



LTE Standard(A) series

AT command manual

LTE Standard Module Series

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-	2021-09-10	Yule DENG	document creation
1.0	2021-12-13	Yule DENG	controlled version <ul style="list-style-type: none"> 1. Added documents applicable to modules EC200A series, EC800N-CN and EG915N-EU. 2. Delete the command A/. 3. Delete the command AT+QCELL. 4. The newly added EC200A series does not support opening/closing URC cache
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1 Introduction

1.1. Overview of this chapter

This document introduces the AT command set supported by Quectel LTE Standard(A) series modules.

Table 1: Applicable modules

Module series	module
LTE Standard(A)	EC200A series
	EC200M-CN
	EC200N-CN
	EC200S series
	EC600M-CN
	EC600N-CN
	EC600S-CN
	EC800M-CN
	EC800N-CN
	EG912N-EN
	EG912Y-EU
	EG915N series

1.2. Definition

ÿ <CR>	carriage
ÿ <LF>	return. line
ÿ <...>	break. parameter name. Angle brackets are not included in the actual
ÿ [...]	command line. Optional parameter or optional part of the TA info response. The square brackets are not included in the actual command line.
	Unless otherwise specified, when an optional parameter in a configuration command is omitted, its previously set value or its default value will be used by default. ÿ Default settings for underlined parameters.

1.3. AT command statement

The prefix **AT** or **at** must be added at the beginning of each command line. Typing <CR> will terminate the command line. Usually, the command is followed by the form <CR><LF><response><CR><LF>'s response. In tables representing commands and responses in this document, <CR><LF> are omitted, and only commands and responses are shown.

The AT commands implemented by the module can be divided into two types in syntax: basic type, S parameter type and extended type, as listed below.

ÿ Basic class

The format of basic AT commands is **AT<x><n>** or **AT&<x><n>**, where <x> is the command and <n> is the parameter of the command. Take **ATE<n>** as an example, DCE will determine whether to echo the received characters to **DTE according to the value of <n>**. If <n> is an optional parameter, its default value will be used if it is omitted.

ÿ S parameter class

The format of this AT command is **ATS<n>=<m>**, where <n> is the index of the S register, and <m> is the assigned parameter value.

ÿ Extension class

Extended AT commands can be run in various modes, as shown in the table below:

Table 2: AT Command Types

AT command type statement	describe
Test command AT+<cmd>=?	Tests for the existence of a corresponding set command and returns information about the type, value, or range of its arguments.
Query command AT+<cmd>?	Query the current parameter value of the corresponding setting command.
Set command AT+<cmd>=<p1>[,<p2>[,<p3>[...]]] to set user-definable parameter value.	
Execute the command AT+<cmd>	Return specific parameter information or perform specific operations.

Multiple commands can be placed on the same line with a semicolon (;). At this point only the first command is prefixed with **AT**. Commands can be uppercase or lowercase.

Spaces can be ignored when entering AT commands. But the following exceptions:

- ÿ within a quoted string;
- within an unquoted string or numeric parameter;
- ÿ within an IP address; ÿ within =, ?, or = ? in an AT command name .

When entering an AT command, at least one carriage return is required. Line breaks are ignored, so one carriage return/line feed is allowed on input right.

If only the **AT** mark is entered without a command, it will return **OK**; if an invalid command is entered, it will return **ERROR**.

For optional parameters, unless explicitly stated otherwise, need to be entered until the last optional parameter.

1.4. AT command response

When the AT command processor finishes processing a command, it will return **OK**, **ERROR** or **+CME ERROR: <err>**, indicating that it is ready Good to receive new orders. The requested response message is sent before returning a final **OK**, **ERROR** or **+CME ERROR: <err>**.

Following is the format of the response message:

```
<CR><LF>+CMD1: <parameters><CR><LF>
<CR><LF>OK<CR><LF>
```

or

```
<CR><LF><parameters><CR><LF>
<CR><LF>OK<CR><LF>
```

1.5. Supported character sets

The AT command interface of the module uses the **GSM** character set by default, and the supported character sets are as follows:

- ÿ GSM format
- ÿUCS2
- ÿIRA

You can use **AT+CSCS (3GPP TS 27.007)** to configure and query the character set, and define it in **3GPP TS 27.005**

righteous. Character sets affect the sending and receiving of SMS and SMS broadcast messages, and the entry and display of text fields for phonebook entries.

1.6. AT command port

The main serial port and two USB ports (USB MODEM port and USB AT port) support AT command communication and data transmission.

1.7. Unsolicited result codes

As Unsolicited Result Codes and Reporting Messages, URCs are reporting messages issued by the module without a TE request and are issued automatically when certain events occur and are not issued as part of a response related to an executed AT command. Specific events that cause the URC to report include incoming calls (RING), received text messages, high/low pressure alerts, and high/low temperature alerts.

1.8. Close the program

It is the safest way to turn off the module by executing **AT+QPOWD**, so it is recommended to use this method to turn off the module. This process is accomplished by logging the module off the network and allowing the software to enter a safe data state before disconnecting power.

Do not execute any other AT commands after sending **AT+QPOWD**. After successfully executing the command, the module will output the message **POWERED DOWN**, and then enter the shutdown state. In order to avoid data loss, it is recommended to wait 3 seconds to disconnect the power supply after outputting URC **POWERED DOWN**. If **POWER DOWN** is not received after 65 seconds, the power must be forcibly disconnected.

1.9. AT example statement

The examples in this article are only for the convenience of users to understand how to use AT commands, and do not constitute Quectel's suggestions or opinions on the terminal process design, nor does it mean that the module should be set to the state in the corresponding examples. Multiple instances of some AT commands exist without succession or continuity between the instances.

2 common commands

2.1. ATI display MT ID information

This command is used to provide MT ID information.

ATI display MT ID information _	
Excuting an order	response
ATI	Quectel
	<objectID>
	Revision: <revision>
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<objectID> String type. Identifier of the device type. **<revision>**

string type. ID information of MT firmware version.

example

```
ATI
Quectel
EC200NCN
Revision: EC200NCNAAR03A01M08

OK
```

2.2. AT+GMI request manufacturer information

This command has the same effect as **AT+CGMI**, and is used to return manufacturer ID information.

AT+GMI request manufacturer information	
test command	response
AT+GMI=?	OK
Excuting an order	response
AT+GMI	Quectel
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

2.3. AT+GMM requests TA model ID

This command has the same effect as **AT+CGMM**, and is used to return TA model ID information.

AT+GMM request TA model ID	
test command	response
AT+GMM=?	OK
Excuting an order	
AT+GMM	response <objectID>
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<objectID> String type. Identifier of the device type.

2.4. AT+GMR requests TA firmware version ID

This command has the same function as **AT+CGMR**, and is used to provide ID information of TA firmware version.

AT+GMR requests TA firmware version ID	
test command	response
AT+GMR=?	OK
Excuting an order	response
AT+GMR	<revision>
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<revision> string type. TA firmware version ID information, including line terminators, must not exceed 2048 characters in the message text character.

example

```
AT+GMR
EC200NCNAAR03A01M08
OK
```

2.5. AT+CGMI requests manufacturer information

This command has the same effect as **AT+GMI**, and is used to return manufacturer information.

AT+CGMI request manufacturer information	
test command	response
AT+CGMI=?	OK
Excuting an order	response
AT+CGMI	Quectel
	OK

maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

2.6. AT+CGMM requests TA model ID

This command has the same effect as **AT+GMM**, and is used to return TA model ID information.

AT+CGMM request TA model ID

test command	response
AT+CGMM=?	OK
Excuting an order	
AT+CGMM	response <objectID>
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<objectID> String type. Identifier of the device type.

2.7. AT+CGMR requests TA firmware version ID

This command has the same function as **AT+GMR**, and is used to provide TA firmware version ID information.

AT+CGMR request TA firmware version ID

test command	response
AT+CGMR=?	OK
Excuting an order	
AT+CGMR	<revision>
	OK

maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<revision> string type. The ID information of the product firmware version, including line terminators, must not exceed 2048 characters in the message text character.

2.8. AT+GSN requests International Mobile Equipment Identity (IMEI number)

This command has the same effect as **AT+CGSN**, it is used to return the international mobile equipment identity (IMEI number) of ME, allowing the user to identify piece of ME equipment.

AT+GSN requests International Mobile Equipment Identity (IMEI number)	
Test command	response
AT+GSN=?	OK
Excuting an order	response
AT+GSN	<IMEI>
	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<IMEI> String type. The IMEI number of the ME.

Remark

The serial number (IMEI number) is different for each ME device and can therefore be used to identify the ME.

2.9. AT+CGSN requests International Mobile Equipment Identity (IMEI number)

This command has the same effect as **AT+GSN**, and is used to return the international mobile equipment identity (IMEI number) of ME.

AT+CGSN requests International Mobile Equipment Identity (IMEI number)	
Test command	response
AT+CGSN=?	OK
Executing an order	response
AT+CGSN	<IMEI>
	OK
maximum response time	300 milliseconds
Feature Description	/
Refer to 3GPP TS 27.007	

parameter

<IMEI> String type. The IMEI number of the ME.

Remark

The serial number (IMEI number) is different for each ME device and can therefore be used to identify the ME.

2.10. AT&F reset AT command set to factory settings

This command is used to reset the AT command setting to the default value specified by the manufacturer (refer to surface 7).

AT&F reset AT command settings to factory settings	
Executing an order	response
AT&F[<value>]	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<value>	Integer. <u>0</u> Reset all AT command settings to factory settings
----------------------	--

2.11. AT&V display current configuration

This command is used to display the current configuration of some AT command parameters (for details, refer to ^{surface}3), including unreadable single-letter AT command parameters.

AT&V show current configuration

Excuting an order	response
AT&V	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

Table 3: AT&V Response

AT&V	
&C: 1	
&D: 2	
&F: 0	
&W: 0	
E: 1	
Q: 0	
V: 1	
X: 4	
Z: 0	
S0: 0	
S3: 13	
S4: 10	
S5: 8	
S6: 2	
S7: 0	
S8: 2	
S10: 15	
OK	

2.12. AT&W store current settings to user-defined configuration file

This command is used to store the current AT command settings to the user-defined configuration file in NVM (for details, refer to **ATZ**, surface 8). at power-up or the AT command settings will be automatically restored from the user-defined configuration file.

AT&W stores current settings to user-defined profile

Excuting an order	response
AT&W[<n>]	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<n>	Integer. <u>0</u> Profile number. Used to store the current AT command settings
-----	--

2.13. ATZ restores all AT command settings from user-defined configuration files

This command is used to reset the AT command settings to the manufacturer's default settings, similar to **AT&F**. If the AT command setting has been stored in 8) In **AT&W**, restore the AT command settings from the user-defined configuration file in NVM (for details, refer to surface before .

Any other AT commands on the same command line are ignored.

ATZ restores all AT command settings from user defined configuration files

Excuting an order	response
ATZ[<value>]	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<value> integer. <u>0</u> Reset profile number to 0
--

2.14. ATQ setting result code echo mode

This command is used to control whether to send the result code to TE, and other information sent in response will not be affected.

ATQ setting result code echo mode

Excuting an order	
ATQ<n>	<p>Response if <n>=0:</p> <p>OK</p> <p>If <n>=1: (none)</p>
maximum response time	300 milliseconds
Feature Description	<p>This command takes effect immediately; the parameter configuration will be saved after executing AT&W .</p>
refer to V.25ter	

parameter

<n>	Integer. 0 TA sends the result code 1 The result code is prohibited and not sent
-----	--

2.15. ATV TA response format

This command is used to determine the first and last content sent together with the AT command result code and information response.

surface 4 lists the result codes, their numerical equivalents, and a brief description of each usage.

ATV TA Response Format

Excuting an order	
ATV<value>	<p>Response if <value>=0:</p> <p>0</p> <p>If <value>=1:</p> <p>OK</p>
maximum response time	300 milliseconds
Feature Description	<p>This command takes effect immediately; the parameter configuration will be saved after executing AT&W .</p>



refer to
V.25ter

parameter

<value> integer. 0

information return: <text><CR><LF> short

result code format: <numeric code><CR> 1

information return: <CR><LF><text><CR><LF>

Long result code format: <CR><LF><verbose code><CR><LF>

example

```

ATV1 //Set <value>=1
OK

AT+CSQ

+CSQ: 30,99

OK //When <value>=1 , the result code is OK //
ATV0 Set <value>=0

0

AT+CSQ

+CSQ: 30,99 0 //When <value>=0 , the result code is 0

```

Table 4: **ATV0&ATV1** Result Codes Numerical Equivalents and Brief Description

ATV1	ATV0	describe
OK	0	Confirm execution command
CONNECT	1	Connection established; DCE transitioning from command mode to data mode
RING	2	DCE has detected an incoming signal from the network
NO CARRIER	3	The connection was terminated or an attempt to establish a connection failed
ERROR	4	The command is not recognized, the maximum character length of the command line is exceeded, the parameter value is invalid, or other problems processing the command line
NO DIALTONE	6	Dial tone not detected
BUSY	7	Busy (busy tone) signal detected
NO ANSWER	8	@ (wait for silent answer) dial modifier used, connect timer (S7)

Five seconds of silence after no remote ringing is detected before the timer expires.

2.16. ATE setting command echo mode

This command is used to control whether TA echoes the characters received from TE in AT command mode.

ATE set command echo mode

Executing an order ATE<value>	response OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .
refer to V.25ter	

parameter

<value> integer. Whether to echo characters received from TE.

0 off 1 on

—

2.17. ATS3 set command line terminator

This command is used to determine the characters recognized by TA to terminate the entered command line. Simultaneous generation of result codes and message texts as well as set character value.

ATS3 set command line terminator

query command ATS3?	response <n>
	OK
set command ATS3=<n>	response OK
maximum response time	300 milliseconds
Feature Description	/
refer to V.25ter	

parameter

<n> Integer. Command line terminator. Range: 0~127. (default 13=<CR>).

2.18. ATS4 set response format character

This command is used to determine the characters generated by TA for result codes and message text, as well as the command line termination character set by ATS3 .

ATS4 set response format character	
query command	response
ATS4?	<n>
	OK
set command	response
ATS4=<n>	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

parameter

<n> Integer. Response format characters. Range: 0~127. (default 10=<LF>).

2.19. ATS5 set command line editing characters

This command is used to determine the edit character value (equivalent to the backspace key) that TA uses to delete the immediately preceding character from the AT command line.

ATS5 set command line editing characters	
query command	response
ATS5?	<n>
	OK
set command	response
ATS5=<n>	OK
maximum response time	300 milliseconds

Feature Description	/
refer to	
V.25ter	

parameter

<n> Integer. Responses to edit characters. Range: 0~127. (default 8=<Backspace>).

2.20. ATX sets CONNECT result code format and detects call progress

This command is used to determine whether the TA sends a specific result code to the TE. It also controls whether the TA detects dial tone and busy (busy tone) signals when it initiates dialing.

ATX sets the CONNECT result code format and detects the call progress	
Executing an order	response
ATX<value>	OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .
refer to	
V.25ter	

parameter

<value> integer. 0 Return only

CONNECT result code, dial tone and busy tone detection are disabled 1 Only return

CONNECT <text> result code, dial tone and busy tone detection are disabled 2 Return CONNECT

<text> result code, disable busy tone detection, enable dial tone detection 3 Return CONNECT <text> result

code, disable dial tone detection, enable busy tone detection 4 return CONNECT <text> result code, both dial tone and busy tone detection are enabled

2.21. AT+CFUN set function mode

This command is used to control the functional mode and can also be used to reset the UE.

AT+CFUN set function mode	
Test command AT+CFUN=?	response +CFUN: (supported <fun> range), (supported <rst> list)
	OK
Query command AT+CFUN?	response +CFUN: <fun>
	OK
set command AT+CFUN=<fun>[,<rst>]	response OK
	If any error occurs related to ME: +CME ERROR: <err>
maximum response time	15 seconds, depending on network status
Feature Description	/
Refer to 3GPP TS 27.007	

parameter

<fun> Integer. functional mode. 0 Minimal

functional mode 1 Full

functional mode 3 Disable

ME receiving RF signal 4 Disable ME

sending and receiving RF signal function 5 Disable

(U)SIM integer. 0 Do not trigger reset before setting

<rst> to <fun> function mode (default setting when <rst> is

omitted 1 Trigger reset. After reset, the device can be used normally. This value is only applicable

for <fun>=1 <err> error codes. refer to

No. **12.5** chapter

example

AT+CFUN=0	//Set UE to minimum function mode
OK	
AT+COPS?	
+COPS: 0	//No network

```

OK

AT+CPIN?

+CME ERROR: 13 //((U)SIM card reading
AT+CFUN=1 failed//Set UE to full-featured mode

OK

+CPIN: SIM PIN

AT+CPIN=1234

OK

+CPIN: READY

+QUSIM: 1

+QIND: PB DONE

+QIND: SMS DONE

AT+CPIN?

+CPIN: READY

OK

AT+COPS?

+COPS: 0,0,"CHINA MOBILE",7 //Register on the network

OK

```

2.22. AT+CMEE set error message format

This command is used to set the format of the error result code: ERROR, error number or detailed message, such as +CME ERROR: <err> and +CMS ERROR: <err>.

AT+CMEE set error message format

Test	response
command AT+CMEE=?	+CMEE: (supported <n> range)
	OK
query command	response
AT+CMEE?	+CMEE: <n>
	OK

set command AT+CMEE=<n>	response OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<n>	Integer. 0 Disable the result <u>code 1</u> Enable the result code, use a numeric value 2 Enable the result code, use a character value
------------------	--

example

```

AT+CMEE=0                                // disable result code
OK
AT+CPIN?
ERROR                                         //Only display ERROR //
AT+CMEE=1                                Enable numeric result error codes
OK
AT+CPIN?
+CME ERROR: 10
AT+CMEE=2                                // Enable error result codes with verbose (string) values
OK
AT+CPIN?
+CME ERROR: SIM not inserted

```

2.23. AT+CSCS select TE character set

This setting command is used to report the character set used by TE to UE, so that UE can correctly convert characters between TE and UE character sets string.

AT+CSCS select TE character set	
test command AT+CSCS=?	response +CSCS: (list of supported <chset>s)
	OK
query command	response

AT+CSCS?	+CSCS: <chset>
	OK
set command	response
AT+CSCS=<chset>	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<chset> String type.

- "GSM" GSM default character set
- "IRA" International Reference Character Set
- "UCS2" UCS2 character set

example

```

AT+CSCS?                                     //Query the current character
+CSCS: "GSM"                                  set/The character set is GSM

OK

AT+CSCS="UCS2"                           //Set character set to UCS2
OK

AT+CSCS?
+CSCS: "UCS2"                                //After configuration, the query character set is UCS2

OK

```

2.24. AT+QURCCFG configure URC indication options

This command is used to configure the output port of URC.

AT+QURCCFG Configure URC indication options	
test command	response
AT+QURCCFG=?	+QURCCFG: "urcport", (list of supported <urc_port_value>)
	OK
set command	response

AT+QURCCFG="urcport"[,<urc_port_value>]

If the optional parameter is omitted, the current configuration is queried:

+QURCCFG: "urcport",<urc_port_value>**OK**

If optional parameters are specified, configure the output port of the URC:

OK**OR****ERROR**

maximum response time

300 milliseconds

Feature Description

This command takes effect immediately;

the parameter configuration is automatically saved.

parameter

<urc_port_value> string type. Sets the output port of the URC.

"usbat"

USB AT Port

"usbmodem"

USB Modem Port Master

"uart1"

Serial Port

example

AT+QURCCFG=?**+QURCCFG: "urcport",("usbat", "usbmodem", "uart1")****OK****AT+QURCCFG="urcport"****+QURCCFG: "urcport","usbat"****OK****AT+QURCCFG="urcport","usbmodem"****OK****AT+QURCCFG="urcport"****+QURCCFG: "urcport","usbmodem"****OK**

2.25. AT+QPPPDROP terminate PPP connection

This command is used to terminate the PPP connection.

AT+QPPPDROP Terminate PPP connection	
test command	response
AT+QPPPDROP=?	+QPPPDROP: (supported <op> range)
	OK
set command	response
AT+QPPPDROP[=<op>]	OK
maximum response time	300 milliseconds
Feature Description	<p>This command takes effect immediately; the parameter configuration is not saved.</p>

parameter

<op>	Integer. The operation to disconnect the PPP connection. 0 Disconnect PPP connection without sending TERM REQ frame to peer 1 Disconnect PPP connection and automatically send TERM REQ frame to peer 2 Disconnect PPP connection by sending TERM REQ frame to peer
-------------------	---

Remark

1. The command returns OK immediately, and then performs the following steps: Step 1: Check whether the PPP link exists. If yes, go to step 2. Step 2: Disconnect the PPP connection, output **NO CARRIER** from the dial port. 2. If <op> is 1, only when there is a PPP connection and the dial-up port is in data mode, send TERM REQ frame to the opposite end. 3. If <op> is omitted, the disconnection process is the same as when <op> is set to 1.

example

AT+QPPPDROP //Send command from USB_AT port //Receive result
OK from USB_AT port
//The dial-up port of the MCU receives the TERM REQ frame of the module
7E FF 7D 23 C0 21 7D 25 7D 20 7D 24 5C A4 7E

NO CARRIER //The PPP connection has been terminated and the URC is output from the dial port. If ATV0 is set , the module outputs **NO CARRIER** as number format (3)

3 Serial port control commands

3.1. AT&C set DCD signal mode

This command is used to set the DCD signal mode, which is related to detecting the remote line signal.

AT&C set DCD signal mode

Executing an order	response
AT&C[<value>]	OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .
refer to	
V.25ter	

parameter

<value> integer. Determines how the DCD signal correlates to the detected far-end line signal.

- 0 The DCD signal is always on 1 When the carrier
- signal on the network side is detected only, the DCD signal is on

3.2. AT&D set DTR signal mode

This command is used to set the corresponding state of UE after the DTR signal changes from low level to high level when the port is in data mode.

AT&D set DTR signal mode

Executing an order	response
AT&D[<value>]	OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .

refer to
V.25ter

parameter

<value> integer.

0 TA ignores DTR pin signal changes 1 DTR

pull up from low level to high level: maintain call connection and switch to command mode 2 DTR

pull up from low level to high level: disconnect data connection and switch to command mode. When DTR is high, disable the auto-answer function

3.3. AT+IFC to set the flow control mode of the serial port

This command is used to set the flow control mode of serial communication.

AT+IFC sets the flow control mode of the serial port	
Test command	response
AT+IFC=?	+IFC: (list of supported <dce_by_dte>), (list of supported <dte_by_dce>)
	OK
Query	response
command AT+IFC?	+IFC: <dce_by_dte>,<dte_by_dce>
	OK
set command	response
AT+IFC=<dce_by_dte>,<dte_by_dce>	OK
	or
	ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W.
refer to	
V.25ter	

parameter

<dce_by_dte> integer. Specifies the flow control behavior when TE receives data from TA.

0 none

2 RTS flow control

<dte_by_dce> integer. Specifies the flow control behavior of TA when receiving data from TE.

- | | |
|---------------|------------------|
| <u>0</u> none | |
| 2 | CTS flow control |

Remark

1. The value of AT+IFC can be restored by AT&F, ATZ and AT&W. 2. The values of <dce_by_dte> and <dte_by_dce> must be the same.

example

```
AT+IFC=2,2          //Open hardware flow control
OK
AT+IFC?
+IFC: 2,2
OK
```

3.4. AT+IPR set a fixed serial communication baud rate

This command is used to query and set the baud rate of the serial port. The default baud rate value (<rate>) is 115200 bps. The setting of <rate> will not be AT&F recovery.

AT+IPR set a fixed serial communication baud rate

test command	response
AT+IPR=?	+IPR: (auto-detected <rate> list), (fixed <rate> list supported)

OK

Query	response
command AT+IPR?	+IPR: <rate>

OK

set command	response
AT+IPR=<rate>	OK

maximum response time

300 milliseconds

Feature Description

This command takes effect

immediately; the parameter configuration will be saved after executing AT&W .

refer to

V.25ter

parameter

<rate> integer. The baud rate per second. Unit: bps.

4800

9600

19200

38400

57600

115200

230400

460800

921600

Remark

1. If you set a fixed baud rate, please make sure that TE (DTE, usually an external processor) and TA (DCE, Quectel communication module) are set to same baud rate.
2. **The value of AT+IPR cannot be restored by AT&F, ATZ and AT&W.** 3. After the setting command is executed and returns **OK**, the baud rate setting takes effect.

example

```
AT+IPR=115200          //Set the fixed baud rate to 115200 bps
OK
AT&W                  //Save the current configuration, after the module restarts, the serial port communication rate is still 115200 bps
OK
AT+IPR?
+IPR: 115200

OK
AT+IPR=115200;&W //Fix the baud rate to 115200 bps and save the current configuration
OK
```

4 state control commands

4.1. AT+CPAS query ME activity status

This command is used to query the activity status of ME.

AT+CPAS query ME activity status	
test command	response
AT+CPAS=?	+CPAS: (list of supported <pas>s)
	OK
Excuting an order	response
AT+CPAS	TA returns the activity status of MT: +CPAS: <pas>
	OK
	or
	ERROR
	If any error occurs related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<pas>	Integer. 0 ready 2 — unknown 3 ringing 4/6 call in progress or on hold <err>
-------	---

error code. refer to

No. 12.5 chapter*

example

```
AT+CPAS
+CPAS: 0 // in ready state

OK
RING
AT+CLCC
+CLCC: 1,1,4,0,0,"15695519173",161

OK
AT+CPAS
+CPAS: 3 // is ringing the bell

OK
AT+CLCC
+CLCC: 1,0,0,0,0,"10010",129

OK
AT+CPAS
+CPAS: 4 // calling

OK
```

4.2. AT+CEER reports extended error

This command is used to query extended errors and report the reason for the failure of the last operation, for example:

ÿ Failed to make a call. ÿ The
call fails (regardless of whether the mobile phone is the calling or
called). ÿ It is not possible to modify calls via supplementary
services. ÿ Supplementary services cannot be activated, registered, inquired,
deactivated or canceled. ÿ Unable to attach GPRS or activate PDP context. ÿ
Unable to detach GPRS or deactivate PDP context.

AT+CEER reports extended error

Test	response
command AT+CEER=?	OK
Executing an order	response
AT+CEER	+CEER: <text>
	OK

	or ERROR
	If any error occurs related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/

parameter

<text>	String type. Information about the reason for the network delivery failure. The reason for the last call or call failure (see No. 12.9 chapter details). Report CS and PS domain call types. Reason data is obtained from call management events and is Cached locally for later use by this command.
<err>	error code. refer toNo. 12.5 chapter

4.3. AT+QCFG extended command

This command is used to query and configure various settings of UE.

AT+QCFG extended command

test command	response
AT+QCFG=?	+QCFG: "gprsattach", (supported <attach_mode> list), (supported <effect> list) +QCFG: "nwscanmode", (supported <scan_mode> range) +QCFG: "nwscanseq", (supported range of <scanseq>) +QCFG: "roamservice", (list of supported <roam_mode>), (list of supported <effect>) +QCFG: "servicedomain", (supported <service> scope), (supported <effect> list) +QCFG: "band", (supported <bandval> list), (supported <ltebandval> list) +QCFG: "urc/ri/other", (supported <typeRI> list), (supported <pulse_duration> range), (supported <pulse_count> range) +QCFG: "urcdelay", (supported <time> range) +QCFG: "urc/cache", (list of supported <enable>s) +QCFG: "usbnet", (list of supported <net>s) +QCFG: "ppp/termframe", (list of supported <flag>s) +QCFG: "airplanecontrol", (supported <enable> list) +QCFG: "urc/ri/ring", (supported <typeRI> list), (supported <pulse_duration> range), (supported <pulse_count> range)

	+QCFG: "risignaltype", (list of supported <RI_signal_type>s) +QCFG: "uart2ipr", (supported <ipr> list) +QCFG: "nat", (list of supported <nat>s)
maximum response time	300 milliseconds

4.3.1. AT+QCFG="gprsattach" configure GPRS attach mode

This command is used to specify the GPRS attach mode when UE is powered on.

