTPS server. If all the set is right, the server will response get request and send OK. If something is wrong, the server will response and send error. If the server no response for the request the module just send ERROR.

Command	Response
+ZHTTPSGET	<CR><LF><HTTP SEVER RESPONS><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<HTTPS SEVER RESPONS>: server response information, including response head and context. For details please refer to the HTTPS protocol.

Example

```
AT+ZDATACFG=1,"IP","CTNET"              //Set Operator APN
OK
AT+ZDATAACT=1               //Activate PDP connection
OK
at+zhttpurl=https://219.144.130.27/

OK
at+zhttpurl?
+ZHTTPURL: https://219.144.130.27/

OK
```

```
at+zhttpsget
<html><body><h1>It works!</h1></body></html>

OK
```

15.6. +ZHTTPSPOST send POST request to HTTPS server

This command is supported on **ME3630E1CV1.0B15/ME3630E2CV1.0B05 and above version and ME3630-A series** modules.

Send POST request to server after set URL of HTTPS server. If all the set is right, the server will response get request and send OK. If something is wrong, the server will response and send error. If the input is not completed within <input_time> second, the ERROR is returned.

Command	Response
+ZHTTPSPOST=<content_type>,<content_length>[,<input_time>]	<CR><LF>><data><CR><LF> <SEVER RESPONSES> <CR><LF>OK<CR><LF> or <CR><LF>><data><CR><LF> <SEVER RESPONSES> <CR><LF>ERROR<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPSPOST=?	<CR><LF>+ZHTTPSPOST: (0-1),(1-1024),(0-60)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<content_type>: value 0-1, POST submit data(message body) code type

0 Content-Type: text/html

1 Content-Type: application/json

255 use the customheader set by command +ZHTTPCFG

<content_length>: value 0-1024, POST submit data(message body) length

<input_time>: value 0-60, unit S(second), time-out time, 0 means disabled time-out deferred.

<data>: post request input parameter, when the parameter length longer than <content_length>, automatic end

<SEVER RESPONSES>: http server response. For details refer to HTTPS protocol.

Example

```
AT+ZDATACFG=1,"IP","CTNET"          //Set Operator APN
OK
AT+ZDATAACT=1              //Activate PDP connection
OK
at+zhttpurl=https://219.144.130.27/

OK
at+zhttpurl?
+ZHTTPURL: https://219.144.130.27/

OK
```

```
at+zhttpspost=1,5
>
HTTP/1.1 200 OK
Date: Fri, 16 Mar 2018 06:40:48 GMT
Server: Apache/2.2.21 (Win32) mod_ssl/2.2.21 OpenSSL/0.9.8r
Last-Modified: Sat, 20 Nov 2004 06:16:24 GMT
ETag: "2d0000000113b3-2c-3e94a9010be00"
Accept-Ranges: bytes
Content-Length: 44
Content-Type: text/html
<html><body><h1>It works!</h1></body></html>

OK
```

15.7. +ZHTTPSAVE save file get from HTTP/HTTPS

This command is used to set the function of HTTPSAVE, that is to enable HTTPSAVE function to save the information that get from HTTP/HTTPSGET to appointed file.

Note: The command is only supported by firmware of or above ME3630E1CV1.0B19/GM500U1AV1.0B05/ME3630A1CV1.0B03 currently.

Command	Response
+ZHTTPSAVE=<mode>[, <save_path>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZHTTPSAVE=?	<CR><LF>+ZHTTPSAVE: <mode>, <save_path><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>: Enable to open/close HTTPSAVE function

0 close HTTPSAVE function(default value)

1 open HTTPSAVE function

<save_path>: The file storage path where the http/https get or put information is saved. When <Save_path> is the XXX, the GET or PUT information will be saved directly to the specified file; when <Save_path> is RAM:XXX, the GET or PUT information will be stored in RAM.

XXX: when this parameter is the name of file, the information will be saved to the specified file, and this file will be saved to FLASH, it won't be lost after restart.

RAM:XXXXX: when this parameter begins with RAM, the information will be saved to RAM. And it won't be saved after restart.

Example

```
AT+ZHTTPSAVE=1,gosuncn                    //Open the file storage function and save the GET or PUT information to the gosuncn file
in FLASH.

OK
AT+ZHTTPSAVE=?
+ZHTTPSAVE: <mode>,<save_path>
```

```
OK
AT+ZHTTPGET
OK
```

15.8. HTTP/HTTPS Example

```
+ZREADY

OK

AT+CPIN?
+CPIN: READY

OK
AT+CSQ
+CSQ: 13,99

OK
AT+CREG?
+CREG: 0,1

OK
AT+ZPAS?
+ZPAS: "LTE","CS_PS","FDD"

OK
AT+ZDATACFG=1,"IP","CTNET"
OK
AT+ZDATAACT=1
OK

AT+ZHTTPURL=https://219.144.130.27,1200,1          //http Parameters setting
OK
AT+ZHTTPURL?
+ZHTTPURL: https://219.144.130.27/
OK

AT+ZHTTPPOST=1,5
>
HTTP/1.1 200 OK
Date: Fri, 16 Mar 2018 06:40:48 GMT
Server: Apache/2.2.21 (Win32) mod_ssl/2.2.21 OpenSSL/0.9.8r
Last-Modified: Sat, 20 Nov 2004 06:16:24 GMT
ETag: "2d0000000113b3-2c-3e94a9010be00"
```

```
Accept-Ranges: bytes
Content-Length: 44
Content-Type: text/html
<html><body><h1>It works!</h1></body></html>
OK
```

16. SSL related AT command

The instructions in this section are SSL-related AT commands.

Note: The commands in this chapter are only supported by firmware of or above ME3630E1CV1.0B19/GM500U1AV1.0B05/ ME3630A1CV1.0B03 currently.

16.1. +ZSSLCFG Configuring SSL context parameters

This command is used to configure SSL context parameters. Effective immediately after setting, no power saving.

