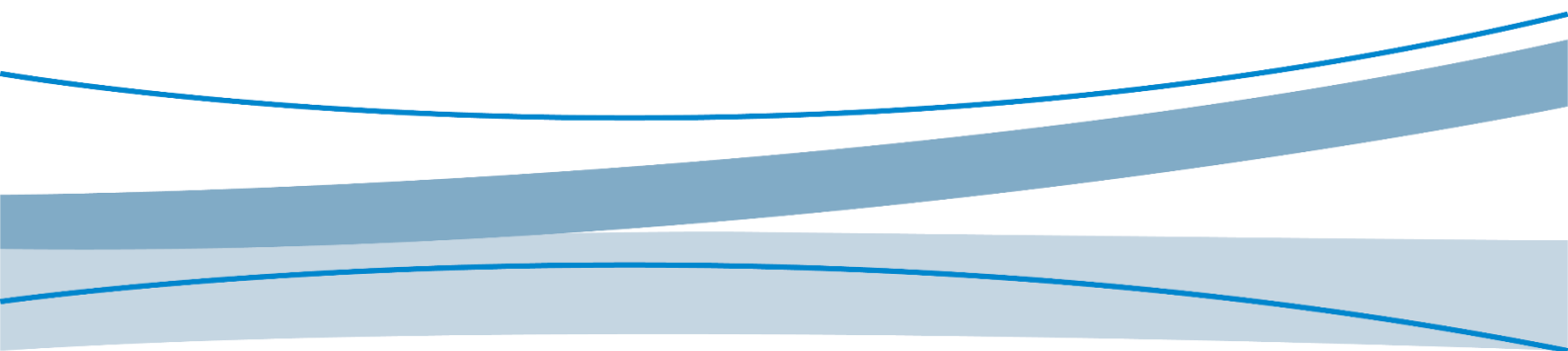




FG132

AT Commands User Manual

V1.1



Disclaimer

Any action you take in the course of using this document is at your own risk, and Fibocom shall not be liable for any damages or losses under any circumstances. Due to product version upgrade or other reasons, Fibocom reserves the right to modify any information in this document at any time without prior notice and any responsibility. Unless otherwise agreed, all statements, information and suggestions in this document do not constitute any express or implied guarantee.

This document may include the third-party information covering products, services, software, data, and so on. Fibocom does not control and assumes no responsibility for the third-party content, including but not limited to the accuracy, compatibility, reliability, availability, legitimacy, appropriateness, performance, non-infringement, and status update, unless otherwise specified in this document. Fibocom does not provide any guarantee or authorization for the third-party content mentioned or referenced in this document. If you need a third-party license, obtain it in an authorized or legal way, unless otherwise specified in this document.

Copyright Notice

Copyright © 2024 Fibocom Wireless Inc. All rights reserved.

Unless specially authorized by Fibocom, the recipient of the documents shall keep the documents and information received confidential, and shall not use them for any purpose other than the implementation and development of this project. Without the written permission of Fibocom, no unit or individual shall extract or copy part or all of the contents of this document without authorization, or transmit them in any form. Fibocom has the right to investigate legal liabilities for any offense and tort in connection with violation of confidentiality obligations, or unauthorized use or malicious use of the said documents and information in other illegal forms.

Trademark Statement

 The trademark is registered and owned by Fibocom Wireless Inc.

Other trademarks, product names, service names and company names appearing in this document are owned by their respective owners.

Contact Information

Website: <https://www.fibocom.com>

Address: 10/F-14/F, Block A, Building 6, Shenzhen International Innovation Valley, Dashi First Road, Xili Community, Xili Subdistrict, Nanshan District, Shenzhen

Tel: 0755-26733555

Contents

Applicable Model.....	7
Change History.....	8
1 AT Command Introduction	9
1.1 Principles.....	9
1.2 Syntax Format.....	10
1.3 Document Description.....	11
2 General Information	13
2.1 +CGMI, request manufacturer ID	13
2.2 +GMI, request manufacturer ID	14
2.3 +CGMM, request model ID	15
2.4 +GMM, request model ID.....	16
2.5 +CGMR, request software revision.....	17
2.6 +GMR, request revision	18
2.7 +CGSN, request IMEI.....	19
2.8 +GSN, request IMEI	22
2.9 +CFSN, request factory serial number	24
2.10 I, query identification information	25
2.11 +CIMI, request IMSI	26
2.12 +CCID, request integrate circuit card identity.....	27
2.13 +GTUSIM, check USIM card	28
2.14 +CMEE, report mobile termination error	29
2.15 +CEER, extended error report	31
3 Module Control and Status.....	33
3.1 AT, detect AT connection	33
3.2 V, module response format	33
3.3 Q, result code suppression.....	35
3.4 E, command echo	36
3.5 +MSMPD, disable/enable SIM card hot plug.....	37
3.6 +SIMSWAPCFG, set the detection level of the SIM CD.....	39

3.7 +CPWROFF, switch off MS	40
3.8 +CFUN, set module functionality.....	41
3.9 +MSTART, start message notification	43
3.10 +GTDUALSIM, dual SIM card switching.....	44
4 Sleep	47
4.1 +GTWAKE, enable wake-up host function.....	47
4.2 +GTLPMODE, set wake-up and sleep modes	48
4.3 +GTPMTIME, delay time for sending data	50
5 Network.....	52
5.1 +CSQ, signal strength	52
5.2 +CESQ, extended signal quality	53
5.3 +CREG, Network registration status.....	56
5.4 +CGREG, GPRS network registration.....	59
5.5 +CEREG, EPS network registration status	63
5.6 +C5GREG, 5GS network registration status	66
5.7 +COPS, select operators.....	69
5.8 +CPLS, select preferred PLMN list.....	72
5.9 +GTRAT, select Radio Access Technology.....	73
5.10 +GTACT, select RAT and BAND	75
5.11 +GTCCINFO, get cell current information.....	79
5.12 +COPN, read operator names	84
5.13 +CEMODE, UE modes of operation for EPS	85
5.14 +GTCELLLOCK, information configuration of cell lock.....	87
5.15 +GTROAMCFG, roaming dial control.....	89
5.16 +GTCELLSCAN, scan frequency and obtain the neighbor cell information	90
5.17 +GTRRCREL, Local quick release RRC connection function.....	94
5.18 +CEDRXS, eDRX setting	97
5.19 +CEDRXRDP, eDRX read dynamic parameters.....	100
5.20 +GTRXPWR, Signal Receiving Indication	102
5.21 +GTREJECTCAUSE, reject cause reporting.....	103
5.22 +GTCELLINFO, Get Serving Cell Information	105