AT+QCFG="gprsattach" configure GPRS attach mode setting command

	Response
AT+QCFG="gprsattach"[,<attach_mode>[,<effect>]]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "gprsattach",<attach_mode>,<effect>
	OK
	If any optional parameter is specified, the GPRS attach mode is configured: OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.

parameter

<attach_mode> Integer. GPRS attach mode when UE is powered on. 0

Attach manually 1 Attach integer automatically. How the command takes effect.
—

<effect>

0 It takes effect after the UE restarts (not supported at the moment) 1 The error code takes effect immediately. refer to
—

<err>

No. 12.5 chapter

Remark

This configuration will affect the network standard supported by the module. For example: if the current network standard includes **LTE network standard**, when **<attach_mode>** is set to 0, the **LTE network standard will be removed**; when **<attach_mode>** is set to 1, the module will restore the LTE network standard.

4.3.2. AT+QCFG="nwscanmode" configure network search mode

This command is used to specify the network system to be searched.

AT+QCFG="nwscanmode" Configure network search mode	
set command	Response
AT+QCFG="nwscanmode"[,<scan_mode>]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "nwscanmode",<scan_mode>
	OK
	If optional parameter is specified, configure network search mode: OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<scan_mode>	Integer. Web search mode. 0 Auto (LTE/WCDMA/GSM) 1 GSM only 2 WCDMA only 3 LTE only Error codes. refer to
--------------------------	--

<err>

No. 12.5 chapter

Remark

If the configured network search mode does not match the current configuration of the module, this command will return an error message. For example: when the network search mode is LTE only, if the module service domain is configured as CS domain only, the command returns an error message.

4.3.3. AT+QCFG="nwscanseq" Configure network search sequence

This command is used to specify the network search order.

AT+QCFG="nwscanseq" Configure network search order setting	
command	Response
AT+QCFG="nwscanseq"[,<scanseq>]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "nwscanseq",<scanseq>
	OK
	If an optional parameter is specified, configures the network search order: OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.
parameter	
<scanseq>	Integer. Web search order. 0 Auto (LTE/WCDMA/GSM) 1 GSM only 2 WCDMA only 3 LTE only 4 GSM/WCDMA/LTE
	5 WCDMA/GSM/LTE 6 LTE/WCDMA 7 LTE/GSM 8 WCDMA/LTE 9 WCDMA/GSM 10GSM/LTE 11 GSM/WCDMA 12 LTE/WCDMA/GSM
<err>	error code. refer to No. 12.5 chapter

Remark

1. If the network search mode is changed, the command will take effect immediately; otherwise, the command will only take effect after the module restarts. 2. If the network search mode does not match the current configuration of the module, the command will return an error message. Example: When the network search mode is LTE only, if the module service domain is configured as CS domain only, this command returns an error message.

4.3.4. AT+QCFG="roamservice" configure roaming service

This command is used to enable or disable roaming service.

AT+QCFG="roamservice" configure roaming service	
set command	Response
AT+QCFG="roamservice"[,<roam_mode>[,<effect>]]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "roamservice",<roam_mode>,<effect>
	OK
	If optional parameters are specified, the roaming service mode is configured:
	OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	<p>This command takes effect immediately; the parameter configuration is automatically saved.</p>

parameter

<roam_mode>	Integer. Roaming service mode. 1 Disable roaming service 2 Enable roaming service 255 Auto integer. How
<effect>	the command takes effect. 0 It takes effect after the UE restarts (not supported at the moment) 1 The error code takes effect immediately. refer to
<err>	No. 12.5 chapter

4.3.5. AT+QCFG="servicedomain" configure service domain

This command is used to specify the registered service domain.

AT+QCFG="servicedomain" configure service domain	
set command	Response
AT+QCFG="servicedomain"[,<service>[,<effect>]]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "servicedomain",<service>,<effect>
	OK
	If any optional parameter is specified, configure the UE's service domain: OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<service>	Integer. The serving domain of the UE. 0 CS domain only 1 PS domain only 2 CS field and PS field coexist
<effect>	integer. How the command takes effect. 0 It takes effect after the UE restarts (not supported at the moment) 1 The error code takes effect immediately. refer to
<err>	No. 12.5 chapter

Remark

This configuration will affect the network standard supported by the module. For example: if the current network standard includes LTE network standard, when the service domain of the module is set to CS domain only, the LTE network standard will be removed; when the service domain of the module is set to "PS domain only" or "CS domain only" When "coexistence of domain and PS domain", the module will restore the LTE network standard.

4.3.6. AT+QCFCG="band" configure frequency band

This command is used to specify the frequency band that UE should search first.

AT+QCFCG="band" Configure frequency band	
set command	Response
AT+QCFCG="band" [,<bandval>,<lteban dval>]	If the optional parameter is omitted, the current configuration is queried: +QCFCG: "band",<bandval>,<ltebandval>
	OK
	If optional parameters are specified, configure the frequency band for priority search: OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<bandval> hexadecimal number. This value specifies the frequency band for GSM and WCDMA. If it is set to 0, it means that the frequency bands of GSM and WCDMA will not be changed. For example: 00000013 = 00000001 (GSM900) + 00000002 (GSM1800) + 00000010 (WCDMA 2100). 00000000

no change

00000001	GSM900
00000002	GSM1800
00000010	WCDMA 2100
00000020	WCDMA 1900
00000040	WCDMA 850
00000080	WCDMA 900

0000FFFF full frequency band

<ltebandval> hexadecimal number. This value specifies the frequency band for LTE. If it is set to 0, it means that the frequency band of LTE will not be changed. E.g:

0x15 = 0x1 (LTE B1) + 0x4 (LTE B3) + 0x10 (LTE B5). 0x1	LTE B1
(CM_BAND_PREF_LTE_EUTRAN_BAND1) 0x4	LTE B3
(CM_BAND_PREF_LTE_EUTRAN_BAND3) 0x10	LTE B5
(CM_BAND_PREF_LTE_EUTRAN_BAND5) 0x40	LTE B7
(CM_BAND_PREF_LTE_EUTRAN_BAND7) 0x80	LTE B8
(CM_BAND_PREF_LTE_EUTRAN_BAND8)	LTE B34
0x20000000(CM_BAND_PREF_LTE_EUTRAN_BAND34)	

0x2000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND38) 0x4000000000	LTE B38
(CM_BAND_PREF_LTE_EUTRAN_BAND39) 0x8000000000	LTE B39
(CM_BAND_PREF_LTE_EUTRAN_BAND40) 0x100000000000	LTE B40
(CM_BAND_PREF_LTE_EUTRAN_BAND41) 0x80000000000000000000	LTE B41
(CM_BAND_PREF_LTE_EUTRAN_BAND72) LTE B72 0x7FFFFFFFFFFFFF (CM_BAND_PREF_ANY) yyyy refer to	full band

<err>

No. 12.5 chapter

Remark

If the module does not support the currently set frequency band, the command returns an error message.

4.3.7. AT+QCFG="urc/ri/other" set the RI behavior when other URC reports

This command is used to set the RI (Ring Indicator) behavior when other URCs report.

AT+QCFG="urc/ri/other" set the RI behavior when other URC reports

set command

AT+QCFG="urc/ri/

other"[,<typeRI>[,<pulse_duration>[,<pulse_count>]]]QCFG:"urc/ri/other",<typeRI>,<pulse_duration>,<pulse_count>

OK

If any optional parameter is specified, configure the RI behavior when other URCs are reported:

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

maximum response time

300 milliseconds

Feature Description

This command takes effect immediately;

the parameter configuration is automatically saved.

parameter

<typeRI>

String type. RI behavior when URC is reported.

pulse, pulse width specified by RI send duration off

only when <typeRI> is configurable pulse duration range is 5~2000μs, valid value

	120; unit: millisecond.
<pulse_count>	Integer. number of pulses. Valid only when <typeRI> is configured as "pulse". The time interval between two adjacent pulses is <pulse_duration>. Range: 1~5; Default value: 1; Unit: second. error code. Refer to
<err>	12.5 No. chapter*

4.3.8. AT+QCFG="urcdelay" set URC delay time

This command is used to set the URC delay time from the start of RI pulse.

AT+QCFG="urcdelay" Set URC delay time setting

command	Response
AT+QCFG="urcdelay"[,<time>]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "urcdelay",<time> OK If an optional parameter is specified, sets the URC output time: OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<time>	Integer. URC delay time from the start of the RI pulse. Range: 0~120; unit: second. 0 No delayed error code. refer to
<err>	No. 12.5 chapter*

4.3.9. AT+QCFG="urc/cache" open/close URC cache

This command is used to enable or disable the URC cache function.

AT+QCFG="urc/cache" open/close URC cache

set command	Response
AT+QCFG="urc/cache"[,<enable>]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "urc/cache",<enable>

	OK
If an optional parameter is specified, the URC cache function is turned on or off:	
	OK
or	
	ERROR
If the error is related to ME functionality: +CME ERROR: <err>	
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<enable> Integer. 0

close URC cache 1
open URC cache **<err>**

error code. refer to

No. **12.5** chapter

example

```

AT+QCFG="urc/cache"
+QCFG: "urc/cache",0           //URC cache function off

OK

AT+QCFG="urc/cache",1 //Open URC cache
OK

AT+QCFG="urc/cache"
+QCFG: "urc/cache",1

OK

//Call and send 2 messages to the module

AT+QCFG="urc/cache",0 //Close URC cache
OK

RING                         //Output cached URC

NO CARRIER                   //Output cached URC

+CMTI: "ME",0                //Output cached URC

```

+CMTI: "ME",1	//Output cached URC
AT+QCFG="urc/cache"	
+QCFG: "urc/cache",0	//URC cache function off
OK	

Remark

EC200A series modules do not support this command.

4.3.10. AT+QCFG="usbnet" configure network card interface

This command is used to configure the interface of the network card.

AT+QCFG="usbnet" Configure network card interface	
set command	Response
AT+QCFG="usbnet"[,<net>]	If the optional parameter is omitted, the current configuration is queried: +QCFG: "usbnet",<net>
	OK
	If optional parameters are specified, configure the interface of the network card: OK or ERROR
	If the error is related to ME functionality: +CME ERROR:<err>
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting: the parameter configuration is automatically saved.

parameter

<net> Integer. The protocol used by the network interface.

- 1 ECM interface protocol
- 3 RNIDS interface

protocol **<err>** error code. refer to No. **12.5** chapter

4.3.11. AT+QCFG="ppp/termframe" enable/disable PPP TERM frame sending function

This command is used to enable or disable the PPP TERM frame sending function when the module hangs up PPP by itself.

AT+QCFG="ppp/termframe" enable/disable PPP TERM frame sending function

set command

AT+QCFG="ppp/termframe"[,<flag>]

Response

If the optional parameter is omitted, the current configuration is queried:

+QCFG: "ppp/termframe",<flag>**OK**

If an optional parameter is specified, enable or disable PPP TERM frame sending function:

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR:<err>

maximum response time

300 milliseconds

Feature Description

This command takes effect after restarting; the parameter configuration is automatically saved.

parameter

<flag> Integer. Enable or disable the PPP TERM frame sending function when the module hangs up PPP

by itself. 0 disables 1 enables **<err>** error codes. refer to

No. 12.5 chapter

Remark

If the PPP with TERM frame is hung up by AT+QPPPDROP , no matter **<flag>** is set to 0 or 1, the module will send TERM frame to MCU.

example

```
AT+QCFG="ppp/termframe",1
OK
AT+QCFG="ppp/termframe"
+QCFG: "ppp/termframe",1
```

OK

4.3.12. AT+QCFG="airplanecontrol" enable/disable control airplane mode via W_DISABLE#

This command is used to enable or disable the airplane mode controlled by W_DISABLE#.

AT+QCFG="airplanecontrol" enable/disable control airplane mode setting command via W_DISABLE#

AT+QCFG="airplanecontrol"[,<enable>]	Response If the optional parameter is omitted, the current configuration is queried: +QCFG: "airplanecontrol",<enable>,<status>
	OK If optional parameters are specified, configure whether to enable flight mode control via the W_DISABLE# pin: OK
	or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>

maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<enable> Integer. Enable or disable airplane mode via W_DISABLE# pin control.

0 Disable flight mode control via W_DISABLE# pin 1 Enable
flight mode control via W_DISABLE# pin. When the W_DISABLE# pin is active, the module enters the flight mode; when the W_DISABLE# pin is inactive, the module exits the flight mode. When the W_DISABLE# pin is active, it is forbidden to make the module exit the flight mode through AT+CFUN=1. When the W_DISABLE# pin status changes, it will report URC **+QIND: airplanestatus,<status> <status>** integer.

0 Exit airplane mode 1

Enter airplane mode

<err> error code. refer to

No. **12.5** chapter

Remark

1. The W_DISABLE# pin is pulled high by default, and can be activated by pulling the level low. 2. For more information about the W_DISABLE# pin, refer to the hardware design of the corresponding module.

example

```
AT+QCFG="airplanecontrol"
+QCFG: "airplanecontrol",0,0 //Disable control of airplane mode via W_DISABLE# pin
OK

//Activate the W_DISABLE# pin
AT+QCFG="airplanecontrol",1 //Enable flight mode control via W_DISABLE#pin
OK

+QIND: airplanestatus,1           //Enter flight mode due to W_DISABLE# pin activated
AT+CFUN?
+CFUN: 4                         // in airplane mode

OK

//Deactivate W_DISABLE#pin
+QIND: airplanestatus,0 AT+CFUN?      //Exit airplane mode

+CFUN: 1                         // in normal mode

OK

//restart the modem
AT+QCFG="airplanecontrol"
+QCFG: "airplanecontrol",1,0 //The setting will take effect after reboot
OK

//Activate W_DISABLE#pin
+QIND: airplanestatus,1           // enter flight mode
AT+CFUN?
+CFUN: 4                         // in airplane mode

OK
```

4.3.13. AT+QCFG="urc/ri/ring" set the RI behavior when URC reporting of incoming calls

This command is used to set the behavior of RI (Ring Indicator) when the incoming call URC is reported.

AT+QCFG="urc/ri/ring" Set the RI behavior setting command when the incoming call URC is	
reported	Response If the optional parameter is omitted, the current configuration is queried: +QCFG:"urc/ri/ring",<typeRI>,<pulse_duration>[,<pulse_count>]]
	OK If any optional parameter is specified, set the RI behavior when reporting incoming call URC: OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<typeRI>	Integer. RI behavior when reporting incoming "off" URC. No change, RI remains <pulse_duration> pulse duration. Valid only when <typeRI> is set to "pulse". If this parameter is not required, it can be set to empty. Range: 5~2000; Default value: 120; Unit: millisecond.
<pulse_count>	integer. number of pulses. Valid only when <typeRI> is set to "pulse". The time between two adjacent pulses The interval is <pulse_duration>. Range: 1~5; Default value:
<err>	1. error code. refer No. 12.5 chapter

4.3.14. AT+QCFG="risignaltype" RI signal output carrier

This command is used to specify the RI (Ring Indicator) signal output carrier.

AT+QCFG="risignaltype" RI signal output carrier setting command

	Response
AT+QCFG="risignaltype",<RI_signal_type>	If the optional parameter is omitted, the current configuration is queried: +QCFG: "risignaltype",<RI_signal_type>
	OK
	If optional parameters are specified, configure the RI signal output carrier: OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<RI_signal_type> String type. RI signal output carrier. "respective" ringing

indicator output port. For example: if the UART port

is currently used, the RI pin will generate a ringing transition at the same time; if other USB ports are used, the RI pin will not have an actual level change; if URC is output on a USB AT port that does not support ringing indication, Then there is no ringing indication.

AT+QURCCFG="urcport" can get the output port "physical" that displays

URC. No matter which port reports URC, the RI pin will have a ringing jump error code. Refer to **12.5**

<err>

No. chapter

example

```
AT+QCFG="risignaltype"
+QCFG: "risignaltype","respective"

OK
AT+QCFG="risignaltype","physical"
OK
AT+QCFG="risignaltype"
+QCFG: "risignaltype","physical"
```

OK**4.3.15. AT+QCFG="uart2ipr" configure baud rate**

This command is used to configure the baud rate of UART2.

AT+QCFG="uart2ipr" configure baud rate

set command

Response

AT+QCFG="uart2ipr"[,<ipr>]

If the optional parameter is omitted, the current configuration is queried:

+QCFG: "uart2ipr",<ipr>**OK**

If optional parameters are specified, configure the baud rate of UART2:

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

maximum response time

300 milliseconds

Feature Description

This command takes effect after restarting; the
parameter configuration is automatically saved.

parameter

<ipr> Integer. Baud rate for UART2.

4800
9600
19200
38400
57600
115200
230400
460800
921600

<err> Error code. refer to No. **12.5** chapter

4.3.16. AT+QCFCG="nat" configure network card working mode

This command is used to configure the working mode of the network card.

AT+QCFCG="nat" configure network card working mode	
set command	Response
AT+QCFCG="nat"[,<nat>]	If the optional parameter is omitted, the current configuration is queried: +QCFCG: "nat",<nat>
	OK
	If optional parameters are specified, configure the working mode of the network card: OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.

parameter

<nat> integer. The working mode of the
network card. 0 routing mode 1
network card mode **<err>** error
code. refer to **No. 12.5** chapter

example

```
AT+QCFCG="nat",1 //Configure the current network card working mode as network card mode
OK
```

4.4. AT+QINDCFG control URC reporting

This command is used to control URC reporting.

AT+QINDCFG control URC reporting	
Test	response
command AT+QINDCFG=?	+QINDCFG: (list of supported <urctype>), (list of supported <enable>), (list of supported <savetonvram>)
	OK
set command	Response
AT+QINDCFG=<urctype>[,<enable>[,<savetonvram>]]	If the optional parameter is omitted, the current configuration is queried: +QINDCFG: <urctype>,<enable>
	OK
	If optional parameters are specified, configure URC reporting: OK
	or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; whether the parameter configuration is saved depends on <savetonvram>.

parameter

<urctype> integer. URC type. Whether to

strength and channel bit report ability phar of URC. By default, it's similar

"csq" to AT+CSQ). Disabled by default. If configured as open, URC will be reported: **+QIND:**

"csq"<rssl>,<ber>

"datastatus" Data service status indication. Disabled by default. If configured to open, URC will be reported:

+QIND: "datastatus",<suspended>,<reason> <reason> is an

integer. The values are as follows: 0 SUSPEND_NO_CAUSE 1

SUSPEND_BY_RAU_ATTACH 2 SUSPEND_BY_LAU 3

SUSPEND_BY_TAU 4 SUSPEND_BY_CS_SERVICE 5

SUSPEND_BY_DS_OPERATION

6 SUSPEND_BY_POWERUP Network main mode and sub mode indication. Disabled by default. If configured as open, URC will be reported: **^MODE:<main_mode>,<sub_mode>** <main_mode> is an integer. The values are as follows: 0 SYSINFO_SYSTEMO_MODE_NO_SERVICE 1 SYSINFO_SYSTEMO_MODE_RESERVED_1 2 SYSINFO_SYSTEMO_MODE_RESERVED_2 3 SYSINFO_SYSTEMO_MODE_GSM_GPRS 5 SYSINFO_SYSTEMO_MODE_GSM_GPRS 5 SYSINFO_SYSTEMO_MODE_WCDMA 17 SYSINFO_SYSTEMO_MODE_WCDMA 17 SYSINFO_SYSTEMO_MODE_GSM_GPRSÿÿÿÿ 0 SYSINFO_SYSTEMO_SUBMODE_NO_SERVICE 1 SYSINFO_SYSTEMO_SUBMODE_GSM 3 SYSINFO_SYSTEMO_SUBMODE_GSM_EGPRS 5 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSDPA 6 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSUPA 7 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSPA 8 SYSINFO_SYSTEMO_SUBMODE_UTRAN 17 SYSINFO_SYSTEMO_SUBMODE_EUTRAN ÿÿÿÿÿÿÿÿ Disabled by default. If configured to open, URC will be reported: **+QIND: "smsfull",<storage>**

"smsfull"

"smsincoming" New message indication. Open by default. The relevant URCs are: **+CMTI, +CMT, +CDS**

"act" Network format changes. Disabled by default. If configured to open, URC will be reported: **+QIND: "act",<actvalue>** <actvalue> is a string type. The values are as follows:

- "GSM"
- "EGPRS"
- "WCDMA"
- "HSDPA"
- "HSUPA"
- "HSDPA&HSUPA"
- "LTE"
- "UNKNOWN"

An example of a URC

is as follows: **+QIND: "act","HSDPA&HSUPA"**

+QIND: "act","UNKNOWN" The

description of "act" is as follows: 1. If

the module is not registered with the network, <actvalue> is "UNKNOWN".

2. If enabled, the URC of "act" will be reported immediately. Only when the network standard

A new URC will only be reported when there is

a change. Reference signal received power, reference received quality and signal to interference plus noise ratio change indicator (default off). If configured to open, URC will be reported: **+QIND:**

"SQI",<RSRP>,<RSRQ>,<SINR>

<RSRP> integer. Reference signal received power. Unit: dBm. (refer to 3GPP 36.214)

Chapter 5.1.1)

<RSRQ> integer. Refer to reception quality. Unit: dB.

(Refer to Chapter 5.1.3 of 3GPP 36.214)

<SINR> Integer. Signal-to-interference-plus-noise ratio. Range: -20~30; Unit: dB.

"phonebook" incoming phonebook indication (on by default). The relevant URC is: +QIND: PB DONE

"nocarrier" Incoming call opening indication (open by default). The relevant URC is: +QIND: NO CARRIER"

<enable> Integer. Enable/disable the reporting of the specified

URC. 0 off 1 on <savetonvram> integer.

Whether to save parameter configuration to

NVM. Do not save save 1 error code. refer to

0

<err>

No. 12.5 chapter

5 (U)SIM card related commands

5.1. AT+CIMI query IMSI

This command is used to query the International Mobile Subscriber Identity (IMSI) of the (U)SIM. The IMSI allows the TE to identify the (U)SIM in the MT or the active application in the UICC (GSM or (U)SIM).

AT+CIMI query IMSI	
test command	response
AT+CIMI=?	OK
Excuting an order	response
AT+CIMI	<IMSI>
	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
Refer to 3GPP TS 27.007	

parameter

<IMSI> String type. International Mobile Subscriber Identity (string without double quotes). **<err>** Error

code. refer to No. **12.5** chapter

example

AT+CIMI

460023210226023

//Query the IMSI of the (U)SIM card in ME

OK

5.2. AT+CLCK function lock

This command is used to lock, unlock MT or network functions, and query the locking status. This command can be aborted while setting or querying network capabilities. This command generally requires a password. When querying the network service status (<mode> is 2), if all the service statuses of the <class> type are inactive, the command response line should return inactive. The default key for PF, PN, PU, PP and PC locks is "12341234".

AT+CLCK function lock

test command	response
AT+CLCK=?	+CLCK: (list of supported <fac>s)
	OK
set command	Response
AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]	when <mode> is not equal to 2 and the command is executed successfully: OK When <mode> is equal to 2 and the command is executed successfully: +CLCK: <status>[,<class>] [+CLCK: <status>[,<class>]] [...] OK If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	5 seconds
Feature Description	/
Refer	
to 3GPP TS 27.007	

parameter

<fac> String type.

"SC" (U)SIM (locks the currently selected (U)SIM/UICC card in the card slot). (U)SIM/UICC is powered on in MT and

A password is required to execute the lock command

"AO" BAOC (forbid all outgoing calls, refer to 3GPP TS 22.088 clause 1 for details) "OI" BOIC (forbid all international outgoing calls, refer to 3GPP TS 22.088 clause 1 for details) "OX" BOIC-exHC (forbid all International calls, except home country, for details, refer to 3GPP TS 22.088 clause 1) "AI"

BAIC (forbid all incoming calls, refer to 3GPP TS 22.088 for details clause 2) "IR" BIC-Roam (forbid all incoming calls when roaming outside the home area, refer to 3GPP TS 22.088 for details clause 2)

"AB" Forbid all services (refer to 3GPP TS 22.030 for details), only valid when <mode>=0 "AG" Forbid outgoing services (refer to 3GPP TS 22.030 for details), only valid when <mode>=0 "AC" Prohibit incoming calls (refer to 3GPP TS 22.030 for details), only valid when <mode>=0 "FD" (U)SIM in UICC (GSM or (U)SIM) fixed dialing memory function card or activity app (if

PIN2 has not completed the authentication in the current session, you need to enter PIN2 in <passwd>)

"PF" locks the phone to the first inserted (U)SIM/UICC card (also called PH-FSIM in this document) (when inserted

For other (U)SIM/UICC cards, MT requires a password)

"PN" Network Personalization (refer to 3GPP TS 22.022 for details)

"PU" Network Subset Personalization (refer to 3GPP TS 22.022 for details)

"PP" Service Provider Personalization (refer to 3GPP TS 22.022 for details)

"PC" Enterprise Personalization (Refer to 3GPP TS 22.022 for details)

<mode> integer. operating mode. 0

unlocked 1 locked 2

query status

<passwd> string type.

password. <class> Integer. data category.

1 voice 2 data 4 fax 7 all telephone

communication except

short message 8 short

message 16 data line

synchronous 32 data line asynchronous

<status> integer. device status.

0 unlocked locked

1 <err>

error code. refer to

No. 12.5 chapter

example

```
AT+CLCK="SC",2 //Query (U)SIM card status
+CLCK: 0 // (U)SIM card is not locked

OK

AT+CLCK="SC",1,"1234" //Lock the U(SIM) card, and the password is "1234"
OK

AT+CLCK="SC",2 //Query (U)SIM card status
+CLCK: 1 // (U)SIM card is locked

OK

AT+CLCK="SC",0,"1234" //Unlock (U)SIM card
OK
```

5.3. AT+CPIN PIN Management

This command is used to enter a password or query whether the module needs to enter a password before operation. The password can be (U)SIM PIN, (U)SIM PUK, PH-SIM PIN etc. If the PIN is to be entered twice, the TA will automatically re-enter the PIN. If no PIN request is pending, no action will be taken and +CME ERROR will be returned to the TE.

If the type of MT PIN is (U)SIM PUK or (U)SIM PUK2, you need to enter the second parameter <new_pin>, which is used to replace the old PIN code in (U)SIM.

AT+CPIN PIN management	
test command	response
AT+CPIN=?	OK
query command	The
AT+CPIN?	response TA returns in alphanumeric format indicating whether a password is required. +CPIN: <code>
	OK
set command	response
AT+CPIN=<pin>[,<newpin>]	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	5 seconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<code> String type.

READY	No password waiting to enter MT
SIM PIN	MT is waiting to enter (U)SIM PIN
SIM PUK	MT is waiting for input of (U)SIM PUK
SIM PIN2	MT is waiting to enter (U)SIM PIN2
SIM PUK2	MT is waiting for input (U)SIM PUK2
PH-NET PIN	MT is waiting for network personalization code to be entered
PH-NET PUK	MT is waiting for the Network Personalization Unlock Code to be entered
PH-NETSUB PIN	MT is waiting for the network subset personalization code to be entered
PH-NETSUB PUK	MT is waiting for the Network Subset Personalized Unlock Code to be entered
PH-SP PIN	MT is waiting for the service provider's personalized code
PH-SP PUK	MT is waiting for the service provider's personalized unlock code to be entered

PH-CORP PIN	MT is waiting for the enterprise personalization code to be entered
PH-CORP PUK	MT is waiting for Enterprise Personalization Unlock
<pin>	Password String type. password. If the requested password type is PUK, such as (U)SIM PUK1, PH-FSIM PUK or other passwords, you must enter <newpin>. <newpin> String type. new password. If the requested password type is PUK, you need to re-enter the new password. error code. refer to
<err>	No. 12.5 chapter

example

```
//Enter PIN
AT+CPIN?
+CPIN: SIM PIN //Waiting to enter the (U)SIM PIN code

OK
AT+CPIN=1234 //Enter PIN code
OK

+CPIN: READY
AT+CPIN? //PIN code entered
+CPIN: READY

OK
//Enter PUK and PIN
AT+CPIN?
+CPIN: SIM PUK //Waiting for input of (U)SIM PUK code

OK
AT+CPIN="26601934","1234" //Enter PUK code and new password
OK

+CPIN: READY
AT+CPIN?
+CPIN: READY //The PUK code has been entered

OK
```

5.4. AT+CPWD Change Password

This command is used to modify the function lock password defined by **AT+CLCK**. The test command returns two parameters listing the available features and the maximum length of the password.