Command	Response
+ZSSLCFG=<ctx_id>,sslversion,<sslversion>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,ciphersuite,<ciphersuite>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,seclevel,<seclevel>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,ignorelocaltime,<ignorelocaltime>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,negotiatetime,<negotiatetime>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,cacert,<cacert>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,clientcert,<clientcert>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG=<ctx_id>,clientkey,<clientkey>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCFG?	<CR><LF>+ZSSLCFG: ctx_id,sslversion,ciphersuite,seclevel,ignorelocaltime,negotiatetime,cacert,clientcert,clientkey<CR><LF> <CR><LF>OK<CR><LF> or When there is no referenced context: <CR><LF>+ZSSLCFG: 0<CR><LF> <CR><LF>OK<CR><LF>

+ZSSLCFG=?	<CR><LF>+ZSSLCFG: (1-5),sslversion,(0-4)<CR><LF> +ZSSLCFG: (1-5),ciphersuite,(0X0004-0XFFFF)<CR><LF> +ZSSLCFG: (1-5),seclevel,(0-2)<CR><LF> +ZSSLCFG: (1-5),ignorelocaltime,(0-1)<CR><LF> +ZSSLCFG: (1-5),negotiatetime,(10-300)<CR><LF> +ZSSLCFG: (1-5),cacert,<CR><LF> +ZSSLCFG: (1-5),clientcert,<CR><LF> +ZSSLCFG: (1-5),clientkey,<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<ctx_id>:SSL context identifier, in the range of [1, 5].

<sslversion>:SSL version number, see the table below.

sslversion	SSL version number
0	SSLV3.0
1	TLSV1.0
2	TLSV1.1
3	TLSV1.2
255(Defaults)	ALL

<ciphersuite>:The cipher suite identifier, the value is shown in the following table. The current parameter is reserved and does not take effect.

ciphersuite	Cryptographic kit
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
0XC011	TLS_ECDHE_RSA_WITH_RC4_128_SHA
0XC012	TLS_ECDHE_RSA_WITH_3DES_EDE_CBC_SHA
0XC013	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
0XC014	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
0XC027	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
0XC028	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
0XC02F	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
0XFFFF (Defaults)	ALL

<seclevel>: The security level is shown in the table below.

seclevel	Security Level
0	No authentication
1 (Defaults)	Manage server one-way authentication
2	Server and client mutual authentication
Note: If you configure <seclevel> to 1 or 2, you must upload the trusted CA certificate cacert, client certificate clientcert, client private key clientkey to the module through the FILE AT command (+ZFILEUP). Different SSL server certificates are different, and the certificate is applied by the customer.	

<ignorelocaltime>: Ignore the local time stamp, the values are shown in the table below.

ignorelocaltime	Whether to ignore the local time
0	no
1 (Defaults)	yes

<negotiatetime>: Negotiation timeout period, the value range is [10, 300], the unit is second, and the default value is 300.

<cacert>: Trusted certificate file name, string type, without double quotes, valid length range (3, 127), default is empty.

<clientcert>: Client certificate file name, string type, without double quotes, valid length range (3, 127), default is empty.

<clientkey>: Client private key file name, string type, without double quotes, valid length range (3, 127), default is empty.

Example

```
AT+ZSSLCFG=1,sslversion,255
OK
AT+ZSSLCFG=1,ciphersuite,0XFFFF
OK
AT+ZSSLCFG=1,seclevel,1
OK
AT+ZSSLCFG=1,ignorelocaltime,1
OK
AT+ZSSLCFG=1,negotiatetime,300
OK
AT+ZSSLCFG=1,cacert,cacert.pem
OK
AT+ZSSLCFG=1,clientcert,clientcert.pem
OK
AT+ZSSLCFG=1,clientkey,clientkey.pem
OK
```

16.2. +ZSSLOPEN Open a SSL Socket to Connect Remote Server

This command is used to establish a TCP SSL connection with the remote server. The actively reported +ZSSLSTAT indicates the connection status. You need to run the command "AT+ZPDPCALL" to establish a data link.

Command	Response
+ZSSLOPEN=<ctx_id>,<link_id>,<peer_address>,<peer_port>[,<cid>]	<CR><LF>OK<CR><LF> <CR><LF>+ZSSLSTAT: <link_id>,<state><CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLOPEN?	Return when there is a valid SSL connection: <CR><LF>+ZSSLOPEN:<ctx_id>,<link_id>,<peer_address>,<peer_port><CR><LF> [...] <CR><LF>OK<CR><LF> or Return when there is no valid SSL connection: <CR><LF>+ZSSLOPEN: 0<CR><LF> <CR><LF>OK<CR><LF>

+ZSSLOPEN=?	<CR><LF>+ZSSLOPEN: (1-5),(1-5),,(1-65535)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<ctx_id>: SSL context identifier, in the range of (1, 5).

<link_id>: The SSL connection ID, in the range of (1, 5).

<peer_address>: The IP address (in dotted decimal format) or domain name of the remote server.

<peer_port>: The port number of the remote server, in the range (1, 65535).

<state>: The status of the SSL connection, 0 means off and 1 means on.

<cid>: PDP context identifier, ranging from (1,5), with a default value of 1.

Example

```
AT+ZDATACFG=1,"IP","CTNET"              //Set Operator APN
OK
AT+ZDATAACT=1                 //Activate PDP connection
OK
AT+ZSSLOPEN=1,1,www.baidu.com,443
OK

+ZSSLSTAT: 1,1
AT+ZSSLOPEN?
+ZSSLOPEN: 1,1,180.97.33.108,443
OK
AT+ZSSLOPEN=?
+ZSSLOPEN: (1-5),(1-5),,(1-65535)
OK
```

16.3. +ZSSLCLOSE Close SSL Connection

This command is used to close the SSL connection, and the connection status is indicated by the actively reported +ZSSLSTAT.

Command	Response
+ZSSLCLOSE =<link_id>	<CR><LF>+ZSSLSTAT: <link_id>,<state><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLCLOSE?	<CR><LF>+ZSSLCLOSE: [(1, 0)[,(2, 0)[,(3, 0)[,(4, 0)[,(5, 0)]]]]]<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>+ZSSLCLOSE: 0<CR><LF> <CR><LF>OK<CR><LF>
+ZSSLCLOSE=?	<CR><LF>+ZSSLCLOSE: (1-5)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<link_id>: The SSL connection ID, in the range of (1, 5).

<state>: The status of the SSL connection, 0 means off and 1 means on.