5.23 +SIMLOCKCFG, configure the PLMN whitelist	107
5.24 +SIMLOCKSTATE, query current SIMLOCK state of module	109
5.25 +SIMLOCKOPR, modify the PLMN list added by +SIMLOCKCFG	110
5.26 +GTREJCAUSE, get the cause value for network failure	111
6 Call Control	114
6.1 D, dial command	114
6.2 H, hang-up call	115
6.3 A, answer incoming call	116
6.4 +CRC, cellular result codes and RING, +CRING incoming call indication	117
6.5 +CLIP, identify calling line	120
6.6 +CCWA, call waiting	123
6.7 +CHLD, call related supplementary service command	126
6.8 +CCFC, call forwarding number and conditions	128
6.9 +CLIR, calling line identification restriction	130
6.10 +CHUP, hang up call	132
6.11 +MDC, select desired messages to be displayed upon connection of a voice call	133
6.12 +CSTA, select address type	135
6.13 +GTECC, write emergency number	136
6.14 +CPAS, phone activity status	138
6.15 +CLCC, list current calls	139
6.16 +COLP, Connected Line Identity presentation Description	142
6.17 +CAVIMS, Availability for Voice Calls with IMS	144
7 SMS	146
7.1 +CSCS, select terminal character set	146
7.2 +CSMS, select message service	147
7.3 +CPMS, preferred message storage	148
7.4 +CMGF, message format	150
7.5 +CSCA, service center address	152
7.6 +CSMP, set text mode parameters	153
7.7 +CSDH, show text mode parameters	155
7.8 +CNMI, new message indications to terminal	156

7.9 +CNMA, new message acknowledgement	159
7.10 +CMGL, list messages.....	161
7.11 +CMGR, read message.....	163
7.12 +CMSS, send message from storage.....	167
7.13 +CMGW, write message to memory	168
7.14 +CMGD, delete message.....	169
7.15 +CGSMS, select service for MO SMS messages	171
7.16 +CMGS, send SMS to network.....	172
7.17 +CSCB, cell broadcast messages	174
7.18 +SMMFULL, set unsolicited response (SMS storage space is full).....	175
8 Data Packet Domain.....	178
8.1 +CGDCONT, define PDP context.....	178
8.2 +CGATT, packet domain attach or detach.....	185
8.3 +CGACT, activate or deactivate PDP context	186
8.4 +CGPADDR, GPRS address.....	188
8.5 +GTDNS, request DNS addresses	189
8.6 +CGEREP, report packet domain event.....	190
8.7 +CGAUTH, set PDP authentication parameters	192
8.8 +MGAUTH, set authentication type	194
8.9 +CGPIAF, printing IP address format	196
8.10 +CGCONTRDP, PDP context read dynamic parameters	198
8.11 +GTSTATIS, query current rate and total data volume	200
9 Audio	202
9.1 +CLVL, loudspeaker volume level.....	202
9.2 +CMUT, mute control	203
9.3 +VTD, tone duration.....	204
9.4 +VTS, DTMF and tone generation	205
9.5 +GTDTMF, software decode.....	207
9.6 +MAPATH, audio path.....	208
9.7 +MAVOL, set volume level.....	209
9.8 +MMICG, select microphone gain value	210

10 System Time.....	212
10.1 +CCLK, read or set system date and time	212
10.2 +CTZU, automatically update time zone	213
10.3 +CTZR, time zone reporting	214
11 Hardware	217
11.1 +IPR, fixed DTE rate	217
11.2 +CBAUD, baud rate regulation	218
11.3 &K, RTS/CTS flow control.....	220
11.4 +IFC, RTS/CTS flow control.....	221
11.5 +ICF, DTE-DCE character frame definition	222
11.6 +WRIM, RI signal width setting.....	224
11.7 +GPIO, set and read GPIO	225
11.8 +CBC, battery charger connection	227
11.9 +MMAD, query ADC channel voltage value	228
11.10 +MTSM, temperature sensor measurement	229
11.11 +GTFMODE, enable hardware flight mode	232
11.12 +GTUSBMODE, set USB profile	233
11.13 +GTLPGEN, enable/disable LPG	235
12 Telephone Book.....	237
12.1 +CNUM, request MSISDN(s).....	237
13 Access and Security.....	240
13.1 +CPIN, enter PIN	240
13.2 +TPIN, query number of remaining SIM PIN/PUK entering attempts	242
13.3 +CPWD, change password.....	243
13.4 +CLCK, facility lock	245
13.5 +CPINR, remaining PIN retries	248
13.6 +CSIM, general SIM access	249
13.7 +CRSM, restricted SIM access.....	250
13.8 +CCHO, open UICC logical channel.....	252
13.9 +CCHC, close UICC logical channel	253
13.10 +CGLA, access general UICC logical channel	254

14 Data Connection Control	257
14.1 +GTRNDIS, RNDIS configuration.....	257
14.2 +GTAUTOCONNECT, automatically activate PDP	258
14.3 +GTIPPASS, enable IP pass.....	259
14.4 +GTPREDNSCFG, pre-configure DNS addresses.....	260
14.5 +GTDHCPRANGE, set DHCP IP range.....	262
15 Error Code Table.....	264
15.1 CME Error Codes.....	264
15.2 CMS Error Codes.....	267

Applicable Model

No.	Applicable Model	Description
1	FG132	-

Change History

V1.1 (2024-05-23)	Fix document formatting and description issues
V1.0 (2024-01-19)	Initial version.