AT+CPWD Change password

test command AT+CPWD=?	response +CPWD: (list of supported <fac>s), <pwdlength> OK
set command AT+CPWD=<fac>,<oldpwd>,<newpwd>	response OK If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	5 seconds
Feature Description	/
refer to 3GPP TS 27.007	

ginseng

number

<fac> String type.
 "SC" (U)SIM (locks the currently selected (U)SIM/UICC card in the card slot). (U)SIM/UICC requires a password when the MT is powered on and executes the lock command
 "AO" BAOC (forbid all outgoing calls, refer to 3GPP TS 22.088 clause 1 for details) "OI" BOIC
 (forbid all international outgoing calls, refer to 3GPP TS 22.088 clause 1 for details) "OX" BOIC-exHC (forbid all international calls Outgoing, except home country, refer to 3GPP TS 22.088 for details clause 1)
 "AI" BAIC (forbid all incoming calls, refer to 3GPP TS 22.088 clause 2 for details) "IR" BIC-Roam (forbid all incoming calls when roaming outside the home area, refer to 3GPP TS 22.088 for details clause 2)
 "AB" Forbid all services (refer to 3GPP TS 22.030 for details), only valid when <mode>=0 "AG" Forbid outgoing services (refer to 3GPP TS 22.030 for details), only valid when <mode>=0 "AC" prohibits incoming calls (refer to 3GPP TS 22.030 for details), only valid when <mode>=0
 "P2" (U)SIM PIN2

<pwdlength> integer. Password maximum length.**<oldpwd>** String type. Password specified from the user interface or using this command.**<newpwd>** String type. new password. error code. Refer to **12.5****<err>** No. chapter

example

```
AT+CPIN?
+CPIN: READY

OK
```

```

AT+CPWD="SC","1234","4321" //Modify (U)SIM card password to "4321"
OK

//Restart the module or reactivate the (U)SIM card
AT+CPIN? //Query PIN code is locked
+CPIN: SIM PIN

OK
AT+CPIN="4321" //PIN must be entered to define a new password "4321"
OK

+CPIN: READY

```

5.5. AT+CSIM universal (U)SIM card access

This command allows direct control of the (U)SIM card installed in the currently selected card slot from the remote application on the TE. And TE should be in Intra-processing of (U)SIM information as specified by GSM/UMTS.

AT+CSIM Universal (U)SIM card access	
Test	response
command AT+CSIM=?	OK
set command	response
AT+CSIM=<length>,<command>	+CSIM: <length>,<response>
	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<length> <command> The parameter length of the command and <response> string.

3GPP TS 51.011.

<response> The response sent by the (U)SIM card to the MT, the format refers to 3GPP TS 51.011.

<err> error code. refer to No. 12.5 chapter

5.6. AT+CRSM (U)SIM restricted access

This command allows simple and limited access to the (U)SIM database for transferring the (U)SIM command number to the MT (**<command>**) and its required parameters.

AT+CRSM (U)SIM card restricted access test command	
AT+CRSM=?	response OK
set command	response +CRSM: <sw1>,<sw2>[,<response>]
AT+CRSM=<command>[,<fileId>[,<P1>,<P2>,<P3>[,<data>][,<pathId>]]]	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<command>	Integer. (U)SIM command number. 176 READ BINARY (read binary file) 178 (read record content) GET RESPONSE (get 192 response) 214 UPDATE BINARY (update binary file) 220 (status query) integer . For <command> , it is the 242 identifier of the basic data file on the (U)SIM. Integer.
<fileId>	Parameters transmitted by MT to the (U)SIM. All commands except GET RESPONSE and STATUS
<P1>, <P2>, <P3>	need to include this parameter. Parameter values refer to 3GPP TS 51.011. Hexadecimal character format. Information to be written to the (U)SIM card. For details, refer to AT+CSCS . Hexadecimal character format.
<data>	Basic file path in UICC. Integer. (U)SIM Information about actual command execution. These parameters are passed to TE when the command succeeds or fails. Hexadecimal string format. The response after the
<pathId>	command is sent successfully. For details, refer to AT+CSCS. STATUS and GET RESPONSE return information about the current basic data fields, the information includes file type and its size, refer to 3GPP
<sw1>, <sw2>	TS 51.011. After a READ BINARY, READ RECORD, or RETRIEVE ODATA command, the requested data is returned. No <response> is returned after a successful UPDATE BINARY, UPDATE RECORD, or SET DATA command.
<response>	

<err> error code. refer toNo. [12.5 chapter](#)

5.7. AT+QCCID query ICCID

This command is used to query the integrated circuit card identification code (ICCID) of the (U)SIM card.

AT+QCCID query ICCID

test command	response
AT+QCCID=?	OK
Excuting an order	response
AT+QCCID	+QCCID: <ICCID>
	OK
	or
	ERROR
maximum response time	300 milliseconds
Feature Description	/

parameter

<ICCID> integer. The IC card identification number of the (U)SIM card.

example

```
AT+QCCID //Query the ICCID of the (U)SIM card
+QCCID: 89860025128306012474

OK
```

5.8. AT+QPINC get PIN remaining retry times

This command is used to query the number of remaining input (U)SIM PIN/PUK passwords.

AT+QPINC Get PIN remaining retry times

test command	response
AT+QPINC=?	+QPINC: (list of supported <facility>s)

	OK
query command AT+QPINC?	response +QPINC: "SC",<PIN_counter>,<PUK_counter> +QPINC: "P2",<PIN_counter>,<PUK_counter>
	OK
set command AT+QPINC=<facility>	response +QPINC: <facility>,<PIN_counter>,<PUK_counter>
	OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/

parameter

<facility> String type.
 "SC" (U)SIM PIN "P2"
 (U)SIM PIN2

<PIN_counter> integer. The remaining number of times to enter the PIN code. Range: 0~3.

<PUK_counter> integer. The remaining number of times to enter the PUK password. Range: 0~10.

<err> error code. refer toNo. **12.5** chapter

5.9. AT+QINISTAT query (U)SIM card initialization status

This command is used to query the initialization status of (U)SIM card.

AT+QINISTAT query (U)SIM card initialization status	
Test	response
command AT+QINISTAT=?	+QINISTAT: (supported <status> range)
	OK
Excuting an order	response
AT+QINISTAT	+QINISTAT: <status>
	OK

maximum response time	300 milliseconds
Feature Description	/

parameter

<status> integer. (U)SIM card initialization status. The actual value is the sum of any number of the following four numbers (for example: 7 = 1 + 2 + 4 means CPIN READY + SMS DONE + PB DONE, that is, CPIN is ready, SMS initialization is complete and phonebook initialization is complete).

0 initial state

initialization 0 CPIN ready PB ready Phonebook initialized & both completed 2 SMS

5.10. AT+QSIMDET (U)SIM card detection

This command is used to enable the hot swap function of (U)SIM card. GPIO interrupt is used to detect (U)SIM card, it needs to be set when inserting (U)SIM card (U)SIM card detection pin level.

AT+ QSIMDET (U)SIM card detection test command	
AT+QSIMDET=?	response +QSIMDET: (supported <enable> list), (supported <insert_level> list) OK
query command AT+QSIMDET?	response +QSIMDET: <enable>,<insert_level> OK
set command AT+QSIMDET=<enable>,<insertlevel>	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.

parameter

<enable>	Integer. Enable/disable (U)SIM card detection function. 0 disable 1 enable integer. When a (U)SIM card is inserted, the level detected by the pin. 0
<insert_level>	low level 1 high level

Remark

If the configured <insert_level> value is inconsistent with the hardware design, the hot swap function will be invalid.

example

AT+QSIMDET=1,0	//When the (U)SIM card is inserted, the (U)SIM detection pin level is set to low level
OK	
<Remove (U)SIM card>	
+CPIN: NOT READY	
<Insert (U)SIM card>	
+CPIN: READY	//CPIN is ready

5.11. AT+QSIMSTAT (U)SIM card insertion and removal status reporting

This command is used to query/enable/disable (U)SIM card insertion and removal status reporting function.

AT+QSIMSTAT (U) SIM card insertion and removal status reporting test command

AT+QSIMSTAT=?	query command	response
		+QSIMSTAT: (list of supported <enable>s)
		OK
AT+QSIMSTAT?	query command	response
		+QSIMSTAT: <enable>,<inserted_status>
		OK
AT+QSIMSTAT=<enable>	set command	response
		OK
		or
		ERROR
maximum response time	300 milliseconds	

Feature Description

This command takes effect after restarting; the parameter configuration is automatically saved.

parameter

<enable>

Integer. Enable/disable (U)SIM card insertion and removal status reporting function. When enabled, URC **+QSIMSTAT**:

<enable>,<inserted_status> will be reported to indicate the status of (U)SIM card insertion and removal. 0 disable 1 enable

—

<inserted_status> integer. (U)SIM card insertion and removal status. This parameter does not allow configuration.

0 Unplugged

1 Plugged 2

Unknown status. This state occurs before (U)SIM card initialization

example

```
AT+QSIMSTAT?          //Query the status of (U)SIM card plugging and unplugging
+QSIMSTAT: 0,1

OK
AT+QSIMDET=1,0
OK
AT+QSIMSTAT=1          //Enable (U)SIM card insertion and removal status report function
OK
AT+QSIMSTAT?
+QSIMSTAT: 1,1

OK
<Remove (U)SIM card>
+QSIMSTAT : 1,0          //Report the plug status of the (U)SIM card: pull out

+CPIN: NOT READY
AT+QSIMSTAT?
+QSIMSTAT: 1,0

OK
<Insert (U)SIM card>
+QSIMSTAT: 1,1          //Report the plug status of the (U)SIM card: plug in

+CPIN: READY
```

6 Network service commands

6.1. AT+COPS select operator

This command is used to query the current operator and its status, and allows to set automatic or manual network selection.

The test command returns five parameters, representing the operators present in the network. If any parameter is unavailable, the corresponding value is an empty field. The display order of the returned operator list is: home network, (U)SIM recommended network and other networks.

The query command returns the current network search mode and the currently selected operator. If no operator is selected, <format>, <oper> and <AcT> are not returned.

The set command is used to force the selection and registration of a GSM/UMTS/LTE network operator, even if the selected network operator is not available. Select any other carrier (except <mode>=4). The format of the selected carrier name should also apply to the query command **AT+COPS?**.

AT+COPS select operator

Test command

AT+COPS=?

response

+COPS: [list of supported operators (<stat>, long character <oper>, short character <oper>, number <oper>[,<AcT>])][,(supported <mode> range), (supported <format> range)]

OK

If the error is related to ME functionality:

+CME ERROR: <err>

query command

AT+COPS?

response

+COPS: <mode>[,<format>[,<oper>][,<AcT>]]

OK

If the error is related to ME functionality:

+CME ERROR: <err>

set command

AT+COPS=<mode>[,<format>[,<oper>][,<AcT>]]]

response

OK

If the error is related to ME functionality:

	+CME ERROR: <err>
maximum response time	180 seconds, depending on network status
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<stat> integer. Carrier status. 0 Unknown

- 1 Available operator
- 2 Currently selected operator
- 3 Forbidden selected operator

<oper> string type. operator. **<format>** indicates the format of the string. **<mode>** integer.

Network selection mode. Search the network automatically, omit **<oper>** and manually search the

- 0 network, **<oper>** cannot be omitted and **<AcT>** is optional
- 1
- 2 Log off the network manually
- 3 Only set **<format>** (for query command AT+COPS?); do not register or logout (omit **<oper>** and **<AcT>**); this value is not applicable to query command return results 4 manual and automatic search Combination mode, the **<oper>** field cannot be omitted. If the manual selection fails, it will enter the automatic selection mode (**<mode>=0**) **<format>** integer. The format of **<oper>**.

- 0 Long string format, up to 16 characters 1 Short string format 2 Numeric format, GSM location area identification number

<AcT> integer. Network format. The values 3, 4, 5 and 6 are only applicable to the query command return result when the MS is in the data service state, and cannot be used for the setting command.

- 0 GSM
- 2 UTRAN
- 3 GSM W/EGPRS
- 4 UTRAN w/HSDPA
- 5 UTRAN W/HSUPA
- 6 UTRAN W/HSDPA and HSUPA
- 7 E-UTRAN
- 8 UTRAN HSPA+

<err> Error code. refer to

No. **12.5** chapter

example

AT+COPS=?

//List all current network operators

```
+COPS: (1,"CHN-UNICOM","UNICOM","46001",2),(1,"CHN-UNICOM","UNICOM","46001",0),(2,"CHN-UNICOM","UNICOM","46001",7),(1,"CHN-CT","CT","46011",7),(3,"CHINA MOBILE","CMCC","46
```

```
000",0),(0,1,2,3,4),(0,1,2)
OK
AT+COPS? //Query the currently selected network operator
+COPS: 0,0,"CHN-UNICOM",7
OK
```

6.2. AT+CREG CS domain network registration status

The query command returns the CS domain network registration status and result code display status. <stat> indicates the network registration status of ME. Only if ME is registered
The location information <lac> and <ci> will be returned only when the network and <n>=2 .

The setting command sets whether to report URC and controls whether to display URC +CREG when <n>=1 and the ME network registration status changes :
<stat>.

AT+CREG CS domain network registration status	
test command	response
AT+CREG=?	+CREG: (supported <n> ranges)
	OK
query command	response
AT+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]]
	OK
	If the error is related to ME functionality: +CME ERROR: <err>
set command	response
AT+CREG[=<n>]	OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; AT&W needs to be executed to save the parameter configuration
Refer	
to 3GPP TS 27.007	

parameter

<n> Integer. Whether to enable network registration related
URC. 0 Disable web registration URC

1 Enable network registration URC **+CREG: <stat>** 2

Enable network registration URC with location information:

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

integer. registration status.

0 Unregistered; ME is not currently searching for an operator

to register 1 Registered, home network 2 Unregistered, ME

is searching for an operator to register 3 Registration rejected

4 Unknown status 5 Registered, roaming network **<lac>** string type. Location area number. 2 bytes (in hexadecimal format).

String type. Cell ID. 16-bit (GSM) or 28-bit (UMTS/LTE) in

hexadecimal format.

<ci>

<AcT> integer. Network format.

0 GSM

2 UTRAN

3 GSM W/EGPRS

4 UTRAN w/HSDPA

5 UTRAN W/HSUPA

6 UTRAN W/HSDPA and HSUPA

7 E-UTRAN

8 UTRAN HSPA+ **<err>** error

code. refer to

No. 12.5 chapter*

example

AT+CREG=1

OK

+CREG: 1

//URC reports that ME has registered to the home network //

AT+CREG=2

Enable network registration URC with location information

OK

+CREG: 1,"D509","80D413D",7 //URC reports the operator with cell ID and location area code

6.3. AT+CSQ query signal strength

This command is used to query the received signal strength **<rssi>** and channel bit error rate **<ber>** of the current serving cell.

The test command returns the values supported by TA.

Execute the command to obtain the received signal strength indicator **<rssi>** and channel bit error rate **<ber>** returned by the ME .

AT+CSQ query signal strength

test command AT+CSQ=?	response +CSQ: (list of supported <rssi>), (list of supported <ber>)
	OK
Executing an order AT+CSQ	response +CSQ: <rssi>,<ber>
	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to 3GPP TS 27.007	

parameter

<rssi>	Integer. Received signal strength indicator.
0	Less than or equal to -113 dBm
1	-111 dBm
2~30	-109 ~ -53 dBm greater
31	than or equal to -51 dBm
99	unknown or unmeasurable
100	less than or equal to -116 dBm
101	-115 dBm
102~190	-114 ~ -26 dBm
191	Greater than or equal to unmeasurable 199 125 dBm Extended to TD-SCDMA to indicate Received Signal Code Power (RSCP) Integer. channel bit error rate.
<ber>	Percentage format.
0~7	RxQual values from the table in 3GPP TS 45.008 Chapter 8.2.4.
99	Unknown or untestable error code. refer to
<err>	No. 12.5 chapter

example

```
AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)
```

OK

AT+CSQ**+CSQ: 28,99**

//Query the current received signal strength is 28, the bit error rate is unknown or unmeasurable

OK

Remark

After executing network-related commands (such as **AT+CCWA** and **AT+CCFC**), it is recommended to wait 3 seconds before executing **AT+CSQ** to ensure that the network access required by the previously executed command has been completed.

6.4. AT+CPOL configuration preferred operator list

This command is used to configure or query the list of preferred operators.

AT+CPOL configuration preferred operator list	
test command	response
AT+CPOL=?	+CPOL: (supported <index> list), (supported <format> range)
	OK
query command	
AT+CPOL?	Response query for list of preferred operators: +CPOL: <index>,<format>,<oper>[,<GSM>,<GSM(compact)>,<UTRAN>,<E-UTRAN>] [+CPOL: <index>,<format>,<oper>[,<GSM>,<GSM(compact)>,<UTRAN>,<E-UTRAN>]] [...]
	OK
set command	The response configures the preferred carrier list:
AT+CPOL=<index>[,<format>[,<oper>[<GSM>,<GSM(compact)>,<UTRAN>,<E-UTRAN>]]]	OK or ERROR
	If <index> is specified but <oper> is omitted, the following parameters will be omitted.
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<index>	Integer. Sequence of (U)SIM card PLMN.
<format>	Integer. The display format of <oper>. 0 long string format 1 short string format 2 numeric format string type. <format> indicates whether the parameter format is
<oper>	a string or a number (refer to AT+COPS). Integer. Whether to choose GSM network standard. 0 not selected 1 selected <GSM(compact)> integer. Whether to choose GSM compact network standard.
<GSM>	0 Not selected 1 Integer selected. Whether to choose UTRAN network standard. 0 Not selected 1 Integer selected. Whether to select the E-UTRAN network standard. 0 not selected 1 selected

<UTRAN>**<E-UTRAN>**

—

Remark

The network standard selection parameters <GSM>, <GSM(compact)>, <UTRAN> and <E-UTRAN> are mandatory for (U)SIM cards or UICC cards with a PLMN selector for the network standard .

6.5. AT+COPN query operator name list

This command is used to query the operator name list from ME, and the command returns **string format (<alpha>)** and **number format in ME memory (<numericn>)** operator name.

AT+COPN query operator name list	
Test command AT+COPN=?	response OK
Excuting an order AT+COPN	Response +COPN: <numeric1>,<alpha1> [+COPN: <numeric2>,<alpha2> [...]] OK

	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	depends on the number of operators
Feature Description	/
Refer to 3GPP TS 27.007	

parameter

<numeric> string type. Carrier name in numeric format (refer to **AT+COPS for details**). <alphan> String type. Carriername in string format (refer to **AT+COPS for details**). error code. refer to**<err>**No. **12.5** chapter

6.6. AT+CTZU auto update time zone

This command is used to enable or disable the function of automatically updating the time zone through NITZ.

AT+CTZU Automatically update the time zone	
test command AT+CTZU=?	response +CTZU: (list of supported <onoff>s) OK
query command AT+CTZU?	response +CTZU: <onoff> OK
set command AT+CTZU=<onoff>	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.
refer to 3GPP TS 27.007	

parameter

<onoff>	Integer. Automatically update time zone mode. 0 Disable automatic time zone update via NITZ 1 Enable automatic time zone update via NITZ and update GMT time to URC 3 Enable automatic time zone update via NITZ and update local time to RTC
----------------------	---

example

AT+CTZU?**+CTZU: 1****OK****AT+CTZU=?****+CTZU: (0,1,3)****OK****AT+CTZU=0****OK****AT+CTZU?****+CTZU: 0****OK**

6.7. AT+CTZR report time zone change

This command is used to enable or disable the reporting of time zone change events. If reporting is enabled, MT will return URC **+CTZV** when the time zone changes : **<tz>** or **+CTZE: <tz>,<dst>,<time>**.

AT+CTZR report time zone change	
test command	response
AT+CTZR=?	+CTZR: (supported <reporting> range)
	OK
query command	response
AT+CTZR?	+CTZR: <reporting>
	OK
set command	response
AT+CTZR=<reporting>	OK or ERROR

	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect after restarting; the parameter configuration is automatically saved.
refer to	
3GPP TS 27.007	

parameter

<reporting> Integer. Whether to report time zone changes. 0

Do not report 1 Report time zone

change through URC **+CTZV: <tz>** 2 Report extended time

zone information and local time string type through URC +CTZE: <tz>,<dst>,<time>. Indicates the sum

<tz> of the local time zone (displaying the difference between local time and GMT time in units of 15 minutes) and daylight saving time. The format is " \pm zz", which is a fixed width of two integer numbers. Range: -48 ~ +56. To ensure a fixed width, add 0 before the numbers between -9 and +9, for example: "-09", "+00", "+09". Integer. Indicates whether daylight saving time

<dst> adjustments are included in <tz>. 0 does not include daylight saving adjustment 1 includes +1 hour (equivalent to one hour in <tz>) daylight saving adjustment 2 includes +2 hour (equivalent to two hours in <tz>) daylight saving adjustment string type .

local time. Format: "YYYY/MM/DD, hh:mm:ss", used to represent year (YYYY), month (MM), day (DD), hour (hh), minute (mm) and second (ss). The parameter value is provided by the network when the time zone information is transmitted, and is

<time> displayed in the URC extended time zone report. error code. refer to

<err>

No. 12.5 chapter

example

AT+CTZR=2

OK

AT+CTZR?**+CTZR: 2**

OK

+CTZE: "+32",0,"2017/11/04,06:51:13"

//Report the extended time zone and local time through URC

6.8. AT+QLTS Get the latest time synchronized through the network

This command is used to obtain the latest time synchronized through the network.

AT+QLTS Get the latest time synchronized through the network	
Test command AT+QLTS=?	response +QLTS: (supported <mode> range)
	OK
set command AT+QLTS=<mode>	response +QLTS: <time>,<dst>
	OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
Excuting an order AT+QLTS	response +QLTS: <time>,<dst>
	OK
maximum response time	300 milliseconds
Feature Description	/

parameter

<mode> integer. Query the network time mode. 0

Query the latest time synchronized through
the network 1 Query the current GMT time calculated from the latest time
synchronized through the network 2 Query the current local time string type

<time> calculated from the latest time synchronized through the network. The format is "yyyy/MM/dd,hh:mm:ss±zz", used to represent year (yyyy), month (MM), day (dd), hour (hh), minute (mm), second (ss) , time zone (zz, this field displays the difference between local time and GMT time in units of 15 minutes; range: -48 ~ +48). For example: May 6, 2004 22:10:00, GMT time plus 2 hours equals "2004/05/06, 22:10:00+08". summer time. **<err>** Error code. refer to

<dst>

No. 12.5 chapter

Remark

If the time is not synchronized through the network, after executing this command, a string +QLTS: "" without time will be returned .

example

```
AT+QLTS=?                                //Query the supported network time mode
+QLTS: (0-2)

OK
AT+QLTS                                //Query the latest time synchronized through the network
+QLTS: "2019/01/13,03:40:48+32,0"
OK
AT+QLTS=0                                //Query the latest time synchronized through the network, the function is consistent with the execution command AT +QLTS
+QLTS: "2019/01/13,03:40:48+32,0"

OK
AT+QLTS=1                                //Query the current GMT time calculated from the latest time synchronized by the network
+QLTS: "2019/01/13,03:41:22+32,0"

OK
AT+QLTS=2                                //Query the current local time calculated from the latest time synchronized by the network
+QLTS: "2019/01/13,11:41:23+32,0"

OK
```

6.9. AT+QNWINFO query network information

This command is used to query network information, such as the selected network standard, operator and selected frequency band.

AT+QNWINFO query network information	
test command	response
AT+QNWINFO=?	OK
Executing an order	response
AT+QNWINFO	+QNWINFO: <AcT>,<oper>,<band>,<channel>
	OK
maximum response time	300 milliseconds
Feature Description	/

parameter

<AcT>	String type. Selected network format. "NONE" "GSM"
--------------------	--

"GPRS"
 "EDGE"
 "WCDMA"
 "HSDPA"
 "HSUPA"
 "HSPA+"
 "TDD LTE"
 "FDD LTE"

<opers> String type. Carrier name in numeric format.

<band> String type. Selected frequency band.

"GSM 1800"
 "GSM 900"
 "WCDMA 2100"
 "WCDMA 850"
 "WCDMA 900"
 "LTE BAND 1"
 "LTE BAND 3"
 "LTE BAND 5"
 "LTE BAND 7"
 "LTE BAND 8"
 "LTE BAND 20"
 "LTE BAND 28"
 "LTE BAND 34"
 "LTE BAND 38"
 "LTE BAND 39"
 "LTE BAND 40"
 "LTE BAND 41"

<channel> integer. channel ID.

example

```
AT+QNWINFO=?  

OK  

AT+QNWINFO  

+QNWINFO: "FDD LTE",46001,"LTE BAND 3",1650  

OK
```

7 Call related commands

7.1. ATA call response

This command is used to connect the module to answer voice call or data call indicated by URC **RING**. After executing this command, MT sends an off-hook signal to the remote station.

ATA call answer

Executing an order

ATA

Response

If the data is dialed and the connection is successfully established:

CONNECT <text>

At this time, TA switches to data mode

only when **<value>** set by **ATX<value>** is greater than 0, return

CONNECT <text>.

TA switches to command mode and calls release:

OK

If the voice dials and the connection is successfully established:

OK

If the connection cannot be established:

NO CARRIER

maximum response time

90 seconds, depending on network status

Feature Description

/

refer to

V.25ter

Remark

1. ATA operation ignores other commands in the same command line.
2. If a character is received during ATA execution , the command may be terminated. However, in certain states of connection establishment (such as: handshake state), the execution of this command will not be suspended. 3. Please refer to

No. **2.20** chapter ATX .

example

```

RING                                //Voice call

AT+CLCC

+CLCC: 1,0,0,1,0,"",128           //PS call in LTE mode

AT+CLCC

+CLCC: 2,1,4,0,0,"02154450290",129    //incoming call

OK

ATA                                // Answer this voice call using ATA

OK

```

7.2. ATD initiates a call

This command is used to establish a voice or data call, and can also be used to control supplementary services.

ATD initiates a call

Excuting an order

ATD<n>[<mgsm>];

Response If there is no dial tone and **ATX2** or **ATX4** is set:

NO DIAL TONE

If busy and set **ATX3** or **ATX4**:

BUSY

If the connection is not established successfully:

NO CARRIER

If a non-voice call is successfully initiated:

CONNECT <text>

TA switches to data mode.

Returns **<text>** only when **<value>** set by **ATX <value>** is greater than 0 . MT

returns to command mode after call release:

OK

If the voice call is successfully initiated:

OK

maximum response time

5 seconds, depending on network status (AT+COLP=0)

Feature Description

/

refer to

V.25ter

parameter

-
- <n>** Dial digit string and optional dial modifier in V.25ter. Dial digits:
0-9, *, #, +, A, B, C The following V.25ter dial modifiers can be ignored: , (comma), T, P, !, W, @ <mgsm> string **type** . GSM modifier.

| Activate CLIR (the calling user is not allowed to display his phone number on the called user's phone)
| Disable CLIR (the calling user is allowed to display his own phone number on the called user's phone)
G Only activate the closed user for this call Group requestg Deactivate the closed user group request only for this call. It is only available when establishing a voice call, and returns to the command state after the call ends.