Example

```
AT+ZSSLCLOSE=1
OK

+ZSSLSTAT: 1,0
AT+ZSSLCLOSE?
+ZSSLCLOSE: (1,0),(2,0),(3,0),(4,0),(5,0)
OK
AT+ZSSLCLOSE=?
+ZSSLCLOSE: (1-5)
OK
```

16.4. +ZSSLSEND Send data(ASCII)via SSL Connection

This command is used to send the ASCII code corresponding to the data. The data can only be sent when the connection is open.

Command	Response
+ZSSLSEND=<link_id>, <data>	<CR><LF>OK<CR><LF> <CR><LF>+ZSSLSEND: <link_id>,<length><CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLSEND?	<CR><LF>+ZSSLSEND: <link_id>,<length><CR><LF> (For all opened links) <CR><LF>OK<CR><LF>

Parameter

<link_id>: The SSL connection ID, in the range of (1, 5).

<data>: The ASCII code content corresponding to the data has a data length of up to 1024 bytes (the corresponding ASCII code length is up to 2048 bytes), and the data is encoded in hexadecimal.ex:"48656C6C6F21" Stands for"Hello!".

<length>: Length of data sent.

Example

```
AT+ZSSLSEND=1,48656C6C6F21
OK

+ZSSLSEND: 1,6
AT+ZSSLSEND?
+ZSSLSEND: 1,6

OK
```

16.5. +ZSSLRECV Receive Data via SSL Connection

This command is an active report type and is used to report data received on an SSL connection. After receiving the data, it will be reported automatically. The maximum reported data length is 1024 bytes (the corresponding ASCII code length is up to 2048 bytes). The client buffer length should consider the length of the header outside the data length. It is recommended to add 128 bytes.

Command	Response
	<CR><LF>+ZSSLRECV: <link_id>,<peer_address>,<peer_port>,<length>,<data><CR><LF>

Parameter

<link_id>: SSL connection identifier, valid range is (1, 5).

<peer_address>: IP address of the remote server (in dotted decimal format).

<peer_port>: The port number of the remote server.

<length>: The length of the reported data.

<data>: The reported data, the default format is the original data, if you need to convert to ASCII encoding format, please use the command +ZSSLSETRPT to set.

Example

```
+ZSSLRECV: 1,180.97.33.108,443,28,HTTP/1.1 400 Bad Request


AT+ZSSLSETRPT=0
OK
+ZSSLRECV: 1,180.97.33.107,443,28,485454502F312E312034303020426164205265717565737 40D0A0D0A
```

16.6. +ZSSLSTAT Query the State of SSL Connection

This command is used to get the status of the SSL connection. When the status of the SSL connection changes, "+ZSSLSTAT: <link_id>, <state>" is also reported.

Command	Response
+ZSSLSTAT=<link_id>	<CR><LF>+ZSSLSTAT: <link_id>,<state><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLSTAT=?	<CR><LF>+ZSSLSTAT: (1-5)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<link_id>: The SSL connection ID, in the range of (1, 5).

<state>: The status of the SSL connection, 0 means off and 1 means on.

Example

```
AT+ZSSLSTAT=1
+ZSSLSTAT: 1,1


OK
AT+ZSSLSTAT=?
+ZSSLSTAT: (1-5)


OK
```

16.7. +ZSSLSETRPT Set the display format of the received data

This command is used to set the display format of the received data.

Command	Response
+ZSSLSETRPT=<view_mode>	<CR><LF>OK <CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLSETRPT?	<CR><LF>+ZSSLSETRPT: <view_mode><CR><LF> <CR><LF>OK <CR><LF>

+ZSSLSETRPT=?	<CR><LF>+ZSSLSETRPT: (0,1) <CR><LF> <CR><LF>OK <CR><LF

Parameter

<view_mode>: The display format of the received data, 0 means ASCII encoding format, 1 means raw data format, default value is 1.

Example

```
AT+ZSSLSETRPT=0
OK
AT+ZSSLSETRPT?
+ZSSLSETRPT: 0
OK
AT+ZSSLSETRPT=?
+ZSSLSETRPT: (0,1)
OK
```

16.8. +ZSSLSENDRAW Send raw data via SSL Connection

This command is used to send the original data. After successful execution, the module will receive the original data from the serial device until the received data length exceeds the set length or the reception timeout expires.

Command	Response
+ZSSLSENDRAW=<link_id>,<length>[,<timeout>]	<CR><LF>><data><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZSSLSENDRAW=?	<CR><LF>+ZSSLSENDRAW: (1-5),(1-1024),(0-60)<CR><LF>

Parameter

<link_id>: The SSL connection ID, in the range of (1, 5).

<length>: The length of the data to be sent, in the range of (1, 1024).

<timeout>: The timeout period, in the range of (0, 60), in seconds, 0 means that the timeout mechanism is not enabled.

Example

```
AT+ZSSLSENDRAW=1,10
> 0123456789          // Send data
OK
```

16.9. SSL Example

```
+ZREADY                  // Module power-on active reporting

AT+CPIN?                 //Query SIM card status
+CPIN: READY

OK
AT+CSQ                   //Query signal strength
+CSQ: 16,99
```

```
OK
AT+CREG?                    // Query network status
+CREG: 0,1

OK
AT+ZDATACFG=1,"IPV4V6","3gnet"
OK
AT+ZDATAACT=1
OK
AT+ZDATAACT?
+ZDATAACT: 1,"IPV4",10.109.94.160,221.11.1.67,221.11.1.68
+ZDATAACT: 1,"IPV6",2408:84fb:1220:19df:e096:86ae:6c03:8810,2408:8888::8,2408:8899::8

OK
AT+ZSSLCFG=1,seclevel,0        //Do not authenticate the peer server (encrypted data only)
OK
AT+ZSSLOPEN=1,1,www.example.com,443            // Connect to remote server
OK

+ZSSLSTAT: 1,1       // server connected success
AT+ZSSLOPEN?          // Query the established connections
+ZSSLOPEN: 1,1,72.52.4.119,443
OK
AT+ZSSLSEND=1,3131313131     //Send data in HEX format
OK

+ZSSLSEND: 1,5

+ZSSLRECV: 1,72.52.4.119,443,5,11111    // Receive Data via SSL Connection

AT+ZSSLCLOSE=1          // Close SSL connection
OK

+ZSSLSTAT: 1,0
```

17. MQTT Related AT Command

17.1. +ZMQNEW Create a new MQTT connection

This command is used to establish a new MQTT connection with the MQTT server via the TCP protocol. Up to 5 new MQTT connections can be established.