1 AT Command Introduction

1.1 Principles

AT commands are sets of commands used to communicate with the cellular modem. AT commands are comprised of assemblies of ASCII characters which start with the "AT" prefix. AT commands are used to request services from the mobile modem, such as phone calls, short messages and other services.

Hardware system

The basic configuration of the system includes a modem and a terminal. The Fibocom module is a modem, which can be called a DCE or TA, such as a phone, cell phone, or radio. The terminal (PC or MCU) can be called a DTE or TE.

AT commands communicate and transfer data through the USB or UART interface.

Software protocol

The AT command interface is basically a request-based modem service. Any services are requested from the TE. Therefore, a request is called a "command." Each command must be answered by the "result code" of the TA. The result code reports the command status to the TE. The modem may bounce commands from the TE back to the TE.



Figure 1. Scenario 1

Some commands may include several "result codes" to send data back to the TE.

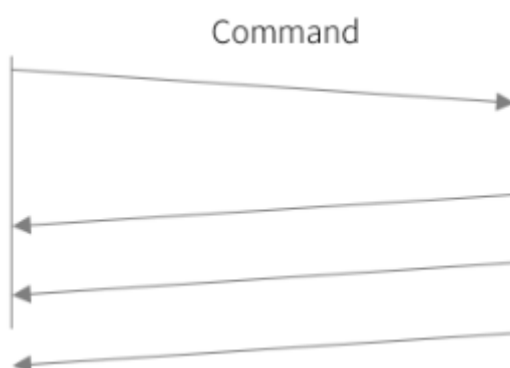


Figure 2. Scenario 2

Some commands may initiate a mode in which information, which may be referred to as an "unsolicited result code," is automatically sent to the TE when a specified event is

generated in the modem, even if the TE does not send a request.



Figure 3. Scenario 3

1.2 Syntax Format

Table 1. Symbolic convention

Syntax	Definition
<CR>	Carriage return, the character specified by the value of the S3 register.
<LF>	Newline character, specified by the value of the S4 register.
<...>	A name enclosed in angle brackets is a syntax element. The angle brackets do not appear on the command line.
[...]	Optional sub parameters of the command or optional parts of the terminal message response, enclosed in square brackets. The square brackets do not appear on the command line. When no sub parameters is provided in a parameter type command, the new value is equal to its previous value. In the operation type command, you should follow the recommended default settings for the sub parameters.
//	Indicates a comment and is not included in the command.

Command request

AT commands all start with "AT" or "at" and end with <CR> (except for the command A/ and + + +).

The AT command line can contain one or more commands, separated by delimiters. The Basic command does not require a delimiter, and other commands are separated use a semicolon (;).

Example:

```
AT+CSQ<CR>
```

```
ATE?<CR>
```

```
ATS0=1V1Q0E0<CR>
```

```
AT+IFC=0,0;+ICF=3,4;+CNMI=2,1,0,0,0<CR>
```

Scenario	Form	Description
Execution command	AT+xxx ATxxx ATxxx;	Execution command
Setting cpmmand	AT+xxx=<Value>	Set user-defined parameter values. <Value> consists of numeric or string

	ATxxx=<Value>	<p>constants.</p> <ul style="list-style-type: none"> • Digital constants: digital constants are expressed in decimal, hexadecimal, or binary form. In a modem, the definition of each command specifies the format of the value associated with that command. • String constants: string constants consist of a series of characters, bounded by double quotation marks (") at the beginning and end. <p><compound_value> consists of multiple comma-separated parameters, for example: <value1>, <value2>, ... <valueN>.</p>
Read command	AT+xxx? ATxxx?	Returns the setting of the current command parameter.
Query command	AT+xxx=? ATxxx=?	Returns the parameter list of the command and the corresponding value range.

Result response

- Normal conditions: response information and result code.
- Abnormal conditions: error code, unsolicited return code, and response timeout.

By default, the modem responds with a detailed response code. The prefix and suffix of the result code are <CR> <LF>. For simplicity, the <CR> <LF> characters are not explicitly shown in the response format hereafter.



To reduce the print length, you can delete the empty lines in the actual response in the example.

1.3 Document Description

The command provides the following information:

Table 2. Command information

Field	Description
Description	Detailed description of command functions, scenarios, constraints, etc
Format	Explains the format of the command in each scenario.
Format	Explains the format of the command in each scenario.

Parameter	Describes the parameters of the command.
Example	Gives the actual operation log of the command

2 General Information

2.1 +CGMI, request manufacturer ID

Description

This command requests the the manufacturer identification. The module outputs a string containing manufacturer identification information.

Format

Type	Command	Response
Query command	AT+CGMI	<manufacturer> OK
Read current manufacturer information	AT+CGMI?	+CGMI: "<manufacturer >" OK
Query command parameter range	AT+CGMI=?	OK

Parameter

Name	Description	Value
manufacturer	Query manufacturer information of the product	A string containing manufacturer information

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CGMI ❶
Fibocom Wireless Inc.

OK
AT+CGMI? ❷
+CGMI: "Fibocom Wireless Inc."