<>

Remark

1. If ATH or a certain character is received during the execution of ATD, the command may be terminated. But in certain states of establishing a connection (such as: handshake state), the command will not be aborted.
2. **<mgsm>=l/i** is only applicable when there is no "*" or "#" in the dialing character.
3. For the detailed introduction of result code setting and call monitoring parameters, refer to **ATX** for details;
4. Response after dialing using **ATD** : For voice calls, two different response modes can be set:
 - ÿ After dialing is completed or after the call is established successfully , TA returns OK immediately. This setting is controlled by **AT+COLP** . ÿ The factory default setting is AT+COLP=0, that is, after dialing is completed, TA returns OK immediately. Otherwise TA returns **OK, BUSY, NO DIAL TONE** or **NO CARRIER**.
 - 5. On an active voice call, using **ATD**:
 - ÿ When there is already an activated voice call and the user initiates a second voice call, the first voice call will be automatically set as the called hold state.
 - ÿ The current status of all calls can be queried at any time using **AT+CLCC** .

example

```
ATD10086; //dial
OK
```

7.3. AT+COLP called line identification display

After the calling is established, this command enables or disables the calling party to obtain the called party's identity. For details, refer to the GSM/UMTS supplementary service COLP (Called Line Identification Prompt). MT enabling or disabling the display of COL (Called Line) on TE has no effect on the implementation of supplementary service COLR in the network.

Before any +CR or V.25ter response, TA returns an intermediate result code **OK to TE**.

AT+COLP called line identification display

test command AT+COLP=?	response +COLP: (list of supported <n>s) OK
query command AT+COLP?	response +COLP: <n>,<m> OK
set command AT+COLP=[<n>]	response OK
maximum response time	15 seconds, depending on network status
Feature Description	This command takes effect immediately, the parameter configuration is not saved.
refer to 3GPP TS 27.007	

parameter

<n>	Integer. Disable or enable display of result codes in TA. 0 — service in the network. 0 Do not provide COLP service 1
<m>	Provide COLP service 2 Unknown (such as: no network, etc.) <number> string type. Phone number, the format is specified by <type>. <type>

Integer. Octet address type (refer to 3GPP TS 24.008 Section 10.5.4.7). 128 Unknown type (number length is 0) 129 Unknown type (ISDN format) 145 International number type (ISDN format)

<subaddr> String type. Subaddress, the format is specified by **<satype>**. **<satype>** integer. The subaddress type in octets. (Refer to Section 10.5.4.8 of 3GPP TS 24.008) **<alpha>**

String type. Optional parameter, represented by alphanumeric, corresponding to the position of **<number>** in the telephone directory.

Remark

Intermediate result

code: After the result code is enabled (**<n>=1**) and the called party allows it, before responding to +CR and V.25ter, the following intermediate result code will be returned: **+COLP: <number>,<type>,[<subaddr>],[<satype>],[<alpha>]**

example

```
AT+CPBW=1,"02151082965",129,"QUECTEL"
OK
AT+COLP=1
OK
ATD02151082965;
+COLP: "02151082965",129,,,,"QUECTEL"

OK
```

7.4. **ATH** hangs up existing connections

This command is used to disconnect the current data call or voice call, that is, the local TE disconnects from the command line and terminates the call. You can also use **AT+CHUP** to hang up the voice call.

ATH hangs up existing connections	
Executing an order	response
ATH[n]	OK
maximum response time	90 seconds, depending on network status
Feature Description	/
refer to	
V.25ter	

parameter

<n> Integer.

0 Disconnect all existing calls from the command line and terminate the call

7.5. **AT+CHUP** hangs up the voice call

This command is used to cancel all active, waiting and held voice calls. To disconnect a data call, use **ATH**.

AT+CHUP hang up the voice call	
test command	response
AT+CHUP=?	OK
Executing an order	response
AT+CHUP	OK

	or ERROR
maximum response time	90 seconds, depending on network status
Feature Description	/
refer to	
3GPP 27.007	

example

RING	//Incoming
AT+CHUP	call//Hang up the call
OK	

7.6. +++ Switch from data mode to command mode

This command is only available when TA is in data mode. The +++ character makes TA cancel the data stream on the AT interface and switch to command mode. so AT commands can be entered while maintaining a data or GPRS connection to a remote server.

+++ Switch from data mode to command mode	
Executing an order	response
+++	OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
V.25ter	

Remark

1. In order to prevent the +++ escape sequence from being misunderstood as data, the following rules should be followed: 1) Do not enter any characters within 1 second **before entering +++**. 2) Input +++ within 1 second, and no other characters can be input within this time. 3) Do not enter any characters within 1 second **after entering +++**. 4) Switch to command mode ~~Steplessfully~~ ~~smoothly~~ ~~without loss~~.
- switch from command mode to data mode, enter **ATO**. 3. Another way to switch to command mode is by changing the DTR level, see **AT&D for details**.

7.7. ATO switches from command mode to data mode

This command is used to restore the connection and switch back from command mode to data mode.

ATO switches from command mode to data mode	
Executing an order	In
ATO[n]	response to failure to restore connection: NO CARRIER
	The connection is restored successfully, and TA returns from command mode to data mode: CONNECT <text>
maximum response time	300 milliseconds
Feature Description	/
refer to	V.25ter

parameter

<n>	Integer. 0 Switch back from command mode to data mode
------------------	--

Remark

When TA successfully switches from command mode to data mode, it will return **CONNECT <text>**. Note that **<text>** is only output when the parameter value **<value>** of **ATX<value>** is greater than 0 .

7.8. ATSO sets the number of rings before auto answer

This command is used to set the number of rings before automatic answering of incoming calls.

ATSO sets the number of rings before automatic answering	
query command	response
ATSO?	<n>
	OK
set command	response
ATSO=<n>	OK
maximum response time	300 milliseconds

Feature Description	The order is effective immediately. You need to execute AT&W to save the parameter configuration.
refer to V.25ter	

parameter

<n> Integer. Set the number of rings before automatic answering for incoming

calls 0 Disable automatic answering 1~255 After reaching the
specified ringing times, enable automatic answering

Remark

1. If the <n> value is set too high, the caller may stop calling before the call is automatically answered.
2. In VoLTE calls, only <n>=0 is supported.

example

```
ATS0=3 //Set to answer automatically after three rings
OK

RING //Call in

RING

RING // Automatically answer the call after ringing 3 times
```

7.9. AT+CLCC query current ME call

This command is used to query all current calls. If the command is successful but there is no call, no information will be sent to TE, only **OK** will be returned.

AT+CLCC query the current ME call	
test command	response
AT+CLCC=?	OK

Executing an order

AT+CLCC

Response [+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]
[+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]] [...]

	OK
If the error is related to ME functionality: +CME ERROR: <err>	
maximum response time	300 milliseconds
Feature Description	/

parameter

<idx> Integer. Caller ID (please refer to *3GPP TS 22.030 subclause 4.5.5.1*). Integer. 0 calling party (MO) 1 called party (MT) Integer. call state. 0 active state 1 call hold state 2 calling, dialing state 3 calling, ringback tone state 4 called, incoming call state 5 called, call waiting state **<mode> integer**. Bearer/call service. 0 voice call 1 data call 2 fax

<stat> integer. 0 not in multiparty call 1 in multiparty call **<number> string type. The phone number format is specified by <type>. <type> integer.** Address type in octets (refer to *3GPP TS 24.008 subclause 10.5.4.7*). usually as follows

<mpty>

Values:

129 Unknown type 145

International number (begins with "+") 161

National number **<number> in alphanumeric****<alpha>** format, corresponding to an entry in the phone book. error code. refer**<err>** to No. **12.5** chapter

example

```
ATD10086; // initiate a call
OK
AT+CLCC
+CLCC: 1,0,0,1,0,"",128 //PS call in LTE mode//Initiate a
+CLCC: 2,0,0,0,0,"10086",129 call and the call has been answered
```

OK

7.10. AT^DSCI indicates call status

This command is used to configure whether to use URC DSCI to indicate call status.

AT^DSCI indicates call status	
test command AT^DSCI=?	response ^DSCI: (list of supported <n>s) OK
query command AT^DSCI?	response ^DSCI: <n> OK
set command AT^DSCI=<n>	response OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.

parameter

<n> Integer. Configure whether to report call status through URC DSCI. 0 disable 1 enable integer. Call ID. Integer. call direction. 0 calling party (MO) 1 called party (MT) Integer. call state.

<id>

<dir>

<stat>

1 CALL_LOCAL_HOLD call local hold call initiation 2
call connection 3 CALL_CONNECT call access ~~CALLLONGCOMING~~
CALL_WAITING call end call waiting 5

6 CALL_END Call alert
0 voice calls 7 CALL_ALERTING Integer. call type.

<type>

1 PS call

<number> string type. cellphone number. <num_type>

Mobile phone number type.

Remark

If the call status report via URC DSCI is enabled (<n>=1), URC ^DSCI: <id>,<dir>,<stat>,<type>,<number>,<num_type> will be reported .

example

```
//dial
AT^DSCI=1                                         //Enable URC DSCI to report call status
OK
ATD10086;                                       //Dial 10086
OK

^DSCI: 1,0,2,0,10086,129                         // initiate a voice call

^DSCI: 1,0,7,0,10086,129                         // call reminder

^DSCI: 1,0,3,0,10086,129                         //Call connected successfully
ATH
OK

^DSCI: 1,0,6,0,10086,129                         // end of call

//incoming call
RING

^DSCI: 1,1,4,0,13022100000,129                  //new call incoming

RING

^DSCI: 1,1,6,0,13022100000,129                  // end of call

NO CARRIER
```

8 Phonebook related commands

8.1. AT+CNUM query the phone number

This command is used to read all the phone number records in the (U)SIM card.

AT+CNUM query the phone number	
test command	response
AT+CNUM=?	OK
Executing an order	response
AT+CNUM	[+CNUM: [<alpha>],<number>,<type>] [+CNUM: [<alpha>],<number>,<type>] OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP 27.007	

parameter

<alpha> String type. Associated with <number>, the character set used should be the character set set by **AT+CSCS**.

<number> string type. phone number. The format is determined by <type>. Integer.

129 Unknown type (ISDN format), 140 International number (ISDN format), 141 National number (ISDN format). Usually there are the following values for <type>:

<err>

No. 12.5 chapter

8.2. AT+CPBF search phonebook

This command is used to search for entries matching <findtext> in the current phonebook storage set by AT+CPBS , and all returned entries are arranged in alphanumeric order.

AT+CPBF search phone book	
test command	response
AT+CPBF=?	+CPBF: <nlength>,<tlength>
	OK
set command	
AT+CPBF=<findtext>	Response [+CPBF: <index>,<number>,<type>,<text>] [...]
	OK
	or
	ERROR
	If the error is related to ME functionality:
	+CME ERROR: <err>
maximum response time	Depends on the number of phonebook entries.
Feature Description	/
refer to	
3GPP 27.007	

parameter

<nlength> Integer. The maximum length of <number>.

<tlength> Integer. The maximum length of <text>.

<findtext> String type. The maximum length of this field is <tlength>, and the character set is set by AT+CSCS .

<index> Integer. The location of the phone number in memory. <number> string type. The format of the phone number, determined by <type>. Integer. Address type in octets (refer to 3GPP TS 24.008 subclause 10.5.4.7). Usually

<type> have the following values: 129 Unknown type (ISDN format) 145 International number (ISDN format) 161 National number string type. The maximum length of this field is <tlength>, and the character set is set by AT+CSCS . error code. refer to

<text>

<err>

No. 12.5 chapter

8.3. AT+CPBR read phonebook entries

This command is used to read the phonebook entry between <index1> and <index2> in the current phonebook memory set by AT+CPBS head. If only <index1> is input, only the phonebook entry at <index1> will be returned.

AT+CPBR read phonebook entries	
test command	response
AT+CPBR=?	+CPBR: (list of supported <index>),<nlength>,<tlength>
	OK
set command	
AT+CPBR=<index1>[,<index2>]	Response +CPBR: <index1>,<number>,<type>,<text> [+CPBR: <index2>,<number>,<type>,<text> [...]]
	OK
	or
	ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	Depends on the number of phonebook entries.
Feature Description	/
refer to	
3GPP 27.007	

parameter

<index> Integer. The index number of the phonebook memory

location. **<number>** string type. The format of the phone number, determined by

<type>. <nlength> Integer. The maximum length of <number>. <tlength>

Integer. The maximum length of <text>. <index1> integer. The starting position

in memory of the phone number to be read. **<index2>** integer. The ending position in

memory of the phone number to be read. Integer. Address type in octets (refer to 3GPP

<type> TS 24.008 subclause 10.5.4.7). Usually have the following values: 129 Unknown type (ISDN format) 145 International number (ISDN format) 161 National number **string type. The maximum length of this field is <tlength>, and the character set is set by AT+CSCS**. error code. refer to

<text>

<err>

No. 12.5 chapter

8.4. AT+CPBS set phone book memory

This command is used to set the phonebook memory, which will also be used when using other phonebook related commands. The query command returns the currently selected memory type, the number of currently used memory locations, and the total number of memory locations. The test command returns the range of arguments supported by the command.

AT+CPBS set phone book memory

test command

AT+CPBS=?

response

+CPBS: (list of supported <storage>s)

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

query command

AT+CPBS?

response

+CPBS: <storage>,<used>,<total>

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

set command

AT+CPBS=<storage>

response

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

maximum response time

300 milliseconds

Feature Description

/

parameter

3GPP 27.007

parameter

<storage> integer. Phonebook storage.

"SM" (U)SIM phonebook "DC"

dialed number (may not be applicable for **AT+CPBW**)

"FD"	(U)SIM card fixed dial phonebook (PIN2 code is required for AT+CPBW)
"LD"	(U)SIM card last dialed phonebook (may not be available for operation)
AT+CPBW 'AT+CPBW'	(U)SIM card or ME emergency call number (may not be available at "ON" (U)SIM Card Own Number List (MSISDN) "AP" setting)
"ON"	(U)SIM Card Own Number List (MSISDN) "AP" setting application phone book. If the UICC of the USIM application already exists, select the application phonebook DFPHONEBOOK under ADFUSIM.
"SDN"	Service Dial Integer.
<used>	The used memory locations in the current memory. Integer.
<total>	The total number of memory locations currently in memory.
<err>	error code. refer to No. 12.5 chapter

8.5. AT+CPBW write phonebook

This command is used to add or delete phone entries in the specified location <index> of the current memory set by **AT+CPBS** .

AT+CPBW write into phone book	
test command	response
AT+CPBW=?	+CPBW: (supported <index> range), <nlength>, (supported <type> list), <tlength> OK or ERROR If the error is related to ME functionality: +CME ERROR: <err>
set command	response
AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]	OK or ERROR If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
Reference 3GPP 27.007	

parameter

<index> Integer. The index number of the phonebook memory location. If this parameter is not specified, the first phonebook entry will be used. If only this parameter is specified, the phonebook entry specified by this parameter will be deleted.

<nlength> Integer. The maximum length of **<number>**.

<tlength> Integer. The maximum length of **<text>**.

<number> string type. The format of the phone number, determined by

following values for **<type>**: Integer Address type (refer to 3GPP TS 24.008 subclause 10.5.4.16). Usually, the number string type. The maximum length of this field is **<tlength>**, and the character set is set by AT+CSCS . error code. refer to

<text>

<err> No. 12.5 chapter

example

```
AT+CSCS="GSM"
OK
AT+CPBW=10,"15021012496",129,"QUECTEL" //Add a phone entry at position 10
OK
AT+CPBR=10                                // read phonebook entry
+CPBR: 10,"15021012496",129,"QUECTEL"

OK
AT+CPBW=10                                //Delete the phone entry at position 10
OK
```

9 Short message related commands

9.1. AT+CSMS select SMS type

This command is used to select the short message service type <service> and return the short message type supported by ME.

AT+CSMS select short message service type	
test command AT+CSMS=?	response +CSMS: (list of supported <service>)
	OK
query command AT+CSMS?	response +CSMS: <service>,<mt>,<mo>,<bm>
	OK
set command AT+CSMS=<service>	response +CSMS: <mt>,<mo>,<bm>
	OK
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to 3GPP TS 27.005	

parameter

<service> integer. Short message service type.

0 Refer to 3GPP TS 23.040 and 3GPP TS 23.041 for details (AT command syntax of SMS is compatible with 3GPP TS 27.005 Phase 2

4.7.0 version; support Phase 2+ functions that do not require new command syntax (for example: use Phase 2+ new coding scheme correction message routing))

1 For details, refer to 3GPP TS 23.040 and 3GPP TS 23.041 (the AT command syntax of SMS is compatible with 3GPP TS 27.005 Phase

2+ version; the requirements when it is set to 1 have been explained in the corresponding command description.)

<mt>	Integer. Called short message. 0 does not support 1 supports <u>integer</u> . Caller short message.
<mo>	0 does not support 1 supports <u>integer</u> . Broadcast type short message. 0 does not support <u>integer</u> .
<bm>	1 supports error codes. refer to <u>—</u>

<err>

No. 12.6 chapter

example

```

AT+CSMS=?                                //List supported SMS types
+CSMS: (0,1)

OK
AT+CSMS=1                                //Set SMS type to 1
+CSMS: 1,1,1

OK
AT+CSMS?                                //Query the current SMS type
+CSMS: 1,1,1,1

OK

```

9.2. AT+CMGF configure short message mode

This command is used to specify the format of the short message. <mode> indicates whether text mode or PDU mode is used when reading/writing short messages between TA-TE. The message format can be set to PDU mode (using the entire TP data unit) or text mode (the message header and message body are displayed in different parameter forms). The text mode **informs** TA-TE of the character set used in the message body in the interaction through the <chset> specified by **AT+CSCS** .

AT+CMGF configure short message mode	
Test	response
command AT+CMGF=?	+CMGF: (list of supported <mode>s)
	OK
query command	response
AT+CMGF?	+CMGF: <mode>
	OK

set command AT+CMGF[=<mode>]	response OK
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.005	

parameter

<mode> integer. SMS mode.

0 PDU mode 1 Text
mode

9.3. AT+CSCA set short message service center address

This setting command is used to update the SMSC (Short Message Service Center) address after actively sending a short message. In text mode, use the set command to set. In PDU mode, only when the length code of the SMSC address is <pdu>=0 , it can be set with the setting command.

AT+CSCA set short message service center address	
test command AT+CSCA=?	response OK
Query command AT+CSCA?	response +CSCA: <sca>,<tosca>
	OK
set command AT+CSCA=<sca>[,<tosca>]	response OK
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.005	

parameter

<sca> String type. Short message service center address. For details, refer to 3GPP TS 24.011 RP SC address Address-Value field; BCD code (or GSM 7-bit default alphabetic characters) is converted to the characters of the currently selected TE character set (refer to AT+CSCS in 3GPP TS 27.007). Address types are defined by <tosca>.

<tosca> Integer. Short message service center address type. For details refer to 3GPP TS 24.011 octet in RP SC address Type-of-Address (see <toda>). error code.

<err> refer to **No. 12.6 chapter**

example

```
AT+CSCA="+8613800210500",145 //Set the short message service center address
```

```
OK
```

```
AT+CSCA?
```

```
+CSCA: "+8613800210500",145
```

```
OK
```

9.4. AT+CPMS configure the preferred storage location for short messages

This command is used to select query or configure short message storage location, including <mem1>, <mem2> and <mem3>.

AT+CPMS configuration short message preferred storage location	
test command	response
AT+CPMS=?	+CPMS: (list of supported <mem1>), (list of supported <mem2>), (list of supported <mem3>)
	OK
query command	response
AT+CPMS?	+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>
	OK
set command	response
AT+CPMS=<mem1>[,<mem2>[,<mem 3>]]	+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>
	If the error is related to ME functionality: +CMS ERROR: <err>

maximum response time	300 milliseconds
Feature Description	/
refer to 3GPP TS 27.005	

parameter

<mem1> String type. Memory for reading and deleting short messages.

"SM" (U)SIM card
"ME" mobile device

<mem2> String type. Memory for writing and sending short messages.

"SM" (U)SIM card
"ME" mobile device

<mem3> String type. If no route to TE is established (refer to AT+CNMI), the received short message is stored in this memory

Inside.

"SM" (U)SIM card
"ME" Mobile Equipment

<usedx> integer. The number of current short messages in <memx>.

<totalx> integer. The total number of short messages that can be stored in

<memx>. **<err>** Error code. refer to No. **12.6** chapter

example

```
AT+CPMS="SM","SM","SM"          //Change the short message memory to "SM"
+CPMS: 0,50,0,50,0,50

OK
AT+CPMS?                      //Query the current short message memory
+CPMS: "SM",0,50,"SM",0,50,"SM",0,50

OK
```

9.5. AT+CMGD delete short message

This command is used to delete the short message located at <index> from the preferred memory <mem1>. If <delflag> is specified and not 0, ME shall save Omit <index> and follow <delflag> parameter rules.

AT+CMGD delete short message

Test

command **AT+CMGD=?**

response

+CMGD: (supported <index> range), (supported <delflag> range)

	OK
set command AT+CMGD=<index>[,<delflag>]	response OK
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds <delflag> depends on the memory of deleted short messages
Feature Description	/
refer to 3GPP TS 27.005	

parameter

<index> Integer. Location number supported by the associated memory. **<delflag>** integer. 0 Delete the short message specified
by **<index>** 1 Delete all the read short messages in <mem1> memory 2 Delete all the read short messages and sent short messages in <mem1> memory 3 Delete all the read short messages in <mem1> memory Short messages, sent and unsent short messages 4 Delete all short messages **<mem1>** string type in <mem1> memory. Memory for reading and deleting short messages.

"SM" (U)SIM card

"ME" Mobile device error**<err>** code. refer to No. **12.6** chapter

example

```
AT+CMGD=1 //Delete the short message with <index>=1 in the memory
OK

AT+CMGD=1,4 //Delete all short messages in <mem1> memory
OK
```

9.6. AT+CMGL read short message by status

This command is used to list the short messages and their status in <mem1>. If the status of the short message is "REC UNREAD", the status of the short message in the memory will be changed to "REC READ". If execute **AT+CMGL** without setting <stat>, the module will report the list of short messages whose status is "REC UNREAD".

AT+CMGL read short message by status

test command

AT+CMGL=?

response

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

OK

set command

AT+CMGL[=<stat>]

Response 1) Text mode (AT+CMGF=1) and the command was executed successfully: For SMS-SUBMIT and/or SMS-DELIVER:

+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/tod a>,<length>]<CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<da/ oa>,[<alpha>],<scts>][,<tooa/tod a>,<length>]<CR><LF><data>[...]]

For SMS-STATUS-REPORT: +CMGL:

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF> +CMGL:<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]]

For SMS-COMMAND: +CMGL:

<index>,<stat>,<fo>,<ct>[<CR><LF> +CMGL:<index>,<stat>,<fo>,<ct>[. ...]]

For CBM storage:

+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF> <data>[<CR><LF> +CMGL: < index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]]

OK

2) PDU mode (AT+CMGF=0) and the command is executed successfully:

+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF> +CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu> [...]]

	OK
	If the error is related to ME functionality: +CMS ERROR: <err>
Executing an order AT+CMGL	The response enumerates all received but unread short messages in the short message memory <mem1>, and then the state of the short messages in the memory is changed to "REC READ". 300 milliseconds <delflag> depends on the memory where the short message is listed
maximum response time	
Feature Description	/
refer to 3GPP TS 27.005	

parameter

<stat>	1) Text mode, string type. "REC UNREAD" Received but unread SMS "REC READ" Received and read SMS "STO UNSENT" Stored but unsent SMS "STO SENT" Stored and sent all SMS Message 2) PDU mode, integer. 0 Received but unread short "ALL" messages 1 Received and read short messages 2 Stored but unsent short messages 3 <u>Stored and sent short messages</u> 4 All short messages
---------------------	---

<index> Integer. Location number supported by the associated memory. **<da>** String type. target address. For details, refer to the TP-Destination-Address Address-Value field in 3GPP TS 23.040 ; the BCD code (or GSM 7-bit default letter format characters) is converted to the characters in the currently selected TE character set (for details, refer to AT+ in 3GPP TS 27.007 CSCS). Address types are defined by <toda>. String type. sender address. For **<oa>** details, refer to the TP-Originating-Address Address-Value field in 3GPP TS 23.040 ; BCD code (or characters in the GSM 7-bit default alphabet format) is converted to the currently selected TE character set (for details, refer to AT+ in 3GPP TS 27.007 CSCS). The address type is defined by <tooa>. **<alpha>** String type. <da> or <oa> in alphanumeric format, corresponding to an entry in the MT phonebook. The realization of this function is based on the factory settings, and the character set used should be the same as the character set selected by **AT+CSCS** (for details, refer to the definition of this command in 3GPP TS 27.007). **<scts>** String type. The timestamp of the short message service center. For details, refer to 3GPP TS 23.040

Time character in TP-Service-Center-Time-Stamp. (see <dt>)

<toda> Integer. Receiver address type. For details, refer to the eight bytes in 3GPP TS 24.011 TP-Recipient-Address Type-of-Address.

<tooa> Integer. Sender address type. For details, refer to the eight bytes in 3GPP TS 24.011 TP-Originating-Address Type-of-Address. (Refer to <toda> for the default value)

<length> integer. Short message length.

In text mode (AT+CMGF=1), it indicates the length of the message body <data>; in

PDU mode (AT+CMGF=0), it indicates the length of the actual TP data unit in units of octets (that is, the length of the RP layer Eight characters in the short message service center address will not be counted in this length).

<data> If it is a short message, the format refers to 3GPP TS 23.040 TP-User-Data:

1. If it is <dcs>, it means to use 3GPP TS 23.038 GSM 7 -digit default letter, and <fo> means that 3GPP is not set TS 23.040 TP-User-Data-Header-Indication.

2. If the TE character set is set to a non-HEX format (see AT+CSCS in 3GPP TS 27.007), ME/TA converts the GSM alphabet into the current TE character set according to the rules in Appendix A of 3GPP TS 27.007 . 3. If the TE character set is set to HEX format, ME/TA converts each 7-digit character of the GSM 7-digit default alphabet into a hexadecimal number of two IRA characters (for example: character ѕ (GSM 7-digit default alphabet 23) for 17 (IRA 49 and 55)).

4. If <dcs> indicates the use of 8-bit or UCS2 data encoding scheme, or <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication has been set, ME/TA converts each octet into two The hexadecimal number of the the IRA character (eg: convert an octet with integer value 42 to two characters 2A (IRA 50 and 65) to TE).

If it is CBS, the message content in 3GPP TS 23.041 CBM text mode response; format: 1. If it is <dcs>, it means to use 3GPP TS 23.038 GSM 7-digit default letter. 2. If the TE character set is set to a non-HEX format (see AT+CSCS in 3GPP TS 27.007), ME/TA converts the GSM alphabet into the current TE character set according to the rules in Appendix A of 3GPP TS 27.007 . 3. If the TE character set is set to HEX format, ME/TA converts each 7-bit character of the GSM 7-bit default alphabet into A hexadecimal number that is two IRA characters long.

4. If <dcs> indicates the use of 8-bit or UCS2 data encoding scheme: ME/TA converts each octet into two IRAs A hexadecimal number of characters long.