This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQNEW=<mqtt_id>,<server>,<port>,<command_timeout_ms>,<bufsize>[,<cid>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link id, module can create up to 5 new MQTT connections.

0 Invalid socket identification number

1-5 Valid socket identification number

<server>: String, the IP address of the MQTT server.

<port>: String, MQTT server port number.

<command_timeout_ms>: Unsigned integer, MQTT connection timeout (when MQTTS service, this parameter only affects the TLS handshake link), in milliseconds. The range is 500-100000.

<bufsize>: Unsigned integer, the size of the transmit and receive buffers, in bytes. It is recommended not to exceed 10K. This value indicates the size of the MQTT PDU that is temporarily sent and received. Send the size setting as needed. If the setting is too large, it will cause memory waste.

<cid>: PDP context identifier, ranging from 1-5, default is 1.

Example

```
AT+ZMQNEW=1,219.144.130.26,1883,12000,100,1          //Establish a link with the MQTT server via TCP.
OK
```

17.2. +ZMQCON Configure CONNECT parameter & send link message to MQTT server

This command is used to configure the CONNECT parameter and send an MQTT CONNECT link message to the server.

This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQCON=<mqtt_id>,<version>,<client_id>,<keepalive_interval>,<cleansession>,<will_flag>[,<will_options>][,<username>,<password>]	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<version>: Integer, MQTT protocol version, 3 or 4

3 MQTT protocol v3

4 MQTT protocol v4

<client_id>: String, client ID,Client_id only.

<keepalive_interval>: Integer, Keep the connection interval. It defines the maximum time interval between messages received from the client. Unit: Second, the value range is 0 ~ 65535, and 12000 is recommended. The MQTT server disconnects the link for some reason, so it is not recommended to set it to a value that is too small.

0 The timeout mechanism is not enabled, the client does not actively disconnect the link (except for calling AT+ZMQDISCON).

<cleansession>: Integer, Clean up session, 0 or 1.

0 After the Client disconnects, the Server should save the subscription information of the Client.

1 Indicates that the server should immediately discard any session state information.

<will_flag>: Integer, will flag, 0 or 1(Is 1: indicates the option with the back)

0 Ignore the Will flag configuration

1 Require the Will flag configuration

<will_options>: string, Optional, This option must be included if will_flag is 1. will_flag format:

topic=xxx,QoS=xxx,retained=xxx,message_id=xxx,message=xxx

<username>: string, username(Optional).

<password>: string, password(Optional).

Example

AT+ZMQCON=1,4,myclientid,1000,1,0,admin,password -------- Send MQTT connection message. OK

17.3. +ZMQCFG Configure Parameters of MQTT

The command is used to configure optional parameters of MQTT. This command will take effect once setting, and won't be saved after restart.

Command	Response
+ZMQCFG=<mqtt_id>,<key>,<value>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>
+ZMQCFG=<mqtt_id>,<key>	<CR><LF>+ZMQCFG: <key>,<value><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>
+ZMQCFG=<mqtt_id>	<CR><LF>+ZMQCFG: mqtt_id,<mqtt_id><CR><LF> <CR><LF>+ZMQCFG: SSL,<value><CR><LF> <CR><LF>+ZMQCFG: CACERT,<value><CR><LF> <CR><LF>+ZMQCFG: CLIENTCERT,<value><CR><LF> <CR><LF>+ZMQCFG: CLIENTKEY,<value><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: MQTT socket identifier. The range is 1-5.

<key>: The key of configuration. It can be any of the following types:

key	
SSL	Enable/disable SSL
CACERT	CA CA Certificate
CLIENTCERT	Client Certificate
CLIENTKEY	Client key

<value>:

key	value
SSL	0: disable SSL 1: enable SSL
CACERT	CA Certificate file name, Length: 0~128
CLIENTCERT	Client Certificate file name, Length: 0~128
CLIENTKEY	Client key file name, Length: 0~128

Example

```
AT+ZMQCFG=1,SSL,0
OK

AT+ZMQCFG=1,CACERT,ca.crt
OK

AT+ZMQCFG=1,CLIENTCERT,cli.crt
OK

AT+ZMQCFG=1,Clientkey,cli.key
OK

AT+ZMQCFG=1,SSL
+ZMQCFG: SSL:0

OK

AT+ZMQCFG=1
+ZMQCFG: mqtt_id,1
+ZMQCFG: SSL,0
+ZMQCFG: CACERT,ca.crt
+ZMQCFG: CLIENTCERT,cli.crt
+ZMQCFG: CLIENTKEY,cli.key

OK
```

17.4. +ZMQDISCON Disconnect from the MQTT server

This command is used to send an MQTT disconnect link message, disconnect the TCP link from the MQTT server, and delete the MQTT link information.

This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQDISCON=<mqtt_id>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

Example

```
AT+ZMQDISCON=1                    //Send MQTT disconnect message.
OK
```

17.5. +ZMQDISCON Active report MQTT disconnected indication

This command is used to receive the MQTT disconnect indication because the MQTT service may disconnect the device's MQTT for some reason.

Command	Response
	<CR><LF>+ZMQDISCON:<mqtt_id><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

Example

```
+ZMQDISCON:1                    //Automatically receive MQTT disconnect indication
```

17.6. +ZMQSUB Send MQTT subscription message

This command is used to send MQTT subscription messages. This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQSUB=< mqtt_id>,<topic>,<QoS>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<topic>: string, Subject to the subject of the message, the topic length cannot exceed the buffer size set by the command "AT+ZMQNEW". Because the MQTT PDU contains a topic, the entire MQTT PDU cannot exceed the buffer size.

<QoS>: Integer, The QoS of the message, 0, 1 or 2.

Example

```
AT+ZMQSUB=1,/moekon/substopic,0--------Send a subscribe message
OK
```

17.7. +ZMQUNSUB Send MQTT unsubscribe message

This command is used to send an MQTT unsubscribe message. This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQUNSUB=<mqtt_id>,<topic>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<topic>: string, Subject to the subject of the message, the topic length cannot exceed the buffer size set by the command "AT+ZMQNEW". Because the MQTT PDU contains a topic, the entire MQTT PDU cannot exceed the buffer size.