OK
```

AT+CGMI=?**3**

OK

- ❶ Query manufacturer information.
- ❷ Confirm manufacturer information.
- ❸ Query command parameter range.

2.2 +GMI, request manufacturer ID

Description

This command requests the manufacturer information for a product. The module outputs a string containing manufacturer identification information.

Format

Type	Command	Response
Query command	AT+GMI	<manufacturer> OK
Read current manufacturer information	AT+GMI?	+GMI: "<manufacturer >" OK
Query command parameter range	AT+GMI=?	OK

Parameter

Name	Description	Value
manufacturer	Query manufacturer information of the product	A string containing manufacturer information

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GMI**❶**

Fibocom Wireless Inc.

OK

AT+GMI?**❷**

+GMI: "Fibocom Wireless Inc."

OK

AT+GMI=?

3

OK

- ① Query manufacturer information.
- ② Confirm manufacturer information.
- ③ Query command parameter range.

2.3 +CGMM, request model ID

Description

This command requests the model identification. The module outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Format

Type	Command	Response
Query command	AT+CGMM	<model> OK
Read current manufacturer information	AT+CGMM?	+CGMM: "<model>","<model abbrev>" OK
Query command parameter range	AT+CGMM=?	OK

Parameter

Name	Description	Value
model	Information text related to the model identification	A string containing information text related to the model identification
model abbrev	Short name related to the model identification	A string containing short name related to the model identification

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CGMM ❶
FG132-GL

OK

AT+CGMM? ❷
+CGMM: "FG132-GL", "FG132"

OK

AT+CGMM=? ❸
OK

```

❶ Query manufacturer information.

❷ Confirm manufacturer information.

❸ Query command parameter range.

2.4 +GMM, request model ID

Description

This command requests the model identification. The module outputs a string containing information about the specific model, including a list of the supported technology used, and the particular model number.

Format

Type	Command	Response
Query command	AT+GMM	<model> OK
Read current manufacturer information	AT+GMM?	+GMM: "<model>","<model abbrev>" OK
Query command parameter range	AT+GMM=?	OK

Parameter

Name	Description	Value
model	Information text related to the model identification	A string containing information text related to the model identification
model abbrev	Short name related to the model identification	A string containing short name related to the model identification

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
-------------------------	----	------------------------------	----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GMM 1
FG132-GL

OK
AT+GMM? 2
+GMM: "FG132-GL", "FG132"

OK
AT+GMM=? 3
OK

```

- 1 Query module model information.
- 2 Confirm module model information.
- 3 Query command parameter range.

2.5 +CGMR, request software revision

Description

This command requests the software revision identification. The module outputs a string containing the revision identification information of the software running on the device.

Format

Type	Command	Response
Query command	AT+CGMR	<revision> OK
Read current revision	AT+CGMR?	+CGMR: "<revision>" OK
Query command parameter range	AT+CGMR=?	OK

Parameter

Name	Description	Value
revision	Revision name	A string containing the revision name information

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CGMR ❶
89601.1000.00.03.02.02

OK
AT+CGMR? ❷
+CGMR: "89601.1000.00.03.02.02"

OK
AT+CGMR=? ❸
OK

```

- ❶ Request software revision.
- ❷ Confirm software revision.
- ❸ Query command parameter range.

2.6 +GMR, request revision

Description

This command requests the revision identification. The module outputs a string containing the revision identification information of the software running on the device.

Format

Type	Command	Response
Query command	AT+GMR	<revision> OK
Read current revision	AT+GMR?	+GMR: "<revision>" OK
Query command parameter range	AT+GMR=?	OK

Parameter

Name	Description	Value
------	-------------	-------

revision	Revision name	A string containing the revision name information	
Characteristic			
Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GMR 1
89601.1000.00.03.02.02

OK
AT+GMR? 2
+GMR: "89601.1000.00.03.02.02"

OK
AT+GMR=? 3
OK

```

- 1 Request software revision.
- 2 Confirm software revision.
- 3 Query command parameter range.

2.7 +CGSN, request IMEI

Description

This command displays the product serial number identification IMEI (International Mobile Equipment Identity). It can be used even when the SIM card is not inserted.

Format

Type	Command	Response
Query command	AT+CGSN[=<snt>]	<p>Response 1: When <snt>=0 (or omitted) and the command is successfully executed: <imei> OK</p> <p>Response 2: When <snt>=1 and the command is successfully executed:</p>

Type	Command	Response
		+CGSN: <imei> OK
		Response 3: When <snt>=2 and the command is successfully executed: +CGSN: <imeisv> OK
		Response 4: When <snt>=3 and the command is successfully executed: +CGSN: <svn> OK
		Response 5: ERROR
Read current settings	AT+CGSN?	+CGSN: "<imei>" OK
Query command parameter range	AT+CGSN=?	+CGSN: (list of supported <snt>s) OK
Parameter		
Name	Description	Value
snt	The serial number type that has been requested	Type: integer <ul style="list-style-type: none"> • 0: returns the IMEI(International Mobile station Equipment Identity) • 1: returns the IMEI(International Mobile station Equipment Identity) • 2: returns the IMEISV (International Mobile Equipment Identity and Software Version) • 3: returns the SVN (Software Version Number)
imei	Decimal format indicating the IMEI	Type: integer IMEI is composed of TAC (Type Allocation Code) (8 digits), SNR (Serial Number) (6 digits) and the CD (Check Digit) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS.

Name	Description	Value
imeisv	Decimal format indicating the IMEISV	Type: integer The 16 digits of IMEISV are composed of TAC (8 digits), SNR (6 digits) and the SVN (2 digits).
svn	Decimal format indicating the current SVN which is a part of IMEISV. This allows identifying different software versions of a given mobile.	- -

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CGSN=0 ❶
864835050001720
OK
AT+CGSN=1 ❷
+CGSN: 864835050001720
OK
AT+CGSN=2 ❸
+CGSN: 8648350500017215
OK
AT+CGSN=3 ❹
+CGSN: 15
OK
AT+CGSN? ❺
+CGSN: "864835050001720"
OK
AT+CGSN=? ❻
+CGSN: (0-3)
OK

```

- ❶ Return the IMEI.
- ❷ Return the IMEI.
- ❸ Return the IMEISV.

- ④ Return the SVN.
- ⑤ Query the IMEI.
- ⑥ Query available parameters and ranges.

2.8 +GSN, request IMEI

Description

This command displays the product serial number identification IMEI (International Mobile Equipment Identity). It can be used even when the SIM card is not inserted.