<fo> Integer. Depends on command or result code: First octet of 3GPP TS 23.040 SMS-DELIVER, SMS-SUBMIT (default: 17), SMS-STATUS-REPORT or SMS-COMMAND (default: 2) . Integer. For details, refer to 3GPP TS 23.040 TP-

<mra> Message-Reference. String type. For details, refer to 3GPP TS 23.040 TP-Recipient-Address Address-Value field;

<ra> BCD code (or GSM 7-bit default alphabet format) is converted to the currently selected TE character set characters (for details, refer to AT+CSCS in 3GPP TS 27.007). The address type is specified by <tora>. <tora> Integer. For details, refer to the octet Type-of-Address in 3GPP TS 24.011 TP-Recipient-Address (**default reference <toda>**). <scts> Time string type. For details, refer to 3GPP TS 23.040 TP-Service-Centre-Time-Stamp (see <dt>). Time string type. For details, refer to 3GPP TS 23.040 TP-Discharge-Time. The format is: "yy/MM/dd, hh:mm:ss+zz", the characters in the format represent year (the last two digits), month, day, hour, minute, second, and time zone in turn. For example: 22:10:00, May 6, 1994, GMT+2 hours are represented

<dt> by "94/05/06, 22:10:00+08". Integer. For details, refer to 3GPP TS 23.040 TP-Status. Integer. For details, refer to 3GPP TS 23.040 TP-Command-Type (the default is 0). Integer. Refer to 3GPP TS 23.041 CBM No. for details.

<st>

<ct>

<sn>

<mid> integer. For details, refer to 3GPP TS 23.041 CBM Short Message Identifier. <page>

Integer. For details, refer to 3GPP TS 23.041 CBM page parameter bits 4~7. <pages> Integer.

For details, refer to 3GPP TS 23.041 CBM page parameter bits 0~3. <pdu>

In the case of short messages: 3GPP TS 24.011 service center address, follow 3GPP TS 23.040 TPDU, hexadecimal format; ME/TA converts each octet in the TP data unit into a hexadecimal number containing 2 IRA characters (like:

An octet with an integer value of 42 is sent to the TE as two characters (2A, ie IRA 50 and 65). <mem1>

String type. Memory for reading and deleting short messages.

"SM" (U)SIM card

"ME" Mobile device

<err> error code. refer to No. 12.6 chapter

example

```
AT+CMGF=1          //Set the short message to text mode
OK
AT+CMGL="ALL"      //List all short messages in the short message memory
+CMGL: 1,"STO UNSENT","","",
<This is a test from Quectel>
+CMGL: 2,"STO UNSENT","","",
<This is a test from Quectel>

OK
```

9.7. AT+CMGR read short message according to index

This command is used to read the short message specified by <index> from the memory <mem1>. If the short message is in "REC UNREAD", then The status of the short message in the memory will change to "REC READ".

AT+CMGR read short message according to index

Test	response
command AT+CMGR=?	OK
set command	
AT+CMGR=<index>	<p>Response In non-CDMA</p> <p>mode: 1) Text mode (AT+CMGF=1) and the command is executed successfully: For SMS-DELIVER:</p> <p>+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pi>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data></p>
	OK
	<p>For SMS-SUBMIT:</p> <p>+CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dc s>,<vp>],<sca>,<tosca>,<length>]<CR><LF><data></p>
	OK
	<p>For SMS-STATUS-REPORT:</p>

+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

OK

For SMS-COMMAND:

+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]

OK

For CBM storage:

+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>

OK

2) PDU mode (AT+CMGF=0) and the command is executed successfully:

+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>

OK

If the error is related to ME functionality:

+CMS ERROR: <err>

maximum response time

Depends on the length of the short message content.

Feature Description

/

refer to

3GPP TS 27.005

parameter

<index> Integer. The location number of the

memory. **<stat>** 1) Text mode, string type.

"REC UNREAD" Received but unread SMS "REC
READ" Received and read SMS "STO UNSENT"
Stored but unsent SMS "STO SENT" Stored and sent all
SMS Message 2) PDU mode, integer.
"ALL"

0	Received but unread short
1	messages Received and read
2	short messages Stored but unsent
3	short messages Stored and sent short messages

4

all short messages

<alpha> String type. <da> or <oa> in alphanumeric format, corresponding to an entry in the MT phonebook. The realization of this function is based on the factory settings, and the character set used should be the same as the character set selected by **AT+CSCS** (for details, refer to the definition of this command in 3GPP TS 27.007).

<da> String type. target address. For details, refer to the TP-Destination-Address Address-Value field in 3GPP TS 23.040 ; the BCD code (or GSM 7-bit default letter format characters) is converted to the characters in the currently selected TE character set (for details, refer to AT+ in 3GPP TS 27.007 CSCS). The address type is specified by <toda>.

<oa> String type. sender address. For details, refer to the TP-Originating-Address Address-Value field in 3GPP TS 23.040 ; the BCD code (characters in GSM 7-bit default alphabetic format) is converted to the characters in the currently selected TE character set (for details, refer to AT+CSCS in TS 27.007) . The address type is specified by <tooa>. **<scts>** String type. The timestamp of the short message service center. For details, refer to 3GPP TS 23.040 TP-Service-Center-Time-Stamp (see <dts>).

<fo> Integer. The first octet. Depends on command or result code. For details, refer to 3GPP TS 23.040 SMS-DELIVER, The first octet of SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND. As long as a valid parameter value has been entered, the parameter can be omitted later.

<pid> integer. protocol identifier. For details, refer to 3GPP TS 23.040 TP-Protocol-Identifier. Default value: 0. **<dcs>** integer. Data encoding scheme. Depends on command or result code. For details, refer to 3GPP TS 23.038 Short Message Data Encoding Method scheme (default 0) or cell broadcast data encoding scheme.

<vp> Integer or time string type. expiration date. Depends on the setting of SMS-SUBMIT <fo>. For details, refer to 3GPP TS 23.040 TP-Validity-Period (see <dts>). **<mn>** Integer. SMS ID. For details, refer to 3GPP TS 23.040 TP-Message-Number. **<mrs>** Integer. Short message reference. For details, refer to 3GPP TS 23.040 TP-Message-Reference. **<ra>** String type. For details, refer to 3GPP TS 23.040 TP-Recipient-Address Address-Value field; BCD code (or GSM 7-bit default letter format) is converted to the currently selected TE character set characters (refer to **AT+CSCS** for details). **The address type is specified by <tora>.** **<tora>** Integer. For details, refer to 3GPP TS 24.011 TP-Recipient-Address Type-of-Address (see <toda>). **<toda>** Integer. Receiver address type. For details, refer to 3GPP TS 24.011 TP-Recipient-Address Type-of-Address. **<tooa>** Integer. Sender address type. For details, refer to 3GPP TS 24.011 TP-Originating-Address Type-of-Address (**default value refers to <toda>**). **<sca>** String type. Short message service center address. For details, refer to 3GPP TS 24.011 RP SC address Address-Value; BCD code (or GSM 7-bit default letter format) is converted to the currently selected TE character set characters (for details, refer to **AT+CSCS** in 3GPP TS 27.007). The address type is specified by <tosca>. **<tosca>** Integer. Short message service center address type. For details, refer to 3GPP TS 24.011 RP SC Address Type-of-Address (**default value refers to <toda>**).

<length> integer. Short message length. In text mode (AT+CMGF=1), it indicates the length of the message body <data> (or <cdata>); in PDU mode (AT+CMGF=0), it indicates the length of the actual TP data unit in octets length (that is, the octet in the short message service center address of the RP layer will not be counted in this length).

<data> The text content of the short message. For details, No. **12.8** chapter

see **<pdu>** In the case of short messages: 3GPP TS 24.011 service center address, follow 3GPP TS 23.040 TPDU, hexadecimal format: ME/ TA converts each octet in the TP data unit into an octet containing 2 IRA characters A hexadecimal number (eg: an octet with an integer value of 42 is sent to the TE as two characters (2A, ie IRA 50 and 65)).

<dts> Time string type. For details, refer to 3GPP TS 23.040 TP-Discharge-Time. The format is: "yy/MM/dd,

"hh:mm:ss+zz", the characters in the format represent year (the last two digits), month, day, hour, minute, second, and time zone. For example: May 6, 1994 22:10:00, GMT+ 2 hours is represented by "94/05/06, 22:10:00+08". Integer type.

<st> For details, refer to 3GPP TS 23.040 TP-Status. Integer type. For details, refer to 3GPP TS 23.040 TP-Command-Type

<ct> (default is 0).

<cdata> For details, refer to 3GPP TS 23.040 TP-Command-Data Text Mode Response. ME/TA converts each octet in the TP data unit into a hexadecimal number containing 2 IRA characters (eg: octet with integer value 42 as two characters (2A, ie IRA 50 and 65) Send to TE). Integer. serial number. **<mid>** integer. Message identifier. **<page>** Integer. page. **<pages>** Integer. The total parameter bits are 0~3. **<mem1>** String type. Memory for reading and deleting short messages.

"SM" (U)SIM card
"ME" Mobile device

<err> error code. refer to

No. **12.6** chapter

example

```
+CMTI: "SM",3 //A new short message has been received, stored in the (U)SIM card where <index> is 3
AT+CSDH=1
OK
AT+CMGR=3 // read short message
+CMGR: "REC UNREAD","+8615021012496","","18/12/15,15:06:37+32",145,4,0,0,"+8613800210500", 145,27

<This is a test from Quectel>

OK
```

9.8. AT+CMGS send short message

This command is used to send short message (SMS-SUBMIT) from TE to network layer. After calling the setup command, return to > and input the data to be sent, then press **Ctrl+Z** to indicate the end of the PDU and send a short message. You can press **ESC** to cancel the sending, and if the cancellation is successful, it will return **OK** to stop sending. After sending successfully, it will return the short message reference value <mr> to TE. <mr> can be used to identify messages based on unsolicited status result codes.

AT+CMGS send short message	
test command	response
AT+CMGS=?	OK
Set	response
command 1) Text mode (AT+CMGF=1):	
AT+CMGS=<da>[,<toda>]<CR> input text	1) Text mode (AT+CMGF=1) and the sending is successful: +CMGS: <mr>

Ctrl+Z to send / ESC to cancel sending	OK
2) PDU mode (AT+CMGF=0): AT+CMGS=<length><CR> specify PDU Ctrl+Z to send / ESC to cancel sending	2) PDU mode (AT+CMGF=0) and send successfully: +CMGS: <mr> OK If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	120 seconds, depending on network status
Feature Description	/
Refer to 3GPP TS 27.005	

parameter

<da> String type. target address. For details, refer to 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD code (or characters in GSM 7-bit default alphabet format) is converted to characters in the currently selected TE character set (For details, refer to AT+CSCS in 3GPP TS 27.007). Address types are defined by **<toda>**.

<toda> Integer. Destination address type. For details, refer to 3GPP TS 24.011 TP-Destination-Address Type-of-Address. **<length>** integer. Message body length. In **text mode (AT+CMGF=1)**, it indicates the character length of **<data>** (or **<cdata>**); in PDU mode (**AT+CMGF=0**), it indicates the actual TP data unit length in octet format (ie The octets in the short message service center address of the RP layer will not be counted in this length).

<mr> Integer. Message reference value. For details, refer to 3GPP TS 23.040 TP-Message-Reference. **<err>** Error code. refer to No. **12.6** chapter

example

```
AT+CMGF=1                                //Set the short message mode to text mode
OK
AT+CSCS="GSM"                          //Set TE input character set format to GSM format
OK
AT+CMGS="15021012496"
> <This is a test from Quectel>          //Enter the short message content, Ctrl+Z to send, ESC to cancel sending
+CMGS: 247

OK
```

9.9. AT+CMMS send multiple short messages

This command is used to control the continuity of the short message interruption protocol link. If this function is enabled (and the network currently in use supports it), the link remains open. On, in this case multiple short messages can be sent quickly.

AT+CMMS send multiple short messages	
test command	response
AT+CMMS=?	+CMMS: (supported <n> ranges)
	OK
Query	response
command AT+CMMS?	+CMMS: <n>
	OK
set command	response
AT+CMMS=<n>	OK
	or
	ERROR
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	120 seconds, depending on network status
Feature Description	The order is effective immediately
refer to	
3GPP TS 27.005	

parameter

- <n>** Integer. Whether to enable the short message interruption protocol link function. 0 disables the function 1 keeps the function enabled until the response of the latest command to be sent (AT+CMGS, AT+CMSS, etc.)
- The time interval between the next commands to be sent exceeds 1~5 seconds (the exact value depends on the ME). Then ME closes the link, TA **automatically switches <n> to 0**
- 2 Enable the function. If the time interval between the response of the latest command to be sent and the next command to be sent exceeds 1~5 seconds (the specific value depends on ME), ME closes the link, but TA will not automatically switch <n> to 0

<err> Error code. refer to

No. **12.6** chapter

Remark

After executing the query command, please wait for 5~10 seconds before executing the setting command, otherwise, the error code +CMS ERROR: 500 may be returned .

9.10. AT+CMGW store short message

This command is used to write a short message (SMS-DELIVER or SMS-SUBMIT) and store it in <mem2>, and return the storage location <index> of the stored short message. Through <stat>, the short message can be set to the specified state. By default the SMS status is set to "STO UNSENT". The input data statement is the same as the setting command of **AT+CMGS**.

AT+CMGW store short message	
test command AT+CMGW=?	response OK
Set command 1) Text mode (AT+CMGF=1): AT+CMGW=<oa/da>[,<tooa/toda>[,<stat>] >]]<CR> >Enter text Ctrl+Z to send/ESC to cancel sending	Response If the message is written successfully: +CMGW: <index> OK If the error is related to ME functionality: +CMS ERROR: <err>
2) PDU mode (AT+CMGF=0): AT+CMGW=<length>[,<stat>]<CR> specify PDU Ctrl+Z to send/ESC to cancel sending	
maximum response time	300 milliseconds
Feature Description	/
refer to 3GPP TS 27.005	

parameter

<da>	String type. target address. For details, refer to 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD code (or characters in GSM 7-bit default alphabet format) is converted to characters in the currently selected TE character set (For details, refer to AT+CSCS in 3GPP TS 27.007). The address type is specified by <toda>.
<oa>	String type. sender address. For details, refer to 3GPP TS 23.040 TP-Originating-Address Address-Value field; BCD code (or characters in GSM 7-bit default alphabetic format) is converted to characters in the currently selected TE character set (for details, refer to AT+CSCS in 3GPP TS 27.007). The address type is specified by <tooa>. Integer. Sender address type. For details, refer to
<tooa>	3GPP TS 24.011 TP-Originating-Address Type-of-Address (default value refers to <toda>). 1) Text mode, string type.

<stat>

"REC UNREAD" Received but unread SMS "REC READ"
Received and read SMS "STO UNSENT" Stored but unsent
SMS "STO SENT" Stored and sent all SMS Message 2) PDU mode, integer.
"ALL"

0 Received but unread short
 messages 1 Received and read
 short messages 2 Stored but unsent
 short messages 3 Stored and sent
 short messages 4 All short messages

<toda> integer . Receiver address type. For details, refer to 3GPP TS 24.011 TP-Recipient-Address Type-of-Address field.

<length> integer. Short message length. **In**

text mode (AT+CMGF=1), it indicates the character length of <data> (or <cdata>) message body;
in PDU mode (AT+CMGF=0), it indicates the length of eight actual TP data units (ie, RP Octet characters in the
SMSC address of the stratum will not be counted in this length). In the case of short messages: 3GPP TS 24.011

<pdu> service center address, follow 3GPP TS 23.040 TPDU, hexadecimal format; ME/TA converts every eight characters in the TP data unit into hexadecimal numbers containing 2 IRA characters (For example: An octet with an integer value of 42 is sent to TE as a 2-digit number (2A, ie IRA 50 and 65).

<index> Integer. The serial number of the short message in

memory <mem2>. <mem2> String type. Memory for writing and sending short messages.

"SM" (U)SIM card
 "ME" Mobile device

<err> error code. refer to No. **12.6** chapter

example

```

AT+CMGF=1                                     //Set the short message mode to text mode
OK

AT+CSCS="GSM"                               //Set TE input character set format to GSM format
OK

AT+CMGW="15021012496"

> <This is a test from Quectel> //Enter the text content of the short message, press Ctrl+Z to write the short message, press ESC to cancel sending

+CMGW: 4

OK

AT+CMGF=0                                     //Set the short message mode to PDU mode
OK

AT+CMGW=18

> 0051FF0000008000A0500030002016D4B8BD5
+CMGW: 5

OK

```

9.11. AT+CMSS send short message from memory

This command is used to send the specified <index> short message (SMS-SUBMIT) from the memory <mem2>. If the SMS-SUBMIT short message recipient address <da> is specified, the new address is used to replace the destination address contained in the short message in the memory when sending the short message. After sending successfully, the reference value <mr> will be returned to TE. The parameter value of the UTS status report result code can be used for short message identification.

AT+CMSS Send short message from memory

test command	response
AT+CMSS=?	OK
set command	
AT+CMSS=<index>[,<da>[,<toda>]]	<p>Response 1) Text mode (AT+CMGF=1) and successful execution: +CMSS: <mr>[,<scts>]</p> <p>OK</p> <p>2) PDU mode (AT+CMGF=0) and successful execution: +CMSS: <mr>[,<ackpdu>]</p> <p>OK</p> <p>or</p> <p>ERROR</p> <p>If the error is related to ME functionality: +CMS ERROR: <err></p>
maximum response time	120 seconds, determined by network status
Feature Description	/
Refer	
to 3GPP TS 27.005	

parameter

<index> Integer. Memory location number.

<da> String type. target address. For details, refer to 3GPP TS 23.040 TP-Destination-Address Address-Value field; BCD code (or characters in GSM 7-bit default alphabetic format) is converted to characters in the currently selected TE character set (for details, refer to AT+CSCS in 3GPP TS 27.007) ;The address type is specified by <toda>. **<toda>** Integer. Receiver address type. For details, refer to 3GPP TS 24.011 TP-Destination-Address

Type-of-Address. Integer.

<mr> Short message reference. For details, refer to 3GPP TS 23.040 TP-Message-Reference.

<scts> String type. Service center timestamp. For details, refer to 3GPP TS 23.040 TP-Service-Centre-Time Stamp. (refer to <dt>) **<ackpdu>** string type. The format is the same as <pdu> in the short message, but without the address word in 3GPP TS 24.011 SC

part. <mem2> String type. Memory for writing and sending short messages.

"SM" (U)SIM card

"ME" Mobile device

<err> error code. refer to No. 12.6 chapter

example

```
AT+CMGF=1 //Set the short message mode to text mode
OK

AT+CSCS="GSM" //Set TE input character set format to GSM format
OK

AT+CMGW="15021012496"

> Hello //Enter the content of the short message, Ctrl+Z to send the short message, ESC to cancel sending
+CMGW: 4

OK

AT+CMSS=4 //Send a short message with <index> 4 from the memory
+CMSS: 54

OK
```

9.12. AT+CNMA new short message confirmation

This command is used to confirm whether the new message (SMS-DELIVER or SMS-STATUS-REPORT) sent directly to TE has been sent successfully. If the UE does not receive the confirmation within the required time (network timeout), it will send **RP-ERROR** to the network. UE can automatically prohibit sending to TE by setting **AT+CNMI** parameters <m1> and <d1> to 0.

AT+CNMA new short message confirmation

test command

response

AT+CNMA=?

+CNMA: (supported <n> ranges)

OK

Executing an order

response

AT+CNMA

OK

or

ERROR

If the error is related to ME functionality:

+CMS ERROR: <err>

set command

response

AT+CNMA=<n>	OK or ERROR
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.005	

parameter

<n>	Integer. Required parameter for PDU mode. 0 The command operation is similar to the text mode 1 Send positive response (RP-ACK) to the network, only accept in PDU mode 2 Send negative response (RP-ERROR) to the network, only accept
<err>	error code in PDU mode. Refer to

Remark

Only when **<service>** in **AT+CSMS** is 1 (phase 2+) and the module sends the corresponding URC as follows, the execution command and setting command can be used:

- +CMT: <mt>=2**, new message categories are 0, 1, 3 and none
- +CMT: <mt>=3**, new message categories are 0 and 3
- +CDS: <ds>=1**

example

```

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

OK
AT+CNMI=1,2,0,0,0
OK

+CMT: "+8615021012496", "18/12/15,17:07:21+32",145,4,0,0,"+8613800551500",145,28 // Receive a new short
from Quectel. //Send a confirmation message to the message, directly Output short message content This is a test
AT+CNMA
OK
AT+CNMA
+CMS ERROR: 340 //Return an error for the second time, only need to confirm once

```

9.13. AT+CNMI set short message reporting method

This command is used to configure the reporting method when the module receives a new short message. This setting command selects the way the new message received from the network is indicated to the TE when the TE is active (DTR is at low level (ON)). If TE is inactive (DTR is high (OFF)), the message shall be received in accordance with the provisions in 3GPP TS 23.038 .

AT+CNMI set the short message reporting method

Test command	response
AT+CNMI=?	+CNMI: (supported <mode> range), (supported <mt> range), (supported <bm> list), (supported <ds> range), (supported <bfr> list)
	OK
Query	response
command AT+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>
	OK
set command	response
AT+CNMI[=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	OK or ERROR
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.005	

parameter

<mode> integer. 0 Buffer

unsolicited result codes in TA. If the TA result code buffer is full, the result code indication can be stored in other buffers.

flush or discard the oldest result code indication and replace it with the newly received indication

1 If the link between TA-TE is reserved (i.e. in online data mode), discard the indication and reject the newly received short message

Result code indication, otherwise, directly forward to TE

2 If the link between TA-TE is reserved (for example: in online data mode), buffer the unsolicited result code in TA and

Send the result code to TE, otherwise, forward it directly to TE

<mt> Integer. New short message reporting method. The rules for storing received short messages depend on its data encoding scheme (refer to 3GPP TS 23.038) and the setting of preferred storage (AT+CPMS), and its value is: 0 Do not send SMS-DELIVER instruction to TE 1 If SMS-DELIVER stores To ME/TA, new short message prompt through URC +CMTI: <mem>,<index>

sent to TE

2 New short message SMS-DELIVER (except type 2) via URC +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode)
or +CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text
mode), see the AT+ CSDH command for related parameter explanation) or ^HCMT:
<oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data> (CDMA short message text
mode) to send to TE. Type 2 message result indication as defined by <mt>=1

3 When the third type of short message SMS-DELIVER is received, the new short message is sent to TE through the URC defined when
<mt>=2. Non-category 3 short messages, new short messages are sent to TE through the URC defined when <mt>=1
<bm> Integer. The CBM rules for storage reception depend on its data encoding scheme (refer to 3GPP TS 23.038 for details) and the setting
of the selected cell broadcast message type (AT+CSCB). 0 No CBM indication is sent to TE 2 Received CBM is sent
directly to TE using the following URC:

+CBM: <length><CR><LF><pdu> (PDU mode) or +CBM:
<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text
mode) <ds> integer. The reporting method of the short message status report.

0 Do not send status report SMS-STATUS-REPORT to TE 1 Status report

SMS-STATUS-REPORT is reported to TE through the following URC:

+CDS: <length><CR><LF><pdu> (PDU mode) or

+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode) 2 If SMS-STATUS-
REPORT is stored in ME/ TA, message status is reported to TE through the following URC:

+CDSI: <mem>,<index> integer.

<bfrr> 0 When <mode> is 1 or 2, send the non-
request result code in TA buffer to TE (the error code will be returned before sending
Back to OK)

1 When <mode> is 1 or 2, clear the unsolicited result code <err> error code of
the TA buffer. refer to

No. 12.6 chapter

Remark

URC description:

+CMTI: <mem>,<index>

Indicates that a new message has been received

+CMT: [<alpha>],<length><CR><LF><pdu> means direct output of short messages means

+CBM: <length><CR><LF><pdu> direct output of cell broadcast messages

example

AT+CMGF=1	//Set the short message mode to text mode
------------------	---

OK	
----	--

AT+CSCS="GSM"	//Set TE input character set format to GSM format
----------------------	---

OK	
----	--

AT+CNMI=1,2,0,1,0 //Set SMS-DELIVER message sent directly to TE

OK

+CMT: "+8615021012496", "18/12/15,17:07:21+32",145,4,0,0,"+8613800551500",145,28 This is a test from Quectel.

//Receive a new short message, directly output the content of the short message

9.14. AT+CSCB select cell broadcast message type

This command is used to select the type of CBM received by ME.

AT+CSCB select cell broadcast message type

test command

response

AT+CSCB=?

+CSCB: (list of supported <mode>s)

OK

query command

response

AT+CSCB?

+CSCB: <mode>,<mids>,<dcss>

OK

set command

response

AT+CSCB=<mode>,<mids>[,<dcss>]

OK

If the error is related to ME functionality:

+CMS ERROR: <err>

maximum response time

300 milliseconds

Feature Description

This command takes effect immediately;

the parameter configuration is automatically saved.

refer to

3GPP TS 27.005

parameter

<mode> Integer. Indicates whether to receive the message type specified by

<mids> and **<dcss>**. 0 accepts 1 does not accept string type. All possible combinations of CBM message identifiers (see **<mid>**). Such as

<mids> "0,1,5,320-478,922". String type. Combinations of all possible data encoding schemes. Such as "0-3,5" (see **<dcs>**).

<dcss> The default is an empty string. error code. refer to

<err>

No. 12.6 chapter

9.15. AT+CSDH set parameter display in text mode

This command is used to control whether to display detailed header information in the result code in text mode.

AT+CSDH set parameter display in text mode	
Test command AT+CSDH=?	response +CSDH: (list of supported <show>s)
	OK
query command AT+CSDH?	response +CSDH: <show>
	OK
set command AT+CSDH=<show>	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to	
3GPP TS 27.005	

parameter

<show>	Integer. <u>0</u> Do not display the following header information in the result code: For SMS-DELIVER and SMS-SUBMIT type short messages in text mode, the result codes of +CSCA and +CSMP do not contain <sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>; the result codes of +CMT, +CMGL and +CMGR do not contain <length>, <toda> or <tooa> 1 Display the header information in the result code
---------------------	--

example

```
AT+CSDH=0
OK
AT+CMGR=2
+CMGR: "STO UNSENT","","<This is a test from Quectel>
OK
AT+CSDH=1
```

```

OK
AT+CMGR=2
+CMGR: "STO UNSENT", "", 128, 17, 0, 0, 143, "+8613800551500", 145, 18
<This is a test from Quectel>
OK

```

9.16. AT+CSMP set short message text mode parameters

In text mode (AT+CMGF=1), when sending a short message to the network side or storing the short message in the memory, this command is used to set the additional parameter value. In addition, it can also be used to set the valid period from when the SMSC receives the short message (the value range of <vp> : 0~255) or define the absolute time when the valid period expires (when <vp> is a string).

AT+CSMP set short message text mode parameters

Test	response
command AT+CSMP=?	OK
query command	response
AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dcs>
	OK
set command	response
AT+CSMP=<fo>[,<vp>[,<pid>[,<dcs>]]]]	OK or ERROR
	If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to	
3GPP TS 27.005	

parameter

<fo> Integer. The first octet. Determined by command or result code. For details, refer to 3GPP TS 23.040 SMS-DELIVER,

The first octet of SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND. As long as a valid parameter value has been entered, the parameter can be omitted later. **<vp>** Integer or string type. expiration date. Depends on the setting of <fo> of SMS-SUBMIT , refer to 3GPP TS 23.040 TP-Validity-Period (refer to <dt>) for details. Default value: 167.

<pid> integer. protocol identifier. For details, refer to 3GPP TS 23.040 TP-Protocol-Identifier. Default value: 0.

<dcs> integer. Data encoding scheme. Depends on the command or result code: 3GPP TS 23.038 SMS Data Encoding Scheme (default Value: 0) or the cell broadcast data encoding scheme.

<err> Error code. refer to No. **12.6** chapter

9.17. AT+QCMGS send cascade short message

This command is used to send cascaded short messages. Different from **AT+CMGS**, when sending a concatenated short message through this command, each concatenated short message must be identified by additional parameters (**<uid>**, **<msg_seg>** and **<msg_total>**). When sending all short messages in segments, this command must be executed multiple times (set by **<msg_total>**). This command is only used in text mode (AT+CMGF=1).