Example

```
AT+ZMQUNSUB=1,/moekon/substopic--------Send cancels the subscribe message


OK
```

17.8. +ZMQPUB Send MQTT publish messages

This command is used to send MQTT publish messages. This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQPUB=<mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>,<message>	<LF><CR>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<topic>: string, the subject of the published message, the topic length cannot exceed the buffer size set by the command "AT+ZMQNEW". Because the MQTT PDU contains a topic, the entire MQTT PDU cannot exceed the buffer size.

<QoS>: Integer, The QoS level at which the client wants to publish the message. The QoS of the message, 0, 1, or 2.

0 At most once

1 At least once

2 Exactly once

<retained>: Integer, Retention flag, whether the server keeps the message after passing the message to the current subscriber (0: no message is retained. 1: message is reserved).

<dup>: Integer, Packet delivery timeout resend flag, 0 or 1

0 First send

1 Repeat sending

<message_len>: Integer, The length of the published message.

<message>: string, the content of the published message must be an ASCII code string. Other characters are not supported, otherwise the sent data is empty.

Example

```
AT+ZMQSETRPT=0                          //Set the display format of the received data HEX
OK
AT+ZMQPUB=2,/moekon/substopic2,1,0,0,4,31323334
OK

+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,31323334                  //Will automatically receive the returned PUBLISH message

AT+ZMQSETRPT=1                          //Set the display form of the received data. Raw data
OK
AT+ZMQPUB=2,/moekon/substopic2,1,0,0,4,31323334
OK

+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,1234                  //Will automatically receive the returned PUBLISH message
```

17.9. +ZMQPUBRAW Send MQTT publish messages(RAW)

This command is used to send MQTT publish messages. This command only supports setting commands and does not support testing and querying instructions.

Command	Response
+ZMQPUBRAW=<mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>	<LF><CR>><data_content> <LF><CR>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<topic>: string, the subject of the published message, the topic length cannot exceed the buffer size set by the command "AT+ZMQNEW". Because the MQTT PDU contains a topic, the entire MQTT PDU cannot exceed the buffer size.

<Qos>: Integer, The QoS of the message, 0, 1 or 2.

<retained>: Integer, Reserved flag, 0 or 1 (0: no message is retained. 1: message is reserved).

<dup>: Integer, Repeat flag, 0 or 1 (0: first transmission; 1 repeated transmission).

<message_len>: Integer, The length of the published message.

<data_content>: The actual content of the message to be sent, which is the raw data.

Note: 1. This command will send data only when the input data length reaches the length specified in the command. If no data is input, the default 60s will time out and report ERROR, and the data mode will return to the command mode. 2. The timeout period of the command to send data to the air interface can be set by the AT+ZMQNEW command.

Example

```
AT+ZMQSETRPT=1-------Set the display form of the received data. Raw data
OK
AT+ZMQPUBRAW=2,/moekon/substopic2,1,0,0,4    -------- Send an MQTT to publish the message, and the message is "1234".
>
```

```
OK

+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,1234
AT+ZMQSETRPT=0-------Set the display format of the received data HEX
OK
AT+ZMQPUBRAW=2,/moekon/substopic2,1,0,0,4    -------- Send an MQTT to publish the message, and the message is "1234".
>
+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,31323334
```

17.10. +ZMQRCV Actively report received MQTT publish message

This command is used to receive MQTT publish messages.

Command	Response
	<CR><LF>+ZMQRCV: <mqtt_id>,<topic>,<QoS>,<retained>,<dup>,<message_len>,<message><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

Example

```
AT+ZMQSETRPT=0-------Set the display format of the received data HEX
OK
AT+ZMQPUB=2,/moekon/substopic2,1,0,0,4,31323334
OK

+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,31323334-------Will automatically receive the returned PUBLISH message

AT+ZMQSETRPT=1-------Set the display form of the received data. Raw data
OK
AT+ZMQPUB=2,/moekon/substopic2,1,0,0,4,31323334
OK

+ZMQRCV: 2,/moekon/substopic2,0,0,0,4,1234-------Will automatically receive the returned PUBLISH message
```

17.11. +ZMQSTAT Get the SOCKET status

This command is used to get the connection status of the socket.

Command	Response
+ZMQSTAT=<Socket id>	<CR><LF>+ZMQSTAT: <mqtt_id>,<Status><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>

Parameter

<mqtt_id>: Integer, MQTT link ID

0 Invalid socket identification number

1-5 Valid socket identification number

<Status>: Socket connection status

0 Socket connection closed

1 The socket connection is open, and data can be sent or received normally.

Example

```
AT+ZMQSTAT=1
+ZMQSTAT: 1,1
OK
```

17.12. +ZMQSETRPT Set the display form of the received data

This command is used to set the display form of the received data. This command takes effect immediately after it is set, and is not saved when power is turned off.

Command	Response
+ZMQSETRPT=<mode>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR: <err><CR><LF>
+ZMQSETRPT=?	<CR><LF>+ZMQSETRPT: (0,1)<CR><LF> <CR><LF>OK<CR><LF>
+ZMQSETRPT?	<CR><LF>+ZMQSETRPT: <mode><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>:

0 HEX DATA

1 RAW DATA(default)

Example

```
AT+ZMQSETRPT=1
+ZMQTTSETRPT: 1

OK
AT+ZMQSETRPT=?
+ ZMQTTSETRPT: (0,1)

OK

AT+ZMQSETRPT?
+ZMQTTSETRPT: 1
OK
```

17.13. Related MQTT ERROR code

The error code of <CR><LF>ERROR: <err><CR><LF> in this chapter are shown as follows:

ERROR code	Meaning
1000	Parameter error

1001	The network is not connected (the MQTT operation needs to be connected to the Internet first)
1002	DNS fail
1003	No MQTT connection available (need to execute new/connect first)
1004	Link already exists (repeat connection)
1005	Certificate configuration failed/certificate not configured
1006	TCP connect failed
1007	SSL connect failed
1008	MQTT connect failed
1009	MQTT disconnect failed
1010	Failed to send subscription message
1011	Failed to unsubscribe message
1012	Failed to send publication message
……	
1020	Other errors