Format

Type	Command	Response
Query command	AT+GSN[=<snt>]	<p>Response 1: When <snt>=0 (or omitted) and the command is successfully executed: <imei> OK</p> <p>Response 2: When <snt>=1 and the command is successfully executed: +GSN: <imei> OK</p> <p>Response 3: When <snt>=2 and the command is successfully executed: +GSN: <imei> OK</p> <p>Response 4: When <snt>=3 and the command is successfully executed: +GSN: <svn> OK</p> <p>Response 5: ERROR</p>
Read current settings	AT+GSN?	+GSN: "<imei>" OK
Query command parameter range	AT+GSN=?	+GSN: (list of supported <snt>s) OK

Parameter

Name	Description	Value
snt	The serial number type that has been requested	Type: integer <ul style="list-style-type: none"> • 0: returns the IMEI • 1: returns the IMEI • 2: returns the IMEISV (International Mobile Equipment Identity and Software Version) • 3: returns the SVN (Software Version Number)
imei	Decimal format indicating the IMEI	Type: integer IMEI is composed of TAC (Type Allocation Code) (8 digits), SNR (Serial Number) (6 digits) and the CD (Check Digit) (1 digit). Character set used in <imei> is as specified by command Select TE Character Set +CSCS.
imeisv	Decimal format indicating the IMEISV	Type: integer The 16 digits of IMEISV are composed of TAC (8 digits), SNR (6 digits) and the SVN (2 digits).
svn	Decimal format indicating the current SVN which is a part of IMEISV. This allows identifying different software versions of a given mobile.	--

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GSN=0 1
864835050001720

OK
AT+GSN=1 2
+GSN: 864835050001720

OK

```

```
AT+GSN=2 ③
+GSN: 8648350500017215

OK

AT+GSN=3 ④
+GSN: 15

OK

AT+GSN? ⑤
+GSN: "864835050001720"

OK

AT+GSN=? ⑥
+GSN: (0-3)

OK
```

- ① Return the IMEI.
- ② Return the IMEI.
- ③ Return the IMEISV.
- ④ Return the SVN.
- ⑤ Query the IMEI.
- ⑥ Query available parameters and ranges.

2.9 +CFSN, request factory serial number

Description

This command is used to read production serial number.

Format

Type	Command	Response
Query command	AT+CFSN	Response 1: +CFSN: <FSN> OK
		Response 2: ERROR
Read current settings	AT+CFSN	+CFSN: <FSN> OK

Parameter

Name	Description	Value
------	-------------	-------

FSN	Factory serial number	Type: string String with ten characters, each character can be <A-Z> or <0-9>, for example, "1234567890".
-----	-----------------------	--

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CFSN 1
+CFSN: "N152LG0053"

OK

AT+CFSN? 2
+CFSN: "N152LG0053"

OK

1 Read current factory serial number.

2 Read current factory serial number.

2.10 I, query identification information

Description

This command is used to query version, manufacturer and model information.

Format

Type	Command	Response
Read current settings	ATI[<n>]	<n> omitted Response depends on product <n>=0 Version build time <n>=1 or 2 or 4 or 5 or 6 Reserved <n>=3 Product description, such as "FG132" <n>=7 Product description, such as "FG132-GL-00" <n>=8

Type	Command	Response
		Software version <n>=9 Hardware version ERROR

Parameter

Name	Description	Value
n	Serial number	Type: integer Range: 0 to 9

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example**ATI**

Manufacturer: Fibocom Wireless Inc.

Model: FG132-GL

Revision: 19003.1000.00.02.01.19

SVN: 01

IMEI: 864835050001720

+GCAP: +CGSM

OK

2.11 +CIMI, request IMSI

Description

This command displays the IMSI (International Mobile Subscriber Identity) number.

Format

Type	Command	Response
Query command	AT+CIMI	<IMSI> OK
Read current settings	AT+CIMI?	+CIMI: <IMSI> OK

Parameter

Name	Description	Value
IMSI	International Mobile Subscriber Identity	Type: string

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example**AT+CIMI** ①

460009821929812

OK

AT+CIMI? ②

+CIMI: 460009821929812

OK

① Display the IMSI number.

② Display the IMSI number.

2.12 +CCID, request integrate circuit card identity

Description

This command returns the card identification number in the SIM card.

Format

Type	Command	Response
Query command	AT+CCID	Response 1: +CCID: <ID> OK Response 2: ERROR
Read current settings	AT+CCID?	+CCID: <ID> OK
Read current settings	AT+CCID=?	OK

Parameter

Name	Description	Value
ID	Integrated circuit card identifier (string without double quotes)	Type: string

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CCID 1  
+CCID: 89860000191988755034  
  
OK  
AT+CCID? 2  
+CCID: 89860000191988755034  
  
OK  
AT+CCID=? 3  
OK
```

- 1 Return the card identification number in the SIM card.
- 2 Return the card identification number in the SIM card.
- 3 Query command parameter range.

2.13 +GTUSIM, check USIM card

Description

This command checks the type of SIM card currently in use.

Format

Type	Command	Response
Query command	AT+GTUSIM	Response 1: +GTUSIM: <state> OK Response 2: ERROR

Read current settings	AT+GTUSIM?	Response 1: +GTUSIM: <state> OK Response 2: ERROR
-----------------------	------------	---

Parameter

Name	Description	Value
state	SIM card type	Type: integer • 0: SIM (for GSM) • 1: USIM (for WCDMA, TD-SCDMA, and LTE)

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+GTUSIM ①
+GTUSIM: 1
OK
AT+GTUSIM? ②
+GTUSIM: 1
OK
```

① Query the type of SIM card currently in use.

② Query the type of SIM card currently in use.

2.14 +CMEE, report mobile termination error

Description

This command is used to report errors related to the module.

Format

Type	Command	Response
Setting command	AT+CMEE=[<n>]	Response 1: OK

		Response 2: ERROR Do not change the original settings if: AT+CMEE=
Read current settings	AT+CMEE?	+CMEE: <n> OK
Query command parameter range	AT+CMEE=?	+CMEE: (list of supported <reason>s) OK

Parameter

Name	Description	Value
n	Disable or enable +CME	Type: integer <ul style="list-style-type: none"> 0: Disable +CME ERROR: <err> and CMS ERROR<err> reporting function (default). 1: Enable +CME ERROR: <err> +CMS ERROR: <err> results reporting and use numeric values or +STK<err>: result code. 2: Enable +CME ERROR: <err> +CMS ERROR: <err> results reporting and use detailed values or +STK<err>: result code.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CMEE=?      ❶
+CMEE: (0-2)

OK

AT+CMEE?      ❷
+CMEE: 0

OK

AT+CMEE=2     ❸
OK

```


AT+CMEE=1 ④

OK

AT+CMEE=0 ⑤

OK

- ① Query available parameters and ranges.
- ② Confirm current mobile equipment status.
- ③ Enable +CME ERROR<err>.
- ④ Enable +CME ERROR<err>.
- ⑤ Disable +CME ERROR<err>.