AT+QCMGS send cascade short message

Test command	response OK
AT+QCMGS=? Set command text mode (AT+CMGF=1): AT+QCMGS=<da>[,<toda>] [,<uid>,<msg_seg>,<msg_total>]<CR> >Enter text Ctrl+Z to send/ESC to cancel sending	Response If in text mode (AT+CMGF=1) and the command is executed successfully: +QCMGS: <mr> OK or ERROR If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	120 seconds, determined by the network.
Feature Description	This command takes effect immediately; the parameter configuration is not saved.

parameter

<uid> Integer. Message ID in User Data Header (UDH). Range: 0~255. This parameter is defined and entered by the user. All fragments of the same concatenated message must use the same **<uid>**. Different cascade messages should use different **<uid>**. Integer. Concatenation message sequence number. Range: 0~7. **<msg_seg>=0**: Ignore this value and treat it as a non-concatenated message. Integer. The total number of segments for a concatenated message. Range: 0~7. **<msg_seg>=0** or **1**: ignore the value and treat it as a non-concatenated message. See **AT+CMGS**. See **AT+CMGS**.
<msg_total> See **AT+CMGS**. error code. refer to

<da>

<toda>

<mr>

<err>

No. **12.6** chapter

Remark

1. For concatenated short messages, the maximum length will be reduced to the length of the user datagram (UDH). 3GPP TS 23.040 defines two UDH lengths: 6 bytes and 7 bytes. Therefore, the two kinds of <uid> are 8 bits (6 bytes) and 16 bits (7 bytes). **AT+QCMGS** uses 8-bit <uid>. ÿ With the GSM 7-bit default alpha data encoding scheme, the maximum length of each segmented concatenated message is (140 octets - 6) × 8 / 7 = 153 characters. ÿ In case of 16-bit UCS2 data encoding scheme, the maximum length of each segmented concatenated message is (140 - 6) / 2 = 67 characters. ÿ In case of 8-bit data encoding scheme, the maximum length of each segmented concatenated message is 140 - 6 = 134 characters. 2. <mr> integer, located in the Message-Reference field, the reference number of SMS-SUBMIT or SMS-COMMAND sent by MS to SC, used to confirm whether SMS-DELIVER has been received from the SC copy. <uid> UDH field, the identifier of the concatenated short message. Different from <mr>, each segmented concatenated short message has the same <uid>, but <mr> must be incremented.

3. **AT+QCMGS** does not support sending messages in PDU mode (AT+CMGF=0).

example

```
AT+CMGF=1                                         //Set SMS mode to text mode
OK
AT+CSCS="GSM"                                     //Set character set to GSM used by TE
OK
AT+QCMGS="15056913384",120,1,2                  //Set <uid> to 120, and send the first cascading SMS //input
>ABCD                                              text. Ctrl+Z to send, ESC to cancel sending
+QCMGS: 190

OK
AT+QCMGS="15056913384",120,2,2                  // Send second paragraph of
>EFGH                                              cascading SMS // Enter text. Ctrl+Z to send, ESC to cancel sending
+QCMGS: 191

OK
```

9.18. AT+QCMGR read cascaded short message

The function of this command is similar to **AT+CMGR**, but this command reads a segmented concatenated message. After the command is executed, additional parameters will be returned : <uid>, <msg_seg> and <msg_total>. Depending on these three parameters, several segmented messages can be concatenated into the same message . This command is only used in text mode. (AT+CMGF=1)

AT+QCMGR read cascading short message

test command	response
AT+QCMGR=?	OK
set command	response

AT+QCMGR=<index>	If in text mode (AT+CMGF=1) and the command is executed successfully: For SMS-DELIVER: +QCMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pi>,<dcs>,<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]<CR><LF><data> OK For SMS-SUBMIT: +QCMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dc s>,<vp>],<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]<CR><LF><data> OK For SMS-STATUS-REPORT: +QCMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> OK For SMS-COMMAND: +QCMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR><LF><cdata > OK If the error is related to ME functionality: +CMS ERROR: <err>
maximum response time	Depends on message content length
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

parameter

<uid>	Integer. Message ID in the User Data Header (UDH). Range: 0~255. All fragments of the same concatenated message must use the same <uid>. Different cascade messages should use different <uid>.
<msg_seg>	Integer. Concatenation message sequence number. Range: 1~7.
<msg_total>	integer. The number of fragments for a concatenated message. Range: 2~7. For details of other parameters, see AT+CMGR .

<err> error code. refer to No. **12.6** chapter

Remark

1. The <uid> of AT+QCMGR is different from the <uid> of AT+QCMGS . The UE may receive an 8-bit or 16 -bit <uid> concatenation message interest. Therefore, its maximum value has two cases: 255 for 8 bits and 65535 for 16 bits.
2. If the read message is not a cascade message, <uid>, <msg_seg> and <msg_total> will not be displayed in the response result.

example

```
+CMTI: "SM",3          //Received the first segmented cascading message

+CMTI: "SM",4          //Received the second segmented cascading message

AT+QCMGR=3            //Read the first segmented cascading message
+QCMGR: "REC UNREAD", "+8615056913384", "18/12/20,14:44:37+32", 120,1,2
ABCD

OK

AT+QCMGR=4            //Read the second segmented cascading message
+QCMGR: "REC UNREAD", "+8615056913384", "18/12/20,14:44:37+32", 120,2,2
EFGH

OK
```

10 group field commands

10.1. AT+CGATT PS domain attach or detach

This setting command is used to attach MT to PS domain or separate MT from PS domain. After the command is completed, the MT remains in the V.250 command state. If the MT is already in request state, the command will be ignored and OK will still be responded. If the MT cannot achieve the requested state, it will respond with **ERROR** or **+CME ERROR**.

AT+CGATT PS domain attach or detach	
test command	response
AT+CGATT=?	+CGATT: (list of supported <state>s)
	OK
query command	response
AT+CGATT?	+CGATT: <state>
	OK
set command	response
AT+CGATT=<state>	OK or ERROR
	If the error is related to MT functionality: +CME ERROR: <err>
maximum response time	140 seconds, depending on network status
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to	
3GPP TS 27.007	

parameter

<state> Integer. PS Attachment status. 0 detached

state 1 attached state

Set other values as reserved values, and return **ERROR**
 after setting. <err> Error code. referNo. 12.5 chapter

example

```
AT+CGATT=1          //Attach to PS domain
OK
AT+CGATT=0          //Detach from PS domain
OK
AT+CGATT?           //Query the current PS domain status
+CGATT: 0
OK
```

10.2. AT+CGDCONT defines PDP context

This command specifies the PDP context parameters for the context identifier <cid>. A special form of the setting command **AT+CGDCONT=<cid>** means to delete the PDP context parameter corresponding to <cid>, making it undefined. Changing the definition of an activated context is not allowed. This query command returns the current configuration of each defined PDP context.

AT+CGDCONT defines PDP context

Test	response
command AT+CGDCONT=?	+CGDCONT: (supported <cid> range),<PDP_type>,<APN>,<PD P_addr>,(supported <data_comp> range),(supported <head_com p> range),(supported <Pv4AddrAlloc> list),(supported <request_type> range), (supported <P-CSCF_discovery> range),(Supported <IM_ CN_Signalling_Flag_Ind> list)
	OK
query command	
AT+CGDCONT?	Response +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>[...]
	OK
set command	response
AT+CGDCONT=<cid>[,<PDP_type>[,< APN>[,<PDP_addr>[,<data_comp>[,<head_comp>[,<Pv4AddrAlloc>[,<request t_type>[,<P-CSCF_discovery>[,<IM_C N_Signalling_Flag_Ind>]]]]]]]]]	OK or ERROR
maximum response time	3 seconds

<p>Feature Description</p> <p>Refer to 3GPP TS 27.007</p>	<p>This command takes effect immediately. the parameter configuration is automatically saved.</p>
---	---

parameter

<cid> Integer. PDP context identifier, used to specify the definition of a specific PDP context. Range: 1~15. This parameter is a local parameter of the TE-MT interface and is used in other commands related to the PDP context. The range of allowed values is returned by the test command (minimum is 1).

<PDP_type> string type. Specifies the packet data protocol type. Internet

- "IP" Protocol Version 4 (IETF STD 5) Point-to-
- "PPP" Point Protocol (IETF STD 51)
- "IPV6" Internet Protocol Version 6 "IPV4V6"

introduces a virtual <PDP_type> string type to handle dual IP stack UE capabilities.

<APN> Access Point Name, used to select the logical name of the GGSN or external packet data network. If the value is empty or omitted, the subscription value will be used.

<PDP_addr> String type. Used to identify the MT in the address space applicable to the PDP. If the value is empty or omitted, the TE shall provide this value during PDP startup, otherwise, a dynamic address shall be requested. The assigned address can be read using **AT+CGPADDR**. **<data_comp>** integer. Controls whether PDP data needs to be compressed.

(only for SNDCP) (for details, please refer to 3GPP

TS 44.065) 0

off (default if omitted) 1 on (manufacturer

specified)

2 V.42bis

3 V.44 (not currently supported)

<head_comp> integer. Controls PDP header data compression. (For details, please refer to 3GPP TS 44.065 and 3GPP TS 25.323)

0 off (default if omitted) 1 on

2 RFC1144

3 RFC2507

4 RFC3095

<Pv4AddrAlloc> integer. Controls how MT/TA requests IPv4 address information

0 Obtain IPv4 address through NAS signaling

1 Obtain IPv4 address through DHCP

<request_type> integer. Context activation request type for the PDP context. See 3GPP TS 24.301 (subclause 6.5.1.2) and 3GPP TS

24.008 (subclause 10.5.6.17). If the initial PDP context (subclause 10.1.0) is supported, assignment of **<cid>=0** for emergency bearer services is not allowed. According to 3GPP TS 24.008 (subclause 4.2.4.2.2 and 4.2.5.1.4) and 3GPP TS 24.301 (subclause 5.2.2.3.3 and 5.2.3.2.2), a separate PDP context must be established for emergency bearer services.

<P-SCF_discovery> integer. Control the way MT/TA obtains P-CSCF address, please refer to 3GPP TS 24.229 annex B and annex L for details.

- 0 Not affected by **AT+CGDCONT** 1 Prioritized
 to obtain through NAS signaling 2 Prioritized
 to obtain through DHCP

<IM_CN_Signalling_Flag_Ind> integer. Indicates to the network whether the PDP context is only used for signaling related to the IM CN subsystem.

- 0 UE indicates that the PDP context is only used for IM CN subsystem related signaling 1
- UE indicates that the PDP context is only used for IM CN subsystem related signaling

10.3. AT+CGQREQ Quality of Service Parameters (Requested)

This command allows the MT to specify a QoS profile when the MT activates the PDP context.

The set command specifies the configuration file for context <cid>. A special form of the set command **AT+CGQREQ=<cid>** leaves the parameter requested by the context identifier <cid> in an undefined state. The query command returns the current configuration for each defined context. Please refer to 3GPP TS 23.107 for details .

AT+CGQREQ Quality of Service Parameters (Requested)

test command	response
AT+CGQREQ=?	+CGQREQ: <PDP_type>, (supported <precedence> range), (supported <delay> range), (supported <reliability> range), (supported <peak> range), (supported <mean> list)
	OK
query command	
AT+CGQREQ?	Response [+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>] [+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>] [...]
	OK
set command	response
AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]	OK or ERROR If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.

refer to

3GPP TS 27.007

parameter

<cid> Integer. Definition of a specific PDP context. (For details, please refer to **AT+CGDCONT**)

<PDP_type> string type. Specifies the packet data protocol type. Internet

"IP" Protocol Version 4 (IETF STD 5) Point-to-

"PPP" Point Protocol (IETF STD 51)

"IPV6" Internet Protocol Version 6

"IPV4V6" introduces virtual <PDP_type> to handle dual IP stack UE function

<precedence> integer. priority level. 0 Network

subscription value 1

High priority. Service priority 2 normal priority before priority 2 and 3.

The service priority is lower than the priority level 3. Continue to maintain service integrity. Latency category. This parameter defines

<delay> the end-to-end transmission delay that occurs when the SDU is transmitted over the network. For details, please refer to the integer type of 0 network subscription value **<reliability>**. Depends on grade. 0 Network Subscription Value 1 Unable to address data loss non-real-time traffic and error-sensitive applications 2 Able to address infrequent data loss non-real-time traffic and error-sensitive applications 3 Able to address data loss, GMM/SM and SMS Non-real-time traffic and error-sensitive applications 4. Real-time traffic and error-sensitive applications that can solve data loss.

5. Real-time traffic that can solve data loss and error-insensitive applications. Peak throughput class in octets per second. 0 Network subscription value 1 up to 1 000 (8 kbit/s) 2 up to 2 000 (16 kbit/s) 3 up to 4 000 (32 kbit/s) 4 up to 8 000 (64 kbit/s) 5 up to 16 000 (128 kbit/s) 6 up to 32 000 (256 kbit/s) 7 up to 64 000 (512 kbit/s) 8 up to 128 000 (1024 kbit/s) 9 up to 256 000 (2048 kbit/s) Integer. Average throughput class. Measured in octets per hour. 0 Network subscription value 1 100 (about 0.22 bit/s) 2 200 (about 0.44 bit/s) 3 500 (about 1.11 bit/s) 4 1

<peak> 000 (about 2.2 bit/s)

—

<mean>

—

5 2 000 (about 4.4 bit/s) 6 5 000
 (about 11.1 bit/s) 7 10 000 (about
 22 bit/s) 8 20 000 (about 44 bit/s)
 9 50 000 (about 111 bit/s) 10 100
 000 (about 0.22 kbit/s) 11 200 000
 (about 0.44 kbit/s) 12 500 000 (about
 1.11 kbit/s) 13 1000 000 (about 2.2
 kbit/s) 14 2 000 000 (about 4.4 kbit/s)
 15 5 000 000 (about 11.1 kbit/s) 16 10
 000 000 (about 22 kbit/s) 17 20 000
 000 (about 44 kbit/s) 18 50 000 000
 (about 111 kbit/s)

31 Best effort

<err>

error code. refer toNo. **12.5** chapter

Table 5: Latency categories

SDU size	delay category	average transfer delay	95%
128 octets	1 (forecast)	< 0.5	< 1.5
	2 (forecast)	< 5	< 25
	3 (forecast)	< 50	< 250
	4 "Best effort"	not specified	-
1024 octets	1 (forecast)	< 0.5	< 1.5
	2 (forecast)	< 5	< 25
	3 (forecast)	< 50	< 250
	4 "Best effort"	not specified	-

10.4. AT+CGQMIN Quality of Service Parameters (Minimum Acceptable)

This command allows the TE to specify the minimum acceptable configuration file parameters, which are checked by the MT against the negotiated parameters when activating the PDP context.

The minimum acceptable profile. Set command parameters for the context identified by the specified context identifier <cid>.

A special form of the set command, AT+CGQMIN=<cid>, leaves the minimum acceptable profile for context identifier <cid> undefined, and no checks will be made for the negotiated profile. The query command returns the current configuration of each defined PDP context. Please refer to 3GPP TS 23.107 for details.

AT+CGQMIN QoS parameters (minimum acceptable)

test command	response
AT+CGQMIN=?	+CGQMIN: <PDP_type>, (supported <precedence> range), (supported <delay> list), (supported <reliability> range), (supported <peak> range), (supported <mean> list)
	OK
Query	
command AT+CGQMIN?	Response [+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>] [+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>] [...]
	OK
set command	response
AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]	OK or ERROR
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to	
3GPP TS 27.007	

parameter

<cid> Integer. Definition of a specific PDP context. (For details, please refer to **AT+CGDCONT**)

<PDP_type> string type. Specifies the packet data protocol type. Internet

"IP" Protocol Version 4 (IETF STD 5) Point-to-Point

"PPP" Protocol (IETF STD 51)

"IPV6" Internet protocol version 6 "IPV4V6"

introduces virtual <PDP_type> to handle dual IP stack UE function <precedence>

integer. priority level. 0 network subscription value

1 has high priority. Service priority 2 normal priority before priority 2 and 3. The service priority is lower than the priority level 3. Continue to maintain service integrity. Latency category. This parameter defines

<delay> the end-to-end transmission delay that occurs when the SDU is transmitted over the network. Please refer to 5 for details. Peak throughput class in octets per second. 0 Network subscription value 1 up to 1 000 (8 kbit/s) 2 up to 2 000 (16 kbit/s) 3 up to 4 000 (32 kbit/s) 4 up to 8 000 (64 kbit/s) 5 up to 16 000 (128 kbit/s) 6 up to 32 000 (256 kbit/s) 7 up to 64 000 (512 kbit/s) 8 up to 128 000 (1024 kbit/s) 9 up to 256 000 (2048 kbit/s) Integer. Average throughput class. Measured in octets per hour. 0 Network subscription value 1 100 (about 0.22 bit/s) 2 200 (about 0.44 bit/s) 3 500 (about 1.11 bit/s) 4 1 000 (about 2.2 bit/s) 5 2 000 (about 4.4 bit/s) 6 5 000 (about 11.1 bit/s) 7

<peak> 10 000 (about 22 bit/s) 8 20 000 (about 44 bit/s) 9 50 000 (about 111 bit/s) 10 100 000 (about 0.22 kbit/s) 11 200 000 (about 0.44 kbit/s) 12 500 000 (about 1.11 kbit/s) 13 1000 000 (about 2.2 kbit/s) 14 2 000 000 (about 4.4 kbit/s) 15 5 000 000 (about 11.1 /s) 16 10 000 000 (about 22 kbit/s) 17 20 000 000 (about 44 kbit/s) 18 50 000 000 (about 111 kbit/s)

<mean>

—

31 Best effort

<err> error code. refer toNo. 12.5 chapter

10.5. AT+CGEQREQ 3G QoS parameter (requested)

This command allows the TE to specify a UMTS QoS profile for the MT to activate a PDP context. For details, please refer to 3GPP TS 23.107.

AT+CGEQREQ 3G quality of service parameter (requested)

Test

command **AT+CGEQREQ=?**

response

+CGEQREQ: <PDP_type>, (supported <Traffic class> range), supported <Maximum bitrate UL> list), (supported <Maximum bitrate DL> List), (Supported <Guaranteed bitrate UL> List), (Supported <Guaranteed bitrate DL> list), (supported <Delivery order> range), (supported <Maximum SDU size> list), (supported <SDU error ratio> list), (supported <Residual bit error ratio> list), (supported <Delivery of erroneous SDUs> range), (supported <Transfer delay> list), (supported <Traffic handling priority> range), (supported <Source statistics descriptor> range), (supported <Signalling indication> list)

OK

query command

AT+CGEQREQ?

Response [+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum S DU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signalling indication>]
[...]

OK

set command

AT+CGEQREQ=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum m bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit err or ratio>[,<Delivery of erroneous S DUs>[,<Transfer delay>[,<Traffic han

response

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

dling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]]]]]]]]]]]

maximum response time	300 milliseconds
-----------------------	------------------

Feature Description	This command takes effect immediately; the parameter configuration is not saved.
---------------------	---

refer to	
----------	--

3GPP TS 27.007	
----------------	--

parameter

<c cid > Integer. PDP context identifier, which defines a specific PDP context. This parameter is a local parameter of the TE-MT interface and is used in other commands related to the PDP context. The range of allowed values is returned by the test command (minimum is 1). String type. Specifies the packet data protocol type.

"IP" Internet Protocol Version (IETF STD 5 [103]) Point-to-

"PPP" Point Protocol (IETF STD 51)

"IPV6" Internet Protocol Version 6

"IPV4V6" introduces virtual <PDP_type> to handle dual IP stack UE function

For the definition of the following parameters, please refer to 3GPP TS 23.107.

<Traffic class> Integer. UMTS bearer service optimized application type (see 3GPP TS 24.008 subclause 10.5.6.5). If this parameter is specified as session service or streaming service, **<Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL> and <Guaranteed bitrate DL> should be specified**. Conversational services, streaming media services, interactive services, background

0 services, and subscription values are integers. In one SAP, the maximum

1 upstream bit rate (unit: kbit/s). The bit rate of 32kbit/s is 32 (such as

2 AT+CGEQREQ=...,32,...). Range: 0~256000.

3

4

<Maximum bitrate UL>

0	subscription value
---	--------------------

—	
---	--

0~64	
------	--

64~568	(The value must be a multiple
--------	-------------------------------

568~8640	of 8) (The value must be a
----------	----------------------------

8640~16000	multiple of 64) (The value must
------------	---------------------------------

must be a multiple of 1000) 16000~ 162800011256001256000 (The value	must be a multiple of 2000) Integer. In one SAP, the maximum
--	--

<Maximum bitrate DL> downlink bit rate (unit: kbit/s). The bit rate of 32kbit/s is 32 (such as AT+CGEQREQ=...,32,...).

Range: 0~256000.

0	subscription value
---	--------------------

—	
---	--

0~64

64~568 (The value must be a multiple

multiple of 64) 568~8640 8640~16000 (The value must be a

be a multiple of 100) 16000~128000 (The value must be a
multiple of 1000) 128000~256000 (The value must be a
multiple of 2000 Multiple) Integer. In one SAP (as long asthere is data transmission), the uplink can guarantee the bit rate (unit: kbit/s). For
example: the bit rate of 32kbit/s is 32 (such as**AT+CGEQREQ=...,32,...).** Range: 0~256000. subscription

— value 0

0~64

64~568 (The value must be a multiple

multiple of 64) 568~8640 8640~16000 (The value must be a
be a multiple of 100) 16000~128000 (The value must be a
multiple of 1000) 128000~256000 (The value must be a
multiple of 2000 Multiple) Integer. In one SAP (as long as<Guaranteed bitrate UL>
there is data transmission), the downlink can guarantee the bit rate (unit: kbit/s). For
example: the bit rate of 32kbit/s is 32 (such as**AT+CGEQREQ=...,32,...).** Range: 0~256000. subscription

— value 0

0~64

64~568 (The value must be a

must be a multiple of 64) 568~8640 8640~16000 (The
value must be a multiple of 100) 16000~128000 (The
value must be a multiple of 1000) 128000~256000 (The
value must be a multiple of 2000 Multiple) Integer. Indicates<Delivery order>
whether the UMTS bearer sends SDUs in order (see 3GPP TS 24.008 subclause
10.5.6.5)

0 Non-

1 sequential

2 and<Maximum SDU size>
sequential subscription value integer. (1, 2, 3, ...). Maximum SDU length allowed in
octet format. 0 means request subscription value. (See 3GPP TS 24.008 subclause 10.5.6.5).**0** Subscription

10~520 value (this value must be a multiple of 10)

1520

<SDU error ratio>
String type. Indicates the lost or detected SDU bit error rate target value. SDU Bit Error Rate
is only defined for compliant traffic. The value is specified as "mEe". Example: If the target
SDU error rate is 5×10^{-3} , it can be set to "5E3" (eg**AT+CGEQREQ=...,"5E3",...).** subscription**"0E0"** value**"1E1"****"1E2"****"7E3"**

<err>

error code. refer to No. 12.5 chapter

10.6. AT+CGEQMIN 3G QoS parameters (minimum acceptable)

This command allows the TE to specify the minimum acceptable parameters, which will be checked by the MT based on the negotiation parameters returned during the establishment and modification of the PDP context. Please refer to 3GPP TS 23.107 for details.

AT+CGEQMIN 3G service quality parameters (minimum acceptable)

Test

command **AT+CGEQMIN=?**

response

+CGEQMIN: <PDP_type>, (supported <Traffic class> range), (supported <Maximum bitrate UL> range), (supported <Maximum bitrate UL > DL>Range),(Supported <Guaranteed bitrate UL>Range),(Supported <Guaranteed bitrate DL> range), (supported <Delivery order> range), (supported <Maximum SDU size> list), (supported <SDU error ratio> list), (supported <Residual bit error ratio> list), (supported <Delivery of erroneous SDUs> range), (supported <Transfer delay> list), (supported <Traffic handling priority> range), (supported <Source statistics descriptor> list), (supported <Signalling indication> list)

OK

Query

command **AT+CGEQMIN?**

response

[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate U L>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SD U size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication>]

[...]

OK

set command

AT+CGEQMIN=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate U L>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SD Us>[,<Transfer delay>[,<Traffic hand

response

OK

or

ERROR

If the error is related to ME functionality:

+CME ERROR: <err>

ling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]]]]]]]]]	
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to 3GPP TS 27.007	

Parameter

<cid>	Integer. PDP context identifier, which defines a specific PDP context. This parameter is a local parameter of the TE-MT interface and is used in other commands related to the PDP context. The range of allowed values is returned by the test command (minimum is 1). String type. Specifies the packet data protocol type.	
<PDP_type>	<p>"IP" Internet Protocol Version (IETF STD 5 [103]) Point-to-Point Protocol (IETF STD 51)</p> <p>"PPP"</p> <p>"IPV6" Internet Protocol Version 6</p> <p>"IPV4V6" introduces virtual <PDP_type> to handle dual IP stack UE function</p>	
For the definition of the following parameters, please refer to 3GPP TS 23.107.		
<Traffic class>	<p>Integer. UMTS bearer service optimized application type (see 3GPP TS 24.008 subclause 10.5.6.5).</p> <p>If this parameter is specified as session service or streaming service, <Maximum bitrate UL>, <Maximum bitrate DL>, <Guaranteed bitrate UL> and <Guaranteed bitrate DL> should be specified.</p> <p>Conversational service Streaming media service Interactive service Background service</p>	
0	subscription value 4 Integer. In one SAP, the maximum upstream bit rate (unit: kbit/s). The bit rate of 32kbit/s is 32 (such as AT+CGEQREQ=...,32,...). Range: 0~256000.	
1		
2		
3		
—		
<Maximum bitrate UL>		
—		
0	subscription value	
—		
0~64		
64~568	(The value must be a multiple of 8) (The value must be a	
568~8640		
8640~16000	multiple of 64) (The value must be a multiple of 100) (The value	
16000~128000		
must be a multiple of 1000) 128000~256000 (The value must be a multiple of 2000) Integer. In one SAP, the maximum downlink bit rate (unit: kbit/s). The bit rate of 32kbit/s is 32 (such as AT+CGEQREQ=...,32,...). Range: 0~256000.		
<Maximum bitrate DL>		

0~64
 64~568 (The value must be a multiple
 multiple of 64) 568~8640 8640~16000 (The value must
 be a multiple of 100) 16000~128000 (The value must be a
 multiple of 1000) 128000~256000 (The value must be a
 multiple of 2000 Multiple) Integer. In one SAP (as long as
 there is data transmission), the uplink can guarantee the bit rate (unit: kbit/s). For
 example: the bit rate of 32kbit/s is 32 (such as

AT+CGEQREQ=...,32,...). Range: 0~256000. subscription

— value 0
 —
 0~64
 64~568 (The value must be a multiple
 multiple of 64) 568~8640 8640~16000 (The value must
 be a multiple of 100) 16000~128000 (The value must be a
 multiple of 1000) 128000~256000 (The value must be a
 multiple of 2000 Multiple) Integer. In one SAP (as long as

<Guaranteed bitrate DL>
 there is data transmission), the downlink can guarantee the bit rate (unit: kbit/s). For
 example: the bit rate of 32kbit/s is 32 (such as

AT+CGEQREQ=...,32,...). Range: 0~256000. subscription

— value 0
 —
 0~64
 64~568 (The value must be a
 must be a multiple of 64) 568~8640 8640~16000 (The
 value must be a multiple of 100) 16000~128000 (The
 value must be a multiple of 1000) 128000~256000 (The
 value must be a multiple of 2000 Multiple) Integer. Indicates

<Delivery order>
 whether the UMTS bearer sends SDUs in order (see 3GPP TS 24.008 subclause
 10.5.6.5)

0 Non-
 1 sequential
2 and

<Maximum SDU size>
 sequential subscription value integer. (1, 2, 3, ...). Maximum SDU length allowed in
 octet format. 0 means request subscription value. (See 3GPP TS 24.008 subclause 10.5.6.5).