17.14. Examples: Creating an MQTT Connection

```
+ZREADY       //Module boot report
AT+CPIN?      //Check if the SIM card is valid.
+CPIN: READY

OK
AT+CSQ        //Query signal strength
+CSQ: 13,99

OK
AT+CREG?      //Query module net status
+CREG: 0,1

OK
AT+ZDATACFG=1,"IP","ctnet"
OK

AT+ZDATAACT=1                    //Establish PDP dialup
OK
AT+ZMQNEW=1,124.114.97.22,1883,500,10000,1      //Configuring MQTT
OK
AT+ZMQCON=1,4,myclientid,1000,1,0,admin,password      //Create an MQTT Connection
OK
AT+ZMQSTAT=1          //Query the status of MQTT link 1
+ZMQSTAT: 1,1
OK
AT+ZMQSUB=1,mytopic,1      //Send a subscription message to MQTT
```

```
OK
AT+ZMQSETRPT=1       //Set the display format for receiving MQTT data
OK
AT+ZMQPUB=1,mytopic,1,0,0,4,31323334        //Issue message 1234 to MQTT
OK

+ZMQRCV: 1,mytopic,1,0,0,4,1234          //Received content sent by MQTT
AT+ZMQPUBRAW=1,mytopic,1,0,0,8       //Transparent transmission of data packets to MQTT
>                                    //Published message, transparent transmission, not displayed on the port
OK

+ZMQRCV: 1,mytopic,1,0,0,8,12345678          //Received the message published by the MQTT server 12345678
AT+ZMQSETRPT=0                       //Set the display format of the data received to the MQTT server to HEX.
OK
AT+ZMQPUB=1,mytopic,1,0,0,8,31323334       //Publish message hex format data to MQTT 1234
OK

+ZMQRCV: 1,mytopic,1,0,0,4,31323334          //Received data published by the server, HEX format display
AT+ZMQPUBRAW=1,mytopic,1,0,0,8               //Publish MQTT transparent data
>                                    //Transparent transmission of data, the port does not display
OK
+ZMQRCV: 1,mytopic,1,0,0,8,3132333435363738      //Received data published by the server, HEX display
AT+ZMQUNSUB=1,mytopic            //Cancel the MQTT subscription
OK
AT+ZMQDISCON=1                 //Disconnect the MQTT
OK
```

18. File Operation Related AT Command

Note: The commands in this chapter are only supported by firmware of or above ME3630E1CV1.0B19/ GM500U1AV1.0B05/ ME3630A1CV1.0B03 currently.

18.1. +ZFILEPUT Upload File

This command is used to upload files.

Command	Response
+ZFILEPUT=<filename>,<filesize>[,<timeout>]	<CR><LF>><CR><LF> CONTENT <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<filename>: file name

“filename”: Upload the file to FLASH (power-down save)

“RAM:filename”: Upload the file to RAM (not saved when power off)

<filesize>: The length of the uploaded file, in bytes (maximum 4M)

<timeout>:Timeout time, in seconds (when set to "0", it means no timeout is set, waiting for the file transfer to complete after exiting), the default timeout is not set to 0.

Example

```
AT+ZFILEPUT=gosuncn,20,0                    //Upload file to flash
>
01234567890123456789

OK
AT+ZFILEPUT=?
+ZFILEPUT: <filename>,<filesize>,<timeout>

OK
AT+ZFILEPUT=RAM:gosuncn1,20,0        //Upload file to RAM
>
01234567890123456789

OK
```

18.2. +ZFILEDEL Delete Files

This command is used to delete the specified file.

Command	Response

+ZFILEDEL=<filename>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<filename>:file name

“filename”:Delete the file from the specified FLASH directory

“RAM:filename”: Remove from RAM

Example

```
AT+ZFILEDEL=gosuncn
OK
```

18.3. +ZFILELIST Query file information

This command is used to query file information.

Command	Response
+ZFILELIST=<filename>	<CR><LF>+ZFILELST: <filename>, <filesize><CR><LF> or <CR><LF>+ZFILELST: <filename> not exist.<CR><LF> OK

Parameter

<filename>: file name

“*”: List all file information in FLASH

“RAM:*”:List all file information in RAM

“filename”:Query this file in FLASH

“RAM:filename”:Query in RAM

<filesize>: File content length, unit byte

Example

```
at+zfilelist=*
+ZFILELST:test.txt,20
OK
at+zfilelist=RAM:*
+ZFILELST: tmp_file.tmp,10
OK
at+zfilelist= test.txt
+ZFILELST: test.txt,20
OK
```

18.4. +ZFILEDWL Download file

This command is used to download file information.

Command	Response
+ZFILEDWL=<filename>,[<offset>,<length>]	<CR><LF>+ZFILEDWL:<downlength><CR><LF> CONTENT

	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<filename>: file name

“filename”: Specify files in FLASH

“RAM:filename”: Specify files in RAM

<offset>: The number of bytes moved by the file pointer (offset)

<length>: File content length

Example

```
at+zfiledwl=test.txt
+ZFILEDWL: 20
01234567890123456789
OK
```

19. FOTA Related Commands*

Note: The commands in this chapter are extended and only supported on the latest software version.
Before downloading the differential package, it is necessary to ensure that the module can be connected to the network and dial up normally.

19.1. +ZFOTADL Differential package download& Update

This command is used to start FOTA upgrade. Before using this command, you need to establish TCP data link successfully.

Command	Response
+ZFOTADL=<server_url>	If the parameter is valid, enter the differential package download and return: <CR><LF>OK<CR><LF> <CR><LF>+FOTAIND: <status><CR><LF> Otherwise, return: <CR><LF>ERROR<CR><LF>

Parameter

<server_url>: String type, the maximum length is 255 bytes, no quotation marks are required. If the FTP protocol is used to download, it should start with "FTP://" (both upper and lower case); if it is the HTTP protocol, this should start with "HTTP://" (both upper and lower case):

✧ FTP protocol url format: FTP://<username>:<password>@<serverURL>[:<port>]/<file_path>

<username>: FTP server username

<password>: FTP server password

<serverURL>: FTP server URL or IP address

<port>: FTP server port, the parameter range is 1-65535, which can be default. The default value of the FTP protocol is 21

<file_path>: The full path and name of the FOTA upgrade package

✧ HTTP protocol url format: HTTP://<serverURL>[:<port>]/<file_path>

<serverURL>: HTTP server URL or IP address

<port>: The value range is 1-65535, which can be defaulted. The default value of HTTP protocol is 80

<file_path>: FOTA upgrade package name

<status>: Update status report.