2.15 +CEER, extended error report

Description

This execution command returns an extended error report containing one or more lines of information text <report>, determined by the manufacturer, providing reasons for the following errors:

- Failure in the last unsuccessful call setup (originating or answering) or the in-call modification.
- Last call release.

Typically, the text consists of a single line containing the reason for the error according to information given by GSM network, in textual format.

Format

Type	Command	Response
Setting command	AT+CEER	+CEER: <category>[,<cause>,<description >] OK
Query command parameter range	AT+CEER=?	OK

Parameter

Name	Description	Value
category	Error category	Type: string <ul style="list-style-type: none"> • No report available • CC: setup error • CC: modification error • CC: release • SM: attach error • SM: detach • SM: activation error • SM: deactivation • SS: network error cause

		<ul style="list-style-type: none"> • SS: network reject cause • SS: network GSM cause
cause	Contains a digit representing the error cause sent by network or internally.	- -
description	Contains the textual representation of the cause.	Type: string

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CEER 1
+CEER: <category>[,<cause>,< description >]

OK

AT+CEER=? 2

OK

```

1 Query error report.

2 Query command parameter range.

3 Module Control and Status

3.1 AT, detect AT connection

Description

Only OK is returned after sending this command.

Format

Type	Command	Response
Setting command	AT	OK

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	500	Max Result Returning Duration (ms)	500

Example

```
AT ①  
OK
```

① Setting command

3.2 V, module response format

Description

This command sets the format of the AT command return code and the return information field, including the composition of the header and tailer, and the internal form of the return result code. The command also determines whether the result code is transmitted in numeric or alphabetic ("verbose") form. The text portion of the message response is not affected by this setting.

Format

Type	Command	Response
Setting command	ATV[<value>]	Response 1: <value>=0 <numeric code> Response 2: <value>=1 or no parameters <verbose code>

Read current settings	ATV?	<value>
		OK

Parameter

Name	Description	Value
value	Value of data format	Type: integer <ul style="list-style-type: none"> • 0: MT sends abbreviated header and trailer, numeric text • 1: MT sends full header and trailer with result code in detailed string (default)
numeric code	Numeric text value	Type: integer <ul style="list-style-type: none"> • 0: OK • 1: CONNECT • 2: RING • 3: NO CARRIER • 4: ERROR • 5: RESERVED • 6: NO DIALTONE • 7: BUSY • 8: NO ANSWER
verbose code	String result code	Type: string <ul style="list-style-type: none"> • OK • CONNECT • RING • NO CARRIER • ERROR • RESERVED • NO DIALTONE • BUSY • NO ANSWER

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
ATV00 ①

ATD<phone number>;03 ②

ATD<phone number>;08 ③

ATV1 ④
OK

ATD<phone number>; ⑤
OK

NO ANSWER
```

- ① Set to numeric text output
- ② The dialed call was hung up
- ③ The dialed call has no answer
- ④ Set to string output
- ⑤ The dialed call has no answer

3.3 Q, result code suppression

Description

This command determines whether to output the result codes. Information text transmitted in response to the command is not affected by the settings of this parameter.

Format

Type	Command	Response
Setting command	ATQ[<value>]	Response 1: OK
		Response 2: ERROR
		Response 3: Null If <value>=1
Read current settings	ATQ?	<value>

OK

Parameter

Name	Description	Value
value	Indicates whether to output the result code	Type: integer <ul style="list-style-type: none"> • 0: Send result code (default value). • 1: Do not send result code.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example**ATQ2** ❶

ERROR

ATQ0 ❷

OK

ATQ1 ❸

❶ Incorrect parameter settings.

❷ Set to send result code.

❸ Set not to send result code.

3.4 E, command echo

Description

This command defines whether input characters are echoed to the output. If so, the characters will echo at the same rate, parity, and format as they were received.

Format

Type	Command	Response
Setting command	ATE<n>	Response 1: OK Response 2: ERROR

Type	Command	Response
Read current settings	ATE?	<value>
		OK

Parameter

Name	Description	Value
n	Indicates echo or not	Type: integer <ul style="list-style-type: none"> 0: disable echo 1: enable echo
value	Test echo return value	Type: integer <ul style="list-style-type: none"> 000: disable echo 001: enable echo (default value) No parameter is equivalent to <value>=0.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