0 Subscription
10~520 value (this value must be a multiple of 10)
 1520

<SDU error ratio>
 String type. Indicates the lost or detected SDU bit error rate target value. SDU bit error rate
 Defined only for eligible traffic. The value is specified as "mEe". Example: If the target
 SDU error rate is 5×10^{-3} , it can be set to "5E3" (eg

AT+CGEQREQ=...,"5E3",...). subscription

"0E0" value
"1E2"
 "7E3"
 "1E3"

"1E4"
 "1E5"
 "1E6"
 "1E1"

<Residual bit error ratio>

String type. Indicates the target value for the undetected bit error rate in transmitted SDUs. If no error detection is requested, the residual BER represents the BER in the transmitted SDUs. The value is specified as "mEe". For example: if the target residual bit error rate is 5×10^{-3} , set it to "5E3" (for example, **AT+CGEQREQ=..., "5E3", ...**) "OE0" subscription value
 "5E2"
 "1E2"
 "5E3"
 "4E3"
 "1E3"
 "1E4"
 "1E5"
 "1E6"
 "6E8"

<Delivery of erroneous SDUs> Integer. Indicates whether to send SDUs for detected errors. (see 3GPP TS 24.008 subclause 10.5.6.5).

<u>0</u>	Do not
1	send
2	Send
<u>3</u>	undetected

<Transfer delay>

subscription value integer. (0, 1, 2, ...). Indicates the target time for transferring the SDU request from one SAP to another SAP. Unit: milliseconds. If the parameter is set to 0, the subscription value will be requested (see 3GPP TS 24.008 subclause 10.5.6.5). Subscription must be a multiple of 500 (the value must be a multiple of 100) 2009050112:30:00. Priority in handling all SDUs belonging to a UMTS bearer compared to SDUs of other bearers. If the parameter is set to 0, the subscription value will be requested (see

<Traffic handling priority>

3GPP TS 24.008 subclause 10.5.6.5).

<u>0</u>	subscription value
1	
2	
3	

<Source statistics descriptor> integer. Specifies the characteristics of the SDU submitted by the PDP context. 0 Unknown SDU characteristic 1 SDU characteristic integer based on source language. Specifies the signaling content of the SDU submitted**<Signalling indication>**

0 PDP context is not optimized for signaling 1
 PDP context is optimized for signaling

<err> error code. refer to No. 12.5 chapter

10.7. AT+CGACT PDP context activation/deactivation

This set command is used to activate or deactivate the specified PDP context. After the command setting is completed, the MT maintains the V.250 command status. If any PDP context has entered the request state, then the context state remains unchanged; when executing the activate command, if the MT is not attached PS, the MT will perform PS attachment first, and then try to activate the specified context. If no <cid> is specified to activate or deactivate the command, all defined contexts will be activated or deactivated.

AT+CGACT PDP context activation/deactivation

test command

AT+CGACT=?

response

+CGACT: (list of supported <state>s)

OK

query command

AT+CGACT?

Response +CGACT: <cid>,<state>[<CR><LF>

+CGACT: <cid>,<state>...]

OK

set command

AT+CGACT=<state>,<cid>

response

OK

or

ERROR

In case of errors related to ME functions:

+CME ERROR: <err>

maximum response time

150 seconds, depending on network status

Feature Description

This command takes effect immediately;

the parameter configuration is not saved.

refer to

3GPP TS 27.007

parameter

<state> Integer. PDP context activation status.

0 Deactivate 1

Activate Other

values in the setting command are reserved values, and will return ERROR after setting.

<cid> Integer. Specifies the definition of the PDP context. (For details, please refer to **AT+CGDCONT**).

<err> Error code. refer to

No. 12.5 chapter

example

```
AT+CGDCONT=1,"IP","UNINET" //Define the PDP context
OK
AT+CGACT=1,1 //activate PDP
OK
AT+CGACT=0,1 //Deactivate PDP
OK
```

10.8. AT+CGDATA enters data transmission state

After executing the setup command, the MT will operate using one or more packet domain PDP types to establish communication between the TE and the network, which may also include PS attach and one or more PDP context activation operations. MT will not process commands after **AT+CGDATA** in the AT command line .

If MT cannot receive the value of <L2P>, it will return **ERROR** or **+CME ERROR**. If it can be received, MT will return the intermediate result code **CONNECT** and enter the state of V.250 online data transmission. After the data transfer is complete and the Layer 2 protocol termination procedure has been successfully completed, the command state will be re-entered and the MT will return a final result code of **OK**.

AT+CGDATA enters data transmission state	
test command	response
AT+CGDATA=?	+CGDATA: (list of supported <L2P>s)
	OK
Set	response
command AT+CGDATA=<L2P>[,<cid>[,<cid>[,...]]]	CONNECT or ERROR
	In case of errors related to ME functions: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/
refer to	
3GPP TS 27.007	

parameter

<L2P>	String type. Layer 2 protocol used between TE and MT.
PPP	PDP Point-to-Point Protocol (e.g. IP)
Other values are not supported. If configured to other values, ERROR will be returned.	

<cid>	Integer. Definition of a specific PDP context. (For details, please refer to AT+CGDCONT)
<err>	Error code. refer to No. 12.5 chapter

10.9. AT+CGPADDR display PDP address

This set command returns a list of PDP addresses for the specified context identifier. If <cid> is not specified, returns the location of all defined contexts site.

AT+CGPADDR display PDP address

test command	response
AT+CGPADDR=?	+CGPADDR: (list of supported defined <cid>s)

OK

Set	
command AT+CGPADDR[=<cid>[,<cid>[,...]]]	Response +CGPADDR: <cid>,<PDP_addr> [+CGPADDR: <cid>,<PDP_addr>[...]]

OK

or

ERROR

maximum response time	300 milliseconds
-----------------------	------------------

Feature Description	/
---------------------	---

refer to	
3GPP TS 27.007	

parameter

<cid>	Integer. Definition of a specific PDP context. (For details, please refer to AT+CGDCONT).
<PDP_addr>	String type. PDP address, used to identify the TE in the address space applicable to the PDP. The address can be static or dynamic: the static address is set by AT+CGDCONT when defining the context . Dynamic addresses were assigned during the last PDP context activation (defined using the context specified by <cid>). <PDP_addr> is omitted if no address is available.

example

AT+CGDCONT=1,"IP","UNINET"	//Define the PDP context
-----------------------------------	--------------------------

OK

AT+CGACT=1,1	//activate PDP
---------------------	----------------

OK

```
AT+CGPADDR=1 //Display PDP address
```

```
+CGPADDR: 1,"10.76.51.180"
```

```
OK
```

10.10. AT+CGCLASS GPRS mobile station level

This command makes MT operate according to the specified operation mode. Please refer to *3GPP TS 23.060 for details.*

AT+CGCLASS GPRS mobile station level	
Test command AT+CGCLASS=?	response +CGCLASS: (list of supported <class>s) OK
query command AT+CGCLASS?	response +CGCLASS: <class> OK
set command AT+CGCLASS=<class>	response OK or ERROR If the error is related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.
Refer to 3GPP TS 27.007	

parameter

<class> String type. GPRS mobile class (features in descending order) Class-A mode

"A" of operation (A/Gb mode) or CS/PS mode of operation (Iu mode) (most advanced mode of operation)

<err> Error code. refer to

No. **12.5** chapter

10.11. AT+CGREG PS domain network registration status

This command is used to query the registration status of the PS domain network and control the reporting of non-requested result codes:

ÿ When <n>=1 , control the reporting of URC +CGREG: <stat>, this URC indicates the change of the PS domain network registration status. ÿ

When <n>=2 , control the reporting of URC +CGREG: <stat>[,<lac>,<ci>[,<AcT>]], the URC indicates the network of the PS domain changes in the neighborhood.

AT+CGREG PS domain network registration status	
test command AT+CGREG=?	response +CGREG: (supported <n> ranges) OK
Query command AT+CGREG?	response +CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] OK
set command AT+CGREG[=<n>]	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .
refer to 3GPP TS 27.007	

parameter

<n>	Integer. Control the reporting of the specified URC. 0 Disable reporting network registration URC 1 Allow reporting network registration URC +CGREG: <stat> 2 Allow reporting network registration and location information URC: +CGREG: <stat>[,<lac>,<ci>[,<AcT>]] <stat> integer.
-----	--

Network registration status.

0 is not registered. MT is not currently searching for a carrier to register with. The UE is in GMM state GMM-NUL or GMM-DEREGISTERED-

INITIATED. Network services are disabled, but users are allowed to request attachment Network 1 is registered, the home network. The UE is in the GMM state GMM-REGISTERED of the home PLMN or
GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED

2 Not registered, but the MT is currently trying to attach or search the network for registration. UE is in GMM state

GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The network service is enabled, but the allowed PLMN is currently unavailable. The UE shall start attaching to the network when an allowed PLMN is available. 3 Registration rejected. The UE is in GMM state GMM-NUL. The network service is disabled and the user request is not allowed

attached

network 4

unknown 5 registered,

roaming state <lac> string type. Two-byte location area code in hexadecimal format (for example: "00C3" is equivalent to 195 in decimal).

<ci> String type. 16-bit (GSM) or 28-bit (UMTS/LTE) cell ID in hexadecimal format.

<AcT> integer. A network format has been selected.

0 GSM

2UTRAN

3 GSM W/EGPRS

4 UTRAN W/HSDPA

5 UTRAN W/HSUPA

6 UTRAN w/HSDPA and HSUPA

7 E-UTRAN

example

```
AT+CGREG=2
OK
AT+CGATT=0
OK

+CGREG: 2
AT+CGATT=1
OK

+CGREG: 1,"D504","80428B5",7
```

10.12. AT+CGEREP packet domain event reporting

This set command enables/disables sending of unsolicited result codes from MT in case of certain events occur in packet domain MT or network +CGEV: XXX to TE. <mode> controls the flow of unsolicited result codes specified by this command. When <mode>=1 or 2 , <bfr> controls the proactive reporting behavior policy of the cache.

AT+CGEREP packet domain event reporting	
Test	response
command AT+CGEREP=?	+CGEREP: (list of supported <mode>s), (list of supported <bfr>s)
	OK
query command	response
AT+CGEREP?	+CGEREP: <mode>,<bfr>



	OK
set command AT+CGEREP=<mode>[,<bfr>]	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to 3GPP TS 27.007	

parameter

<mode> integer. Controls the handling of unsolicited result codes specified in this command.

0 Cache the unsolicited result codes in the MT; if the MT result code cache is full, the earliest unsolicited result codes will be discarded. Result codes will not be forwarded to TE 1 When the link between MT-TE is occupied (for example: in online data mode), unsolicited result codes are discarded. Otherwise, straight

Receive and forward to TE

2 When the link between MT-TE is occupied (for example: in online data mode), cache the unsolicited result codes in MT, and send all cached unsolicited result codes to TE when the link is available. Otherwise, forward directly to TE

<bfr> Integer. Control caching code.

0 When **<mode>** is 1 or 2, the MT cache of unsolicited result codes defined by this command is cleared. 1 When **<mode>** is 1 or 2, the MT buffer of the unsolicited result code defined in this command is sent to the TE (return **OK** to send).

Remark

The non-request result codes and their corresponding events

are defined as follows: 1. **+CGEV: REJECT <PDP_type>,<PDP_addr>**: When MT fails to pass the non-request result code +CRING to convert the PDP context

When the activation event is reported to the TE and the MT is automatically rejected, it will request the network to activate the

PDP context. Note: This event does not apply to EPS.

2. **+CGEV: NW REACT <PDP_type>,<PDP_addr>,[<cid>]**: The network has requested context reactivation. If known by the MT, the **<cid>** used to reactivate the context will be provided. Note: This event does not apply to EPS.

3. **+CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The network forcefully deactivates the context. If **<cid>** is known by the MT, it will provide the **<cid>** used to activate the context.

4. **+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The mobile terminal has forcibly deactivated the context. If known by the MT, it will provide the **<cid>** used to activate the context.

5. **+CGEV: NW DETACH**: The network has forcibly deattached the packet field, indicating that all activated contexts have been deactivated. deactivate Live contexts are not reported separately.

6. **+CGEV: ME DETACH**: The mobile terminal has forcibly detached the packet field, indicating that all activated contexts have been deactivated.

Deactivated contexts are not reported separately.

7. **+CGEV: NW CLASS <class>**: The network has forcibly changed the MS class, and reported the highest available class. (For details, please refer to **AT+CGCLASS**).
8. **+CGEV: ME CLASS <class>**: The mobile terminal has forcibly changed the MS class and reported the highest available class. (For details, please refer to **AT+CGCLASS**).
9. **+CGEV: PDN ACT <cid>**: Activated context. This context represents a PDN connection for LTE or the first PDP context.
10. **+CGEV: PDN DEACT <cid>**: Deactivate the context. This context represents the PDN connection for LTE or the first A PDP context.

example

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

OK

AT+CGEREP?
+CGEREP: 0,0

OK
```

10.13. AT+CGSMS select MO short message service

This command is used to specify the service or preferred service used by MT to send MO (Mobile Terminal) short messages.

AT+CGSMS select MO short message service	
test command AT+CGSMS=?	response +CGSMS: (list of currently available <service>s) OK
query command AT+CGSMS?	response +CGSMS: <service> OK
set command AT+CGSMS=[<service>]	response OK If the error is related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is automatically saved.

refer to
3GPP TS 27.007

parameter

<service> integer. Services used or preferred services.

- 0 GPRS
 - 1 Circuit interactive data format
 - 2 Preferably GPRS (use circuit interactive data format when GPRS is unavailable)
 - 3 Preferred circuit interactive data format (use packet field when circuit interactive data format is unavailable)
- <err>** Error code . refer to No. **12.5** chapter

10.14. AT+CEREG EPS network registration status

This command is used to query the network registration status and control the reporting of unsolicited result codes of the network registration status.

- ÿ When **<n>=1** , control the reporting of URC **+CEREG: <stat>**, the URC indicates the EPS network registration of MT in E-UTRAN state change.
- ÿ When **<n>=2** , control the reporting of URC **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]**. This URC indicates the change of the network cell in E-UTRAN.

AT+CEREG EPS network registration status	
test command AT+CEREG=?	response +CEREG: (list of supported <n>s) OK
query command AT+CEREG?	response +CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]] OK
set command AT+CEREG[=<n>]	response OK or ERROR
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration will be saved after executing AT&W .
Refer to 3GPP TS 27.007	

parameter

<n>	Integer. Controls the display of unsolicited result codes. 0 Disable reporting network registration URC 1 Allow reporting network registration URC +CEREG: <stat> 2 Allow reporting network registration and location information URC +CEREG: <stat>[,<tac>,<ci>[,<AcT>]]
<stat> integer.	EPS registration status. 0 is not registered. MT currently has no operators to register with. 1 Registered, home network. 2 Not registered, but the MT is currently trying to attach or search the network for registration. 3 Registration rejected. 4 Unknown. 5 Registered, roaming status.
<tac>	String type. The two-byte location area code in hexadecimal format.
<ci>	String type. 28 bytes (E-UTRAN) cell ID in hexadecimal format.
<AcT> integer.	The access technology of the registration network. 0 GSM 2UTRAN 3 GSM W/EGPRS 4 UTRAN W/HSDPA 5 UTRAN W/HSUPA 6 UTRAN W/HSDPA and HSUPA 7 E-UTRAN

10.15. AT+QGDCNT traffic statistics

This command is used to query the number of bytes sent or received by the module.

AT+QGDCNT traffic statistics	
test command AT+QGDCNT=?	response +QGDCNT: (list of supported <op>s) OK
query command AT+QGDCNT?	response +QGDCNT: <bytes_sent>,<bytes_recv> OK
set command AT+QGDCNT=<op>	response OK or ERROR

	If the error is related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	/

parameter

<op>	Integer. Data operation type. 0 Reset data 1 Save the data result to NV, if you need to save the result automatically, please refer to AT+QAUGDCNT .
<bytes_sent>	Integer. Send traffic size. Integer. Receive flow size. error code. refer to
<bytes_recv>	

<err> No. **12.5** chapter

Remark

Load **<bytes_sent>** and **<bytes_recv>** from the data counter result in NV after the module is powered on . The default result in NV is 0.

example

```

AT+QGDCNT=? //test command
+QGDCNT: (0,1)

OK
AT+QGDCNT? //Query the number of bytes sent or received
+QGDCNT: 3832,4618

OK
AT+QGDCNT=1 //Save the result to NV
OK
AT+QGDCNT=0 //restart data counter
OK

```

10.16. AT+QAUGDCNT automatically save traffic statistics

This command allows **AT+QGDCNT** to automatically save the traffic statistics results to NV.

AT+QAUGDCNT Automatically save traffic statistics	
test command AT+QAUGDCNT=?	response +QAUGDCNT: (list of supported <value>s)
	OK
Query command AT+QAUGDCNT?	response +QAUGDCNT: <value>
	OK
set command AT+QAUGDCNT=<value>	response OK or ERROR
	If the error is related to ME: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.

parameter

<value> Integer. **AT+QGDCNT** automatically saves the result to the time interval of NV. Range: 0, 30~65535;
Default value: 0; Unit: second. If set to 0, autosave is disabled. error code. refer to

<err> No. 12.5 chapter

example

```
AT+QAUGDCNT=?          //test command
+QAUGDCNT: (0,30-65535)

OK
AT+QAUGDCNT=35        //Set the time interval for AT+QGDCNT to automatically save the traffic statistics results to 35 seconds
OK
AT+QAUGDCNT?          //Query the time interval of automatic saving
+QAUGDCNT: 35
```

OK

10.17. AT+QNETDEVCTL connect USB network card

This command is used to connect the USB network card for network card dial-up.

AT+QNETDEVCTL connect USB network card

test command AT+QNETDEVCTL=?	response +QNETDEVCTL: (supported <type> list), (supported <cid> range), (supported <URC_en> range) OK
query command AT+QNETDEVCTL?	response +QNETDEVCTL: <type>,<cid>,<URC_en>,<state> OK
set command AT+QNETDEVCTL=<type>,<cid> [,<URC_en>]	response OK or ERROR If the error is related to ME: +CME ERROR: <err>
maximum response time	2 seconds
Feature Description	The order is effective immediately. When <type>=3 , the parameter configuration is automatically saved.

parameter

<type>	Integer. Action type. 0 Disconnect the network card 1 Only connect the network card once 3
<cid>	Automatically connect the network card Integer. The context of the PDP. Range: 1~15. This parameter specifies a target PDP context, which is used in other commands related to PDP context. Integer. Whether to enable URC
<URC_en>	+QNETDEVSTATUS: <status> report. 0 off 1 on integer. NIC connection status. 0 NIC disconnected from network —
<status>	

1 The network card is successfully
<state> connected to the network. Network
connection status 0 not connected 1
connected error code. refer to

<err>

No. 12.5 chapter

example

AT+QNETDEVCTL?**+QNETDEVCTL: (0,1,3),(1-15),(0,1)****OK****AT+QNETDEVCTL=1,1,1**

//Set the dialing mode of the network card to manual connection, use the first PDP, and enable URC reporting

OK**AT+QNETDEVCTL?**

//Query the status of the USB network card

+QNETDEVCTL: 1,1,1,1**OK**

11 Hardware related commands

11.1. AT+QPOWD turn off the module

This command is used to close the module. After the command is successfully executed , OK is returned immediately , and then the UE logs out of the network. UE output after logout is complete POWERED DOWN and enter the shutdown state. The maximum time to log out of the network is 60 seconds. To avoid data loss, the UE cannot be powered off before outputting POWERED DOWN or pulling down the module STATUS pin.

AT+QPOWD close the module	
test command	response
AT+QPOWD=?	+QPOWD: (list of supported <n>s)
	OK
set command	response
AT+QPOWD[=<n>]	OK
	POWERED DOWN
maximum response time	300 milliseconds
Feature Description	/

parameter

<n>	Integer. The module is powered off. 0 shutdown immediately 1 shutdown normally
-----	--

11.2. AT+CCLK real-time clock

This command is used to set and query the real-time clock (RTC) of the module.

AT+CCLK real-time clock	
test command	response

AT+CCLK=?	OK
query command	response
AT+CCLK?	+CCLK: <time>
	OK
set command	response
AT+CCLK=<time>	OK
	If the error is related to ME functionality: +CME ERROR: <err>
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to	
3GPP TS 27.007	

parameter

<time> string type. Format: "yy/MM/dd,hh:mm:ss±zz", indicating year (last two digits), month, day, hour, minute, second and time zone respectively (displays local time and GMT time in units of 15 minutes difference; range: -48 ~ +56). For example: May 6, 1994 22:10:00 GMT + 2 hours equals "94/05/06,22:10:00+08". <err> Error code. refer to

No. 12.5 chapter

example