+FOTAIND: DOWNLOADING	start downloading the upgrade package
+FOTAIND: UPDATING	upgrading
+FOTAIND: SUCCESS_END	Upgrade succeeded
+FOTAIND: FAIL_END	Upgrade failed

Note:

1. Use the FTP protocol to download the differential package, which is to transmit data in passive (Passive) mode and binary (Binary) mode.
2. Because the <server_url> parameter has file names, multiple differential package files can be placed under the same path. The module will perform md5 verification on the downloaded differential package, if the current version does not match during the upgrade after restarting, the upgrade will fail.
3. The entire upgrade process takes about several minutes, and the actual time is related to the network condition.
4. During the upgrade process, the module cannot be powered off, and cannot use the USB port or serial port to send AT commands, otherwise the module will be abnormal.

5. After the differential upgrade of the module is completed, it will automatically restart, and the upgrade result will be reported. If the upgrade is successful, the target version will be run.

4. During the module upgrade process, there will be upgrade progress + FOTAIND report.

Example

```
HTTP-FOTA：
AT+ZDATAACT=1
OK

AT+ZFOTADL=http://39.104.78.27/static/ME3630J/update_up.zip
OK

+FOTAIND: DOWNLOADING

+FOTAIND: UPDATING

+FOTAIND: SUCCESS_END                    // After the Fota upgrade is completed, the module is restarted and reported

FTP-FOTA：
AT+ZDATAACT=1
OK

AT+ZFOTADL=ftp://test:test@219.144.130.27:21/FotaTest/ME3630/ME3630J/update_down.zip
OK

+FOTAIND: DOWNLOADING

+FOTAIND: UPDATING

+FOTAIND: SUCCESS_END     // After the Fota upgrade is completed, the module is restarted and reported
```

20. Extended commands*

20.1. +ZCLRACQ Clear the historical earfcn/uarfcn

This command is supported on ME3630-A series modules and ME3630J2AV1.0B10 version or above version, and this command is used to clear the historical earfcn/uarfcn(Absolute Radio Frequency Channel Number of the BCCH carrier) of LTE/UMTS. The module will do all frequency search to get the network after restart the module.

Command	Response
+ZCLRACQ=0,<rat><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZCLRACQ=?<CR>	<CR><LF>+CLRACQ: (0,<3,4>)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<rat>: clear the historical earfcn/uarfcn

3 UMTS, clear the historical uarfcn

4 LTE, clear historical earfcn

When this parameter is omitted, it stands for clear all the historical earfcn/uarfcn of LTE and UMTS

Example

```
AT+ZCLRACQ=0
OK
AT+ZCLRACQ=0,3
OK
AT+ZCLRACQ=0,4

OK
AT+ZCLRACQ=?
+ZCLRACQ: (0,<3,4>)

OK
```

20.2. +ZCPWR PIN76 configure the output voltage level of PIN76

This command is used to configure the output voltage level of PIN76,and will take effect once setting, the <val> won't be saved after restart the module.

This command is only supported by firmware of or above DC_GM500U1A,DC_ME3630J2A, DC_ME3630A1C, DC_ME3630E1C

Command	Response
+ZCPWR=<val>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZCPWR?	<CR><LF>+ZCPWR: <val><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZCPWR=?	<CR><LF>+ZCPWR: (0, 1)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<val>: The level of pin76

0 low level

1 high level (1.8V)

Example

```
AT+ZCPWR=0
OK

AT+ZCPWR?
+ZCPWR: 0
OK

AT+ZCPWR=?
+ZCPWR: (0, 1)
OK
```

20.3. +CCED Get neighbour cell Information

This command is only supported by firmware of or above GR501_ME3630E1CV1.0B01, and is used for getting neighbor cell Information

Command	Response
+CCED=0,3	If the cell is of 4G type, it will return: <value0>/<value9> data relating to the main cell: <CR><LF>EARFCN,RSRQ,RSRP,Srxlev,PCI,RSSI,Cell_ID,MCC,MNC,TAC from <value10>/<value17> to <value50>/<value57> data relating to the neighbour cells(every neighbour cell has 8 parameter as follows) : <CR><LF>EARFCN,RSRQ,RSRP,Srxlev,PCI,RSSI,Cell_ID,TAC<CR><LF> <CR><LF>OK<CR><LF> If the cell is of 3G type, it will return: <value0>/<value8> data relating to the main cell: <CR><LF>MCC,MNC,LAC,CI,FREQ,PSC,RSCP,EcIo,BLER from <value9>/<value14> to <value51>/<value56> data relating to cell belonging to the active set or, when the active set is complete, to the neighbour set: <CR><LF>SET_INFO,FREQ,SCR_CODE,RSCP,EcIo,BLER SET_INFO is an integer field that indicates the type of set that the cell belongs to: 0 = active set, 1 = neighbor set. If the cell is of 2G type, it will return: <value0>/<value12> data relating to the main cell as follows:

	MCC,MNC,LAC,CI,BSIC,BCCHFreq(absolute),RxLev,RxLevFull,RxLevSub, RxQual,RxQual Full,RxQual Sub,Idle TS <value13>/<value19> data relating to the first neighbouring cell as follows: MCC,MNC,LAC,CI,BSIC,BCCH Freq (absolute),RxLev <value20>/<value26> data relating to the second neighbouring cell … <value48>/<value54> data relating to the sixth neighbouring cell or <CR><LF>ERROR<CR><LF>
+CCED=?	<CR><LF>+cced=0,3<CR><LF> <CR><LF>OK<CR><LF>
+CCED?	<CR><LF>OK<CR><LF>