ATE2      ❶
ERROR

ATE?      ❷
001

OK

ATE0      ❸
OK

```

- ❶ Incorrect parameter settings.
- ❷ Query echo.
- ❸ Disable echo.

3.5 +MSMPD, disable/enable SIM card hot plug

Description

This command enables or disables the SIM card hot plug function. This function is enabled by default. This parameter is saved in NVM and can be restored after reboot.

Format

Type	Command	Response
Setting command	AT+MSMPD=<status>	Response 1: OK Response 2: ERROR
Read current settings	AT+MSMPD?	+MSMPD: <status> OK
Query command parameter range	AT+MSMPD=?	+MSMPD: (list of supported <status>s) OK

Parameter

Name	Description	Value
status	SIM card hot plug function status	Type: integer <ul style="list-style-type: none"> • 0: Disable the SIM card hot plug function • 1: Enable the SIM card hot plug function(default value) • Note: The settings may be reset to default value after firmware upgrade.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MSMPD? ①

+MSMPD: 1

OK

AT+MSMPD=? ②

+MSMPD: (0,1)

OK

AT+MSMPD=0 ③

OK

- ❶ Read current SIM card hot plug settings.
- ❷ Query command parameter range.
- ❸ Set to disable the SIM card hot plug function.

3.6 +SIMSWAPCFG, set the detection level of the SIM CD

Description

This command is used to set the detection level of the SIM CD to ensure that the insertion and removal of the SIM is correctly recognized. By default, SIM is inserted when SIM CD is high.

The parameters will be saved in NVM at power down.

Format

Type	Command	Response
Setting command	AT+SIMSWAPCFG =<status>	Response 1: OK Response 2: ERROR
Read current settings	AT+SIMSWAPCFG?	+SIMSWAPCFG: <status> OK
Query command parameter range	AT+SIMSWAPCFG=?	+SIMSWAPCFG: (list of supported <status>s) OK

Parameter

Name	Description	Value
status	Level of the SIM CD to detect whether the SIM is inserted	Type: integer 0: SIM is inserted when the level is low 1: SIM is inserted when the level is high (default value) Note: The settings may be reset to default value after firmware upgrade.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example**AT+SIMSWAPCFG?**

①

+SIMSWAPCFG: 1

OK

AT+SIMSWAPCFG=?

②

+SIMSWAPCFG: (0,1)

OK

AT+SIMSWAPCFG=0

③

OK

① Read current settings.

② Query command parameter range.

③ Set to the SIM is inserted when the level is low.

3.7 +CPWROFF, switch off MS

Description

This command is used to switch off and detach modules.

Format

Type	Command	Response
Setting command	AT+CPWROFF	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CPWROFF=?	OK

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	3000	Max Result Returning Duration (ms)	10000



After shutting down the module, there is no command output. It is recommended to wait for 10 seconds after receiving "OK" before cutting off the power to the module.

Example

```
AT+CPWROFF=?
```

```
OK
```

```
AT+CPWROFF
```

```
OK
```

3.8 +CFUN, set module functionality

Description

This command is used to select the level of functionality in the module.

Format

Type	Command	Response
Setting command	AT+CFUN=<fun>[,<rst>]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CFUN?	Response 1: +CFUN: <fun>,<STK_mode>
		OK
		Response 2: ERROR
Query command parameter range	AT+CFUN=?	Response 1: +CFUN: (list of supported <fun>s),(list of supported <rst>s)
		OK
		Response 2: ERROR

Parameter

Name	Description	Value
------	-------------	-------

Name	Description	Value
fun	Indicates the functions	Type: integer <ul style="list-style-type: none"> • 0: Minimum level function (disable MS and perform de-attach process). • 1: Complete function. Enable transmit and receive RF signals for all supported radio access technologies (online mode). • 4: Disable MT to transmit and receive RF signals (flight mode) • 5: Factory test mode. • 15: Reset(<Rst> is not supported when <fun>=15.) When the <fun> value is 0 or 15, the OK response may be missed due to race conditions. Whether the value of <fun> is power-down saved also depends on the implementation of the target product.
rst	--	Type: integer <ul style="list-style-type: none"> • 0: Do not reset MT before setting power level of <fun>. • 1: Reset MT before setting power level of <fun>.
STK_mode	--	<ul style="list-style-type: none"> • 0: Invalid state (default) • 6: Enable SIM STK and active command extraction • 7: Disable SIM STK and enable extract active command • 8: Disable obtain active command

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	3000	Max Result Returning Duration (ms)	10000

Example

AT+CFUN?

①

+CFUN: 1,0

OK

AT+CFUN=? ^②
 +CFUN: (0,1,4,5,15),(0,1)

OK

AT+CFUN=0 ^③
 OK

- ① Read current settings.
- ② Query command parameter range.
- ③ Disable MS and perform de-attach process).

3.9 +MSTART, start message notification

Description

This command is used to enable or disable module outputting starting message when power up.

Format

Type	Command	Response
Setting command	AT+MSTART=<at ready>,<sim ready>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+MSTART?	+MSTART: <at ready>,<sim ready> OK
Query command parameter range	AT+MSTART=?	+MSTART: (list of supported <at ready>s),(list of supported <sim ready>s) OK

Parameter

Name	Description	Value
at ready	--	Type: integer <ul style="list-style-type: none"> 0: Do not output "AT command ready" from UART 1: Output "AT command ready" from UART (default value)
sim ready	--	Type: integer <ul style="list-style-type: none"> 0: Do not output "+SIM READY" after phonebook initialize completely 1: Output "+SIM READY" after phonebook initialize

Name	Description	Value
		completely (default value)
		"AT command ready" is not allowed to be output from USB port even if the value is set to 1. "+SIM READY" can output from UART and USB port according to setting.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MSTART? ①

+MSTART: 1,1

OK

AT+MSTART=? ②

+MSTART: (0,1),(0,1)

OK

AT+MSTART=1,0 ③

OK

① Read current settings.

② Query command parameter range.

③ Do not output "+SIM READY" after phonebook initialize completely.

3.10 +GTDUALSIM, dual SIM card switching

Description

This command is used to switch carrier SIM cards. AT+GTDUALSIM? is used for inquiring the SIM card information of the current carrier. AT+GTDUALSIM is used to read the information of all available SIM cards of the carrier. If it is in dual card mode, the information of two cards will be returned. Otherwise, the device is configured in single card mode and the information of one SIM card will be returned.



For the module with dual sim card and single standby mode, please switch the sim card and wait until the original sim card is lost or disconnected, the new SIM card is activated, and the card is operated after the network is completed.

Format

Type	Command	Response
Setting command	AT+GTDUALSIM=<sim_app>	Response 1: OK Response 2: +ERROR
Read current settings	AT+GTDUALSIM?	Response 1: +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode> OK Response 2: +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>[<CR><LF> +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>] OK
Execute command	AT+GTDUALSIM	Response 1: +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>[<CR><LF> +GTDUALSIM: <sim_app>,<sub_app>,<sys_mode>] OK
Query command parameter range	AT+GTDUALSIM=?	+GTDUALSIM: (list of supported <sim_app>s) OK

Parameter

Name	Description	Value
sim_app	Carrier SIM id	Type: integer 0: SIM1 (default value) 1: SIM2
sub_app	Card slot id	Type: integer SUB1: slot 1 SUB2: slot 2

Name	Description	Value
sys_mode	Current system mode	Type: string No Service: no service N: NR service L: LTE service

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	3000	Max Result Returning Duration (ms)	3000

Example