```
AT+CCLK?                                //Query local time
+CCLK: "08/01/04,00:19:43+00"
OK
```

11.3. AT+QSCLK disable/enable sleep mode

This command is used to control whether the module enters sleep mode. If set <n>=1, when both DTR and WAKEUP_IN pins are pulled high, the module will directly enter sleep mode. If both DTR and WAKEUP_IN pins are pulled low, the module cannot enter sleep mode, only when both DTR and WAKEUP_IN pins are pulled high, the module can enter sleep mode.

AT+QSCLK disable/enable sleep mode	
Test command	response
AT+QSCLK=?	+QSCLK: (list of supported <n>s)



	OK
query command AT+QSCLK?	response +QSCLK: <n>
	OK
set command AT+QSCLK=<n>	response OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.
refer to Quectel	

parameter

<n>	Integer. Disable or enable sleep mode. 0 disables 1 enables. Controlled by DTR and WAKEUP_IN
------------------	--

11.4. AT+CBC query/read battery charging information

This command is used to query or read the charging status information of the battery.

AT+CBC query/read battery charging information	
test command AT+CBC=?	response +CBC: (supported <bcs> range),(supported <bcl> range),<voltage>
	OK
Excuting an order AT+CBC	response +CBC: <bcs>,<bcl>,<voltage>
	OK
maximum response time	300 milliseconds
Feature Description	This command takes effect immediately; the parameter configuration is not saved.

parameter

<bcs>	Integer. Battery charge status. 0 Not charging 1 Charging 2 Charging completed Integer. battery power. 0–100 Integer
<bcl>	percentage of battery power remaining. battery voltage. Unit: mV.
<voltage>	

example

AT+CBC

+CBC: 0,0,3899 //Read the current battery voltage as 3899mV

OK

Remark

Some module models do not support this command or the error is large. For detailed information about the support of the module model, please refer to the hardware reference design guidebook of the corresponding model.

11.5. AT+QADC read ADC value

This command is used to read the voltage value of ADC channel.

AT+QADC read ADC value	
test command	response
AT+QADC=?	+QADC: (list of supported <port>s)
	OK
set command	response
AT+QADC=<port>	+QADC: <status>,<value>
	OK
maximum response time	300 milliseconds
Feature Description	/

parameter

<port> Integer. ADC channel number.

0 ADC channel 0 1

ADC channel 1 Integer.

<status> Whether the ADC value was successfully
read. 0 failure 1 success Specifies the
voltage of the ADC channel. Unit: mV.

<value>

Remark

Some module models do not support this command or the error is large. For detailed information about the support of the module model, please refer to the hardware reference design guidebook of the corresponding model.

12 Appendix

12.1. Abbreviations

Table 6: Terminology Abbreviations

abbreviation	English full name	Chinese full name
3GPP	3rd Generation Partnership Project	3rd Generation Partnership Project
ACK	acknowledgment	confirmation message
AMR	Adaptive Multi-Rate	adaptive multi-rate
APNs	Access Point Name	access point name
ASCII	American Standard Code for Information Interchange	American Standard Code for Information Interchange
BAIC	Bar All Incoming Calls	block all calls
BAOC	Bar All Outgoing Calls	ban all outgoing calls
BCD	Binary-Coded Decimal	binary coded decimal
BIC Roam	Bar Incoming Calls when Roaming outside the home country	Barring all incoming calls while roaming outside of home
BOIC	Bar Outgoing International Calls	All international calls are prohibited
BOIC-exHC	Bar Outgoing International Calls except to Home Country	International outbound calls are prohibited except for the home country
CBM	Cell Broadcast Message	cell broadcast message
CBS	Cell Broadcast Service	Cell Broadcasting Service
COL	Connected Line	called line
CS	Circuit Switched/Circuit Switching	circuit switching
CSD	Circuit Switched Data	circuit switched data



CUG	Closed User Group	closed user group
DCD	Data Carrier Detection	Data Carrier Detect
DCE	Data Circuit-terminating Equipment	data circuit terminal equipment
DCS	Data Coding Scheme	data encoding scheme
DHCP	Dynamic Host Configuration Protocol	Dynamic Host Settings Protocol
DTE	Data Terminal Equipment	data terminal equipment
DTR	Data Terminal Ready	data terminal ready
ECT	Explicit Call Transfer	call transfer
EDGE	Enhanced Data Rates for GSM Evolution	Enhanced Data Rate GSM Evolution Technology
EGPRS	Enhanced General Packet Radio Service	Enhanced Data Rate GSM Evolution Technology
EPS	Evolved Packet System	Evolved Packet System
ESM	EPS Session Management	EPS session management
E-UTRAN Evolved Universal Terrestrial Radio Access Network Evolved Universal Terrestrial Radio Access Network		
FDD	Frequency Division Duplex	frequency division duplex
GGSN	Gateway GPRS Support Node	Gateway GPRS support node
GMM	GPRS Mobility Management	GPRS Mobility Management
GMT	Greenwich Mean Time	Greenwich Mean Time
GPIOs	General-Purpose Input/Output	Universal I/O
GPRS	General Packet Radio Service	General Packet Radio Service
GSM	Global System for Mobile Communications	GSM
HLR	Home Location Register	Home Location Register
HSDPA	High Speed Downlink Packet Access	High Speed Downlink Packet Access
HSPA+	High Speed Packet Access	Enhanced High Speed Packet Access
HSUPA	High Speed Uplink Packet Access	High Speed Uplink Packet Access
ICCID	Integrated Circuit Card Identifier	IC card identification number



IMEI	International Mobile Equipment Identity	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity	International Mobile Subscriber Identity
IP	Internet Protocol	internet protocol
IPv4	Internet Protocol version 4	Version 4 Internet Protocol
IPv6	Internet Protocol version 6	Version 6 of the Internet Protocol
IRA	International Reference Alphabet (7-bit coded character set)	7-bit International Reference Alphabet Coded Character Set
LLC	Logical Link Control	Logical Link Control
LTE	Long-Term Evolution	long term evolution
ME	Mobile Equipment	Mobile devices
MO	Mobile Original	mobile caller
MS	Mobile Station	mobile station
MSISDN	Mobile Subscriber International Integrated Service Digital Network number	International Mobile Subscriber Identity
MT	Mobile Terminal	mobile terminal
NAS	Non-Access Stratum	non-access stratum
NICs	Network Interface Controller	network interface controller
NITZ	Network Identity and Time Zone / Network Informed Time Zone	Network ID and time zone
NSAPI	Network Service Access Point Identifier	Web service access point identifier
NV	Non-Volatile Random Access Memory	non-volatile memory
P-CSCF	Proxy-Call Session Control Function	Agent Call Session Control Features
PDN	Public Data Network	public data network
PDPs	Packet Data Protocol	packet data protocol
PDU	Protocol Data Unit	protocol data unit
PIN	Personal Identification Number	PIN
PLMN	Public Land Mobile Network	public land mobile network
PPP	Point-to-Point Protocol	point-to-point protocol



P.S.	Packet Switch	packet switching
PSC	Primary Synchronization Code	basic synchronization code
PUK	PIN Unlock Key	PIN Unlock Code
RDI	Remote Defect Indication	remote defect indication
RF	Radio Frequency	radio frequency
RI	Ring Indicator	ringing indication
RRC	Radio Resource Control	Radio Resource Control
RSCP	Received Signal Code Power	Received signal code power
RTC	Real-Time Clock	Real Time Clock
RTS/CTS	Request To Send/Clear To Send	request/clear send
RxQual	Receive Quality	Receive quality
SAP	Service Access Point	service access point
SDUs	Service Data Unit	service data unit
SMS	Short Messag Service	SMS
SMSC	Short Message Service Center	short message service center
SNDCP	SubNetwork Dependence Convergence Protocol Subnet related convergence protocol	
TA	Terminal Adapter	terminal adapter
TCP	Transmission Control Protocol	transmission control protocol
TDD	Time Division Duplex	time division duplex
TE	Terminal Equipment	Terminal Equipment
TFT	Traffic Flow Template	business flow template
UART	Universal Asynchronous Receiver/Transmitter	Universal Asynchronous Transmitter
UCS2	Universal Character Set (UCS-2) Format	Universal character set format
UDH	User Data Header	User Data Header
UDP	User Datagram Protocol	User Datagram Protocol

UE	User Equipment	user equipment
UICC	Universal Integrated Circuit Card	Universal Integrated Circuit Card
UIM	User Identity Module	Subscriber Identity Module
UMTS	Universal Mobile Telecommunications System	Universal Mobile Communication System
URC	Unsolicited Result Code	unsolicited result code
USB	Universal Serial Bus	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module	(Global) Subscriber Identity Module
UTRAN	Universal Terrestrial Radio Access Network	Universal Terrestrial Radio Access Network
VBAT	Voltage at Battery (Pin)	Battery voltage (pin)
VLR	Visitor Location Register	visitor location register
WCDMA	Wideband Code Division Multiple Access	wideband code division multiple access

12.2. AT commands and parameters affected by AT&F

Table 7: AT commands and parameters affected by AT&F

AT commands	parameter name	Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATS3	<n>	13
ATS4	<n>	10
ATS5	<n>	8
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1

AT&D	<value>	2
AT+IFC	<dce_by_dte>,<dte_by_dce>	0,0
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CMEE	<n>	1
AT+CSCS	<chset>	"GSM"
AT+CSMS	<service>	0
AT+CMGF	<mode>	0
AT+CSMP	<fo>,<vp>,<pid>,<dcs>	17,167,0,0
AT+CSDH	<show>	0
AT+CSCB	<mode>	0
AT+CPMS	<mem1>,<mem2>,<mem3>	"ME","ME","ME"
AT+CNMI	<mode>,<mt>,<bm>,<ds>,<bfr>	2,1,0,0,0
AT+CMMS	<n>	0
AT+COLP	<n>	0
AT+CTZR	<reporting>	0
AT+CPBS	<storage>	SM
AT+CGEREP	<mode>,<brf>	0,0
AT+CEREG	<n>	0

12.3. AT commands and parameters affected by AT&W

Table 8: AT commands and parameters affected by AT&W

AT commands	parameter name	Whether to display via AT&V
ATE	<value>	Yes

ATQ	<n>	Yes
ATS0	<n>	Yes
ATV	<value>	Yes
ATX	<value>	Yes
AT&C	<value>	Yes
AT&D	<value>	Yes
AT+IFC	<dce_by_dte>,<dte_by_dce>	no
AT+IPR	<rate>	no
AT+CREG	<n>	no
AT+CGREG	<n>	no
AT+CEREG	<n>	no

12.4. AT commands and parameters affected by ATZ

Table 9: AT commands and parameters affected by ATZ

AT commands	parameter name	Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+IFC	<dce_by_dte>,<dte_by_dce>	0,0



AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CEREG	<n>	0

12.5. Summary of CME ERROR error codes

The final result code +CME **ERROR**: <err> indicates an error related to the mobile device or the network. The operation is similar to the **ERROR** result code. If any command in the same command line reports +CME **ERROR**: <err>, the command after the command that reports +CME **ERROR**: <err> in the command line will not be executed, and the command that has been executed before the command **ERROR** or **OK** result codes will not be returned . The reported <err> can be numeric or character, and the specific reporting format can be set by **AT+CMEEE** .

The <err> value is commonly used for normal message commands. The following table lists some common or GPRS-related **ERROR** codes, this table does not include GSM specifications GSM protocol error-related error codes described in .

Table 10: +CME **ERROR**: <err> error code description

Numeric <err>	char <err>	Chinese meaning
0	phone failure	call failed
1	no connection to phone	phone not connected
2	phone-adaptor link reserved	Leave the phone adapter connected
3	operation not allowed	operation not allowed
4	operation not supported	operation not supported
5	PH-SIM PIN required	PH-SIM card PIN code required
6	PH-FSIM PIN required	PH-FSIM card PIN code required
7	PH-FSIM PUK required	PH-FSIM card PUK code is required
10	SIM not inserted	No SIM card inserted
11	SIM PIN required	SIM PIN required
12	SIM PUK required	SIM card PUK code required
13	SIM failure	SIM card failed
14	SIM busy	SIM card busy



15	SIM wrong	SIM card error
16	incorrect password	The password is incorrect
17	SIM PIN2 required	SIM card PIN2 code required
18	SIM PUK2 required	SIM card PUK2 code required
20	memory full	memory is full
twenty one	invalid index	invalid index
twenty two	not found	Not found
twenty three	memory failure	Not enough storage
twenty four	text string too long	Text characters too long
25	invalid characters in text string	invalid text character
26	dial string too long	Dial character too long
27	invalid characters in dial string	invalid dial character
30	no network service	no internet service
31	network timeout	network timeout
32	network not allowed - emergency calls only	
40	network personalization PIN required	Network personalization PIN required
41	network personalization PUK required	Requires network personalized PUK code
42	network subset personalization PIN required	Network subset personalization PIN required
43	network subset personalization PUK required	Network subset personalization PUK required
44	service provider personalization PIN required	Network service provider personalization PIN required
45	service provider personalization PUK required	requires network service provider personalization PUK code
46	corporate personalization PIN required	Requires corporate personalization PIN
47	corporate personalization PUK required	Enterprise personalized PUK code is required
901	audio unknown error	audio unknown error
902	audio invalid parameters	Audio invalid parameter
903	audio operation not supported	Audio operations are not supported
904	audio device busy	audio device busy

12.6. CMS ERROR error code summary

The final result code +CMS **ERROR**: <err> indicates an error related to the mobile device or the network. The operation is similar to the **ERROR** result code, If no command is executed in the same command line, no **ERROR** or **OK** result code will be returned. The <err> value is commonly used for normal message commands.

The <err> value is commonly used for normal message commands.

Table 11: +CMS **ERROR**: <err> error code description

Numeric <err>	char <err>	Chinese meaning
300	ME failure	ME failed
301	SMS ME reserved	Keep SMS ME
302	operation not allowed	operation not allowed
303	operation not supported	operation not supported
304	invalid PDU mode	invalid PDU mode
305	invalid text mode	invalid text mode
310	(U)SIM not inserted	No (U)SIM card inserted
311	(U)SIM PIN required	(U)SIM PIN required
312	PH-(U)SIM PIN required	PH-(U)SIM card PIN code required
313	(U)SIM failure	(U)SIM failed
314	(U)SIM busy	(U)SIM is busy
315	(U)SIM wrong	(U)SIM card error
316	(U)SIM PUK required	(U)SIM PUK code required
317	(U)SIM PIN2 required	(U)SIM PIN2 code required
318	(U)SIM PUK2 required	(U)SIM PUK2 code required
320	memory failure	Not enough storage
321	invalid memory index	invalid memory index
322	memory full	memory is full
330	SMSC address unknown	Unknown SMSC address



331	no network service	no internet service
332	network timeout	network timeout
500	unknown	unknown reason
512	(U)SIM not ready	(U)SIM not ready
513	message length exceeds	Short message length is too long
514	invalid request parameters	invalid request parameter
515	ME storage failure	ME out of memory
517	invalid service mode	invalid service mode
528	more message to send state error	More short message sending status error
529	MO SMS is not allowed	MO SMS not allowed
530	GPRS is suspended	GPRS deactivated
531	ME storage full	ME memory is full

12.7. URC summary

Table 12: URC Summary

Serial number URC	meaning	condition
1 +CREG: <stat>	Indicates ME registration status	AT+CREG=1
2 +CREG: <stat>[,<lac>,<ci>[,<Act>]]	After a neighbor change, indicates whether the current network has indicated ME status, and report the location area code at the same time	AT+CREG=2
3 +CGREG: <stat>	Indicates the network registration status of the ME	AT+CGREG=1
4 +CGREG: <stat>[,<lac>,<ci>[,<Act>]]	Indicate ME network registration status and location information AT+CGREG=2	AT+CGREG=2
5 +CEREG: <stat>	Indicates EPS network registration status	AT+CEREG=1
6 +CEREG: <stat>[,<tac>,<ci>[,<Act>]]	Indicates E-UTRAN network cell change	AT+CEREG=2
7 +CTZV: <tz>	Time zone reporting	AT+CTZR=1
8 +CTZE: <tz>,<dst>,<time>	Extended time zone reporting	AT+CTZR=2



9	+CMTI: <mem>,<index>	Receive a new short message and save it to memory	AT+CNMI
10	+CMT: [<alpha>],<length><CR><LF><pdu>	Receive new short message and output to TE directly (PDU mode)	AT+CNMI
11	+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sc>,<tosca>,<length>]<CR><LF><data>	Receive a new short message and output it directly to TE (text mode)	AT+CNMI
12	^HCMT:		
	<oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>	Receive a new short message and output it directly to TE	AT+CNMI
13	+CBM: <length><CR><LF><p du>	Receive new CBM and output directly (PDU mode)	AT+CNMI
14	+CBM:		
	<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><a>	Receive new CBM and output directly (text mode)	AT+CNMI
15	+CDS: <length><CR><LF><p du>	Receive new CDS and output directly (PDU mode)	AT+CNMI
16	+CDS: <fo>,<mr>,[<ra>],[<tor>],<scts>,<dt>,<st>	Receive new CDS and output directly (text mode)	AT+CNMI
17	+CDSI: <mem>,<index>	Receive a new message status report and save it to the memory	AT+CNMI
18	+COLP: <number>,<type>,[<s ubaddr>],<satype>,[<alpha>]	When calling, display COL (called line) on TE AT+COLP=1	
19	NO CARRIER	PPP link hangs up	ATV1
20	+CRING	Indicate incoming call to TE with unsolicited result code instead of normal RING	N/A
twenty one	RING	ringtone	N/A
22	+CFUN: 1	All functions of MT are available	N/A
twenty three	+CPIN: <state>	(U)SIM card PIN status	N/A
twenty four	+QIND: SMS DONE	SMS initialization complete	N/A
25	+QIND: PB DONE	Phonebook initialization complete	N/A
26	+QIND: airplanestatus,<status>	W_DISABLE# pin state change	AT+QCFCFG="airplanestatus",1
27	+QIND: "csq",<rssi>,<ber>	Signal strength and channel bit error rate variation	AT+QINDCFG="csq ",1
28	+QIND: "datastatus",<suspend ed>,<reason>	Data Service Status Change	AT+QINDCFG="datastatus",1
29	^MODE:<main_mode>,<sub_mode>	Indicates network major and submodes	AT+QINDCFG="mode",1



30	+QIND: "smsfull",<storage> SMS storage is full		AT+QINDCFG="sm sfull", 1
31	+QIND: "act",<actvalue>	Network Access Technology Changes	AT+QINDCFG="act ,1
32	+QIND: "SQI",<RSRP>,<RSR Q>,<SINR>	Reference signal received power, reference received quality and signal-to- interference-plus-noise ratio changes	AT+QINDCFG="sqi ",1
33	+QIND: PB DONE	incoming phone book	AT+QINDCFG="ph onebook",1
34	+QSIMSTAT: <enable>,<insert ed_status>	(U)SIM card removal or insertion	AT+QSIMSTAT=1
35	^DSCI: <id>,<dir>,<stat>,<type>,<number>,<num_type>	Indicate call status	AT^DSCI=1
36	POWERED DOWN	Module power down	AT+QPOWD
37	+CGEV: REJECT <PDP_type>,<PDP_addr>	Ask the network to activate PDP, and it is automatically rejected AT+CGEREP=2,1	
38	+CGEV: NW REACT <PDP_type>,<PDP_addr>,[<cid>]	Request PDP reactivation from network	AT+CGEREP=2,1
39	+CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>]	Network Forced Deactivation Context	AT+CGEREP=2,1
40	+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]	ME forcefully deactivates the context	AT+CGEREP=2,1
41	+CGEV: NW DETACH	Network Forced Detach Packet Domain	AT+CGEREP=2,1
42	+CGEV: ME DETACH	ME Forced Detach Packet Field	AT+CGEREP=2,1
43	+CGEV: NW CLASS <class> network force change MS class		AT+CGEREP=2,1
44	+CGEV: ME CLASS <class> ME force to change MS class		AT+CGEREP=2,1
45	+CGEV: PDN ACT <cid>	Primary PDP context is activated in GSM/UMTS AT+CGEREP=2,1	
46	+CGEV: PDN DEACT <cid> The primary PDP context in GSM/UMTS is deactivated AT+CGEREP=2,1		
47	+QNETDEVSTATUS: <status> NIC dial-up status		AT+QNETDEVCTL=<type>,<cid>,1

12.8. SMS character set conversion

Three alphabets are defined for SMS in 3GPP TS 23.038 DCS (Data Coding Scheme): GSM 7-bit default alphabet, 8-bit data and UCS2 (16-bit). AT+CSMP is used to set DCS in text mode (AT+CMGF=1). In text mode, DCS and AT+CSCS determine the way of SMS text input and output.

Table 13: SMS text input and output methods

DCS	AT+CSCS	SMS text input and output methods
GSM 7-bit	GSM	Input or output GSM character set
GSM 7-bit	IRA	Import or export the IRA character set. Input: UE converts IRA characters to GSM characters. Output: UE converts GSM characters
GSM 7-bit	UCS2	to IRA characters. Input or output a hexadecimal string similar to PDU mode. Therefore, only characters 0–9 and A–F are supported. Input: UE converts UCS2 hex string to GSM characters. Output: UE converts GSM characters to UCS2 hexadecimal string.
UCS2	-	Ignore the AT+CSCS value, input or output a hexadecimal string similar to PDU mode. Only characters 0–9 and A–F are supported.
8-bit	-	Ignore the AT+CSCS value, input or output a hexadecimal string similar to PDU mode. Only characters 0–9 and A–F are supported.

When the DCS is GSM 7-bit, input or output conversion is required, please refer to the table below for details.

Table 14: Input conversion table (DCS is **GSM 7-bit** and **AT+CSCS="GSM"**)

serial number 0	1	2	3	4	5	6	7
0	00	10	20	30	40	50	60
1	01	11	21	31	41	51	61
2	02	12	22	32	42	52	62
3	03	13	23	33	43	53	63
4	04	14	24	34	44	54	64
5	05	15	25	35	45	55	65
6	06	16	26	36	46	56	66

7	07	17	27	37	47	57	67	77
8	08	18	28	38	48	58	68	78
9	09	19	29	39	49	59	69	79
A	0A	Submit 2A		3A	4A	5A	6A	7A
B	0B	Cancel 2B		3B	4B	5B	6B	7B
C	0C	1C	2C	3C	4C	5C	6C	7C
D.	0D	1A	2D	3D	4D	5D	6D	7D
E.	0E	1E	2E	3E	4E	5E	6E	7E
f	0F	1F	2F	3F	4F	5F	6F	7F

Table 15: Output conversion table (DCS is **GSM 7-bit** and **AT+CSCS="GSM"**)

serial number 0	1	2	3	4	5	6	7	
0	00	10	20	30	40	50	60	70
1	01	11	21 twenty one	31	41	51	61	71
2	02	12	22 twenty two	32	42	52	62	72
3	03	13	23 twenty three	33	43	53	63	73
4	04	14	24 twenty four	34	44	54	64	74
5	05	15	25	35	45	55	65	75
6	06	16	26	36	46	56	66	76
7	07	17	27	37	47	57	67	77
8	08	18	28	38	48	58	68	78
9	09	19	29	39	49	59	69	79
A	0D0A		2A	3A	4A	5A	6A	7A
B	0B		2B	3B	4B	5B	6B	7B
C	0C	1C	2C	3C	4C	5C	6C	7C
D.	0D	1A	2D	3D	4D	5D	6D	7D

E.	0E	1E	2E	3E	4E	5E	6E	7E
f	0F	1F	2F	3F	4F	5F	6F	7F

Table 16: **GSM** extended characters (GSM encoding)

serial number 0	1	2	3	4	5	6	7
0				1B40			
1							
2							
3							
4		1B14					
5							
6							
7							
8		1B28					
9		1B29					
A							
B							
C		1B3C					
D.		1B3D					
E.		1B3E					
f		1B2F					

Table 17: Input conversion table (DCS is **GSM 7-bit** and **AT+CSCS="IRA"**)

serial number 0	1	2	3	4	5	6	7
0	20	20	30	00	50	20	70
1	20	20	31	41	51	61	71

2	20	20	32	42	52	62	72
3	20	20	33	43	53	63	73
4	20	20	02	34	44	54	74
5	20	20	25	35	45	55	75
6	20	20	26	36	46	56	76
7	20	20	27	37	47	57	77
8	backspace	20	28	38	48	58	78
9	20	20	29	39	49	59	79
A	0A	Submit	2A	3A	4A	5A	6A
B	20	Cancel	2B	3B	4B	1B3C	6B
C	20	20	2C	3C	4C	1B2F	6C
D.	0D	20	2D	3D	4D	1B3E	6D
E.	20	20	2E	3E	4E	1B14	6E
f	20	20	2F	3F	4F	11	6F
							20

Table 18: IRA Extended Characters

serial number	A	B	C	D.	E.	f
0	20	20	20	20	7F	20
1	40	20	20	5D	20	7D
2	20	20	20	20	20	08
3	01	20	20	20	20	20
4	twenty four	20	5B	20	7B	20
5	03	20	0E	20	0F	20
6	20	20	1C	5C	1D	7C
7	5F	20	09	20	20	20
8	20	20	20	0B	04	0C
9	20	20	1F	20	05	06
A	20	20	20	20	20	20

B	20	20	20	20	20	20	20
C	20	20	20	5E	07	7E	
D.	20	20	20	20	20	20	20
E.	20	20	20	20	20	20	20
f	20	60	20	1E	20	20	

Table 19: Output conversion table (DCS is **GSM 7-bit** and **AT+CSCS="IRA"**)

serial number 0	1	2	3	4	5	6	7
0	40	20	20	30	A1	50	BF
1	A3	5F	—	31	41	51	61
2	—	20	—	32	42	52	62
3	A5	20	—	33	43	53	63
4	E8	20	A4	34	44	54	64
5	E9	20	25	35	45	55	65
6	F9	20	26	36	46	56	66
7	EC	20	27	37	47	57	67
8	F2	20	28	38	48	58	68
9	C7	20	29	39	49	59	69
A	0D0A	—	2A	3A	4A	5A	6A
B	D8	—	2B	3B	4B	C4	6B
C	F8	C6	2C	3C	4C	D6	6C
D.	0D	E6	2D	3D	4D	D1	6D
E.	C5	DF	2E	3E	4E	DC	6E
f	E5	C9	2F	3F	4F	A7	6F
							E0

Table 20: GSM extended characters (ISO-8859-1/Unicode)

serial number 0	1	2	3	4	5	6	7
0				7C			
1							
2							
3							
4		5E					
5							
6							
7							
8		7B					
9			7D				
A							
B							
C		5B					
D.			7E				
E.			5D				
f		5C					

Since the lower 8 bits of the UCS2 character set are the same as the IRA characters, so:

- ÿ DCS is equal to GSM 7-bit and **AT+CSCS="UCS2"** conversion table is similar to **AT+CSCS="IRA"**.
- ÿ fmt is equal to GSM 7-bit and **AT+CSCS="GSM"** conversion table is similar to **AT+CSCS="GSM"**.
- ÿ fmt is equal to GSM 7-bit and **AT+CSCS="IRA"** conversion table is similar to **AT+CSCS="IRA"**.
- ÿ fmt is equal to GSM 7-bit and **AT+CSCS="UCS2"** conversion table is similar to **AT+CSCS="IRA"**.

Differences in the way SMS text is input or output see for details^{surface} **13**.

12.9. AT+CEER Extended Error Report List

Table 21: AT+CEER Extended Error Report List

CS domain internal reasons	Chinese meaning
No cause information available (default)	no cause information
Phone is offline	phone offline
No service available	no service
Network release, no reason given	Network release, unspecified reason
Received incoming call	answer the call
Client ended call	Client ends the call
UIM not present	UIM does not exist
Access attempt already in progress	Access attempt already exists
Access failure, unknown source	Access failed, unknown source
Concur service not supported by network	Network does not support Concur service
No response received from network	No network response received
GPS call ended for user call	Terminate GPS call in favor of user call
SMS call ended for user call	Terminate SMS call in favor of user call
Data call ended for emergency call	Terminate data calls to support emergency calls
Rejected during redirect or handoff	Rejected when transferring or switching
Lower-layer ended call	Bottom end call
Call origination request failed	Caller request failed
Client rejected incoming call	Client rejects incoming call
Client rejected setup indication	Client Deny Set Indication
Network ended call	The network ends the call
No funds available	no funds available
No service available	no service

Full service not available	full service unavailable
Maximum packet calls exceeded	Maximum number of group calls exceeded
Video connection lost	video connection lost
Video protocol closed after setup	Video protocol turned off after installation
Video protocol setup failure	Video protocol setting failed
Internal error	internal error
CS domain network reason	Chinese meaning
Unassigned/unallocated number	Unassigned number (empty number)
No route to destination	no route to destination
Channel unacceptable	unacceptable channel
Operator determined barring	Block business decided by the operator
Normal call clearing	normal call clear
User busy	User is busy
No user responding	no user response
User alerting, no answer	User rings, no answer
Call rejected	call rejected
Number changed	number change
Non selected user clearing	Clear non-selected users
Destination out of order	terminal failure
Invalid/incomplete number	invalid/incomplete number
Facility rejected	facility denied
Response to status inquiry	Responses to Status Queries
Normal, unspecified	normal, unspecified
No circuit/channel available	No circuit/channel available
Network out of order	network failure
Temporary failure	Temporary failure



Switching equipment congestion	Switching equipment congestion
Access information discarded	Access information is discarded
Requested circuit/channel not available	The requested circuit/channel is not available
Resources unavailable, unspecified	Resource unavailable, unspecified
Quality of service unavailable	QoS unavailable
Requested facility not subscribed	The requested device is not reserved
Incoming calls barred within the CUG	Incoming Call Interruption in CUG
Bearer capability not authorized	Bearing capacity not approved
Bearer capability not available	Bearing capacity is currently unavailable
Service option not available	Services/Options not available
Bearer service not implemented	Bearer service not implemented
ACM >= ACM max	ACM equal to or greater than ACM max
Requested facility not implemented	The requested device is not implemented
Only RDI bearer is available	Only RDI bearers are available
Service option not implemented	Service/Option Not Implemented
Invalid transaction identifier value	invalid transaction identifier
User not member of CUG	User is not a member of CUG
Incompatible destination	incompatible destination
Invalid transit network selection	Invalid transit network selection
Semantically incorrect message	semantic error message
Invalid mandatory information	Invalid Mandatory Information
Message non-existent/not implemented	Message does not exist or is not implemented
Message type not compatible with state	The message type is not compatible with the protocol state
IE non-existent/not implemented	Information element does not exist or is not implemented
Conditional IE error	Condition IE Error
Message not compatible with state	The message is not compatible with the protocol state

Recovery on timer expiry	Resume when the timer expires
Protocol error, unspecified	protocol error, unspecified
Interworking, unspecified	interoperable, unspecified
CS Domain Network Denied	Chinese meaning
IMSI unknown in HLR	The IMSI is not defined by the HLR
Illegal MS	Illegal MS
IMSI unknown in VLR	The IMSI is not defined by the VLR
IMEI not accepted	Unacceptable IMEI
Illegal ME	Illegal ME
GPRS services not allowed	GPRS service not allowed
GPRS and non GPRS services not allowed	GPRS and non-GPRS services not allowed
MS identity cannot be derived	Unable to get user identity
Implicitly detached	User Implicit Separation
PLMN not allowed	PLMN not allowed
Location area not allowed	disallowed location zone
Roaming not allowed	no roaming allowed
GPRS services not allowed in PLMN	Current PLMN does not allow GPRS service
No suitable cells in location area	There is no matching cell in this location area
MSC temporary not reachable	MSC temporarily unreachable
Network failure	Network Error
MAC failure	MAC error
Synch failure	Sync failed
Congestion	congestion
GSM authentication unacceptable	GSM authentication failed
Service option not supported	Unsupported service selection
Requested service option not subscribed	Select the service for the scheduled request

Service option temporary out of order	Service Selection Temporary Failure
Call cannot be identified	call not recognized
No PDP context activated	No active PDP context
Semantically incorrect message	semantic error message
Invalid mandatory information	Invalid Mandatory Information
Message type non-existent	message type does not exist
Message type not compatible with state	The message type is not compatible with the protocol state
Information element non-existent	information element does not exist
Message not compatible with state	The message is not compatible with the protocol state
RR release indication	RR release indication
RR random access failure	RR random access failure
RRC release indication	RRC release indication
RRC close session indication	RRC close session indication
RRC open session failure	RRC session open failed
Low level failure	underlying error
Low level failure no redial allowed	Underlying error, redial not allowed
Invalid SIM	Invalid SIM card
no service	no service
Timer T3230 expired	Timer T303 expires
No cell available	No cell available
Wrong state	error state
Access class blocked	Access type blocked
Abort message received	abort message received
Other causes	other reasons
Timer T303 expired	Timer T303 expires
No resources	no resources



Release pending	to be released
Invalid user data	invalid user data
Internal reason of PS domain	Chinese meaning
Invalid connection identifier	invalid connection identifier
Invalid NSAPI	invalid NSAPI
Invalid primary NSAPI	void preferred NSAPI
PDP establish timeout	PDP creation timeout
invalid field	invalid field
SNDCP failure	SNDCP failed
RAB setup failure	RAB setup failed
No GPRS context	No GPRS context
PDP activate timeout	PDP activation timeout
PDP modify timeout	PDP modification timeout
PDP inactive max timeout	PDP inactivity max timeout
PDP lower layer error	PDP underlying error
PDP duplicate	PDP duplication
Access technology change	Access technology changes
PDP unknown reason	PDP unknown reason
Cause of PS domain network	Chinese meaning
LLC or SNDCP failure	LLC or SDNCP error
Insufficient resources	lack of resources
Missing or unknown APN	Missing or unknown APN
Unknown PDP address or PDP type	Unknown PDP address or PDP type
User authentication failed	User authentication failed
Activation rejected by GGSN	Activation request rejected by GGSN
Activation rejected, unspecified	Activation request denied, unspecified



Service option not supported	Unsupported service selection
Requested service option not subscribed	Service Selection for Unbooked Requests
Service option temporary out of order	Service Selection Temporary Failure
NSAPI already used (not sent)	NSAPI already taken (not sent)
Regular deactivation	regular deactivation
QoS not accepted	unacceptable quality of service
Network failure	Network Error
Reactivation required	Reactivation required
Feature not supported	function not supported
Semantic error in the TFT operation	TFT operation semantic error
Syntactical error in the TFT operation	TFT operation syntax error
Unknown PDP context	Unknown PDP context
PDP context without TFT already activated	PDP context without TFT activated
Semantic errors in packet filter	Group filter semantic error
Syntactical errors in packet filter	Group filter syntax error
Invalid transaction identifier	invalid transaction identifier
Semantically incorrect message	semantic error message
Invalid mandatory information	Invalid Mandatory Information
Message non-existent/not implemented	Message does not exist or is not implemented
Message type not compatible with state	The message type is not compatible with the protocol state
IE non-existent/not implemented	Information element does not exist or is not implemented
Conditional IE error	Condition IE Error
Message not compatible with state	The message is not compatible with the protocol state
Protocol error, unspecified	protocol error, unspecified