Parameter

Parameters	Remarks
<earfcn/arfch>	Absolute Radio Frequency Channel Number of the BCCH carrier
<mcc>	Mobile Country Code
<mnc>	Mobile Network Code
<tac_id>	Tracking Area Code
<cell_id>	Cell identify
<pci>	Physical cell ID
<bsic>	base station identification code
<psc>	primary Scrambing code
<freq>	Frequency
<rscp>	Received Signal Code Power in dBm
<rsrp>	Reference Signal Received Power
<rsrq>	Reference Signal Received Quality
<ecio>	Pilot Strength
<Bler>	Block error rate
<Bcchfreq>	Freq
<Rxlev>	Received signal lever
<RxlevFull>	Received signal lever Full
<RxlevSub>	Received signal lever Sub
<RxQual>	Received signal quality
<RxQual Full>	Received signal quality Full
<RxQual Sub>	Received signal quality Sub
<LAC>	Location area code

Example

When the cell is of 4G type, it returns:

at+cced=0,3

1515,-8.90,-106.70,13,186,-80.80,bb19245,460,1,911b,

1515,-106.70,-8.90,13,186,-80.80,,,

450,-106.70,-9.30,0,186,-88.20,,,
1650,-107.40,-14.50,0,201,-82.90,,,

OK

When the cell is of 3G type, it returns:
at+cced=0,3
460,1,bb1d,3b28,10663,447,-80,-6,99,
1,10663,457,0,0,99,
1,10663,503,-78,-3,99,
1,10663,292,-80,-5,99,
1,10663,502,-86,-9,99,
1,10663,499,-104,-10,99,
1,10663,461,-107,-13,99,
1,10663,493,-107,-13,99,
1,10663,444,-110,-16,99,

OK

When the cell is of 2G type, it returns:
at+cced=0,3
460,0,90f3,4263,62,619,29,65535,65535,7,65535,65535,
460,0,90f3,4264,62,629,0,
460,0,90f3,59a8,47,37,0,
460,0,90f3,571d,30,30,0,
460,0,90f3,4d87,8,25,0,
460,0,90f3,591b,55,36,0,
460,0,90f3,4262,61,634,0,

OK

20.4. +ZRSPEXT query arfcn,RSRP of cell

This command is used to query the antenna sensitivity. Returns the frequency, primary diversity antenna signals and transmit power of the cell.

Note: only before LTE registration is successful, the main &diversity antenna is inserted, it can be reported correctly.

This command is supported by firmware of or above ME3630U1AV1.0B25.

Command	Response
+ZRSPEXT?	<CR><LF>+ZRSPEXT:<arfcn>,<rx_power0>,<rx_power1>,<tx_power><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<arfcn>: Absolute Radio Frequency Channel Number

<rx_power0>: Reference Signal Received Power of main antenna

<rx_power1>: Reference Signal Received Power of div-antenna

<tx_power>: Transmit power

Example

```
AT+ZRSPEXT?
+ZRSPEXT: 1825,-110,-140,99

OK
```

20.5. +ZMODESET Connection Mode Setting

This command is used to set/get Connection Mode Setting, and it is only supported by firmware of or above ME3630J2AMV1.0B05.

Command	Response
+ZMODESET=<Mode>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZMODESET?	<CR><LF>+ZMODESET: <Mode><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZMODESET=?	<CR><LF>+ZMODESET: (0-2)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<Mode>:

0	default value	
1	HS mode	B41 only mode
2	HS+A mode	B1, B18,B41 mode

Example

```
AT+ZMODESET=1

OK

AT+ZMODESET?

+ZMODESET: 1

OK
```

20.6. +ZRTRFST Flow Statistics

This command is used to get Flow Statistics, and it is only supported by firmware of or above ME3630J2AMV1.0B05.

Command	Response
+ZRTRFST=[<Mode>,]<action>	<CR><LF>OK<CR><LF> or

	<CR><LF>ERROR<CR><LF>
+ZRTRFST?	<CR><LF>+ZRTRFST: 0,<Traffic Statistic><LF> +ZRTRFST: 1,<Traffic Statistic><LF> +ZRTRFST: 2,<Traffic Statistic><CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZRTRFST=?	<CR><LF>+ZRTRFST: (0-2),(0)<CR><LF> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<Mode>:

0 default mode

1 HS mode

2 HS+A mode

<Traffic Statistic>: unit:Bytes

0,0 Clear default mode flow traffic

1,0 Clear HS mode flow traffic

2,0 Clear HS+A mode flow traffic

0 Clear all mode flow traffic

Example

```
AT+ZRTRFST=0

OK

AT+ZRTRFST=1,0

OK

AT+ZRTRFST=2,0

OK
AT+ZRTRFST?

+ZRTRFST: 0,0
+ZRTRFST: 1,1000
+ZRTRFST: 2,210000

OK
```

20.7. +ZGSWCHECK Query status of Network card

This instruction is used to Query the egress_flags and igress_flags values of rmnet0.

Note: This AT is only used to locate and debug the exception. If an exception occurs, the dialing is successful but the data is not available.

This instruction is an extended instruction and is currently only supported by firmware of or aboveME3630J2AV1.2B01.

Command	Response
+ZGSWCHECK?	<CR><LF>+ZGSWCHECK: <egress>,<igress><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<egress>: Integer parameter, the status value of the data sent on the wwan port

10 Normal (Default value)

0 abnormal

<igress>: Integer parameter, the status value of the data received on the wwan port

10 Normal (Default value)

0 abnormal

Example

```
AT+ZGSWCHECK?
+ZGSWCHECK: 10,10

OK
```

20.8. +ZDATAROAM Set the Roam status of module

This command is used to set the Roam status of module, and it will take effect once setting.

Note: This is an extended command, and is only supported by module of ME3630-J2A

Command	Response
+ZDATAROAM =<state>	<CR><CR><LF>+ZDATAROAM:Reset is not required <CR><CR><LF><CR> <CR><LF>OK<CR><LF> Or <CR><CR><LF>+ZDATAROAM:Reset is required <CR><CR><LF><CR> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<err><CR><LF>
+ZDATAROAM ?	<CR><CR><LF>+ZDATAROAM: <state><CR><CR><LF><CR> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
+ZDATAROAM =?	<CR><CR><LF>+ZDATAROAM: (0-2) <CR><CR><LF><CR> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Parameter

<state>: Roam status of module, range can be 0-2

0 enable roaming;

1 Disable international roaming;

2 reserved value

Example

```
AT+ZDATAROAM?
+ZDATAROAM: 1

OK
AT+ZDATAROAM=?
+ZDATAROAM: (0-2)

OK
AT+ZDATAROAM=1
+ZDATAROAM:Reset is not required

OK
```