```
AT+GTDUALSIM? ❶
+GTDUALSIM: 0,"SUB1","N"
+GTDUALSIM: 1,"SUB2","No Service"
```

OK

```
AT+GTDUALSIM ❷
+GTDUALSIM: 0,"SUB1","No Service"
```

OK

```
AT+GTDUALSIM=? ❸
+GTDUALSIM: (0,1)
```

OK

```
AT+GTDUALSIM =1 ❹
OK
```

- ❶ Read current settings
- ❷ Read current settings, single card mode
- ❸ Query command parameter range
- ❹ Set to SIM mode

4 Sleep

4.1 +GTWAKE, enable wake-up host function

Description

This command is used to enable or disable wake up host function.

Format

Type	Command	Response
Setting command	AT+GTWAKE=<mode>[,<sub_mode>]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTWAKE?	+GTWAKE: <mode>[,<sub_mode>] OK
Query command parameter range	AT+GTWAKE=?	+GTWAKE: (list of supported <mode>s),(list of supported <sub_mode>s) OK

Parameter

Name	Description	Value
mode	Indicates the mode	Type: integer <ul style="list-style-type: none"> 0: Disable wake up host function (default) 2: Enable wake up host function through UART RI pin
sub_mode	- -	Type: integer <ul style="list-style-type: none"> 0: The module sets the RI pin high when the host is to be waked up (default value). 1: The module sets the RI pin low when the host is to be waked up. (RI pulse signal, defined according to WRIM)

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take	No	Require Data Store at Power Down	No

Effect

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

AT+GTWAKE? ❶

+GTWAKE: 0,0

OK

AT+GTWAKE=? ❷

+GTWAKE: (0, 2),(0, 1)

OK

AT+GTWAKE=2,0 ❸

OK

❶ Read current settings.

❷ Query command parameter range.

❸ Set the wake up host function enabled through the RI pin.

4.2 +GTLPMODE, set wake-up and sleep modes

Description

This command controls how the module goes to sleep or wakes up from sleep.

Format

Type	Command	Response
Setting command	+GTLPMODE=<main_mode>[,<sub_mode>]	Response 1: OK Response 2: ERROR
Read current settings	AT+GTLPMODE?	Response 1: +GTLPMODE: <main_mode>[,<sub_mode>] OK Response 2: ERROR
Query command parameter range	AT+GTLPMODE=?	+GTLPMODE: (list of supported <main_mode>s),(list of supported <sub_mode>s) OK

Parameter

Name	Description	Value
main_mode	Indicates the mode	Type: integer <ul style="list-style-type: none"> 0: Cancel pin control module sleep/wake mode, exit sleep mode. 1: Control the module enters the sleep or wake-up mode only through the level of the WAKEUP_IN pin. 2: Control the module enters the sleep or wake-up mode only through the level of the UART DTR pin.
sub_mode	--	Type: integer <ul style="list-style-type: none"> 0: When the WAKEUP_IN or DTR pin goes high, the module enters sleep mode and it is waked up with low level. 1: When the WAKEUP_IN or DTR pin goes low, the module enters sleep mode and it is waked up with high level.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTLPMODE? ①

+GTLPMODE: 0

OK

AT+GTLPMODE=? ②

+GTLPMODE: (0-2), (0,1)

OK

AT+GTLPMODE=1,0 ③

OK

① Read current settings.

② Query command parameter range.

③ Set to use the WAKEUP_IN to control the module to enter sleep.

4.3 +GTPMTIME, delay time for sending data

Description

This command controls the delay time for sending data.

Format

Type	Command	Response
Setting command	+GTPMTIME=<delay-out>[,<delay-in>[,<sleeptime>]]	Response 1: OK Response 2: ERROR
Read current settings	AT+GTPMTIME?	+GTPMTIME: <delay-out>,<delay-in>,<sleeptime> OK
Query command parameter range	AT+GTPMTIME=?	+GTPMTIME: (100-1000),(100-1000),(1000-5000) OK

Parameter

Name	Description	Value
delay-out	Indicates the delay time	Type: integer Range: 100ms to 1000ms Default value: 200ms After the host signal wake-up is set, the module waits for this delay time to send data.
delay-in	Indicates the delay time	Type: integer Range: 100ms to 1000ms Default value: 200ms After the host signal wake-up is set, the module waits for this delay time to send data.
sleeptime	Indicates the sleep time of the module	Type: integer Range: 1000ms to 5000ms Default value: 2000ms The module enters sleep mode after being pulsed awake via the WAKEUP/DTR pin.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+GTPMTIME? ❶
+GTPMTIME: 200,200,2000

OK
AT+GTPMTIME=? ❷
+GTPMTIME: (100-1000),(100-1000),(1000-5000)

OK
AT+GTPMTIME=300 ❸
OK
```

- ❶ Read current settings.
- ❷ Query command parameter range.
- ❸ Set the delay time to 300ms.



- 1. The delay-in parameter function is currently not supported.
- 2. The delay-out parameter delay data transmission function is currently not supported, only supporting RI pin output pulse waveform to wake up the host.

5 Network

5.1 +CSQ, signal strength

Description

This command displays the received signal strength indication <rssi> and channel bit error rate <ber> from the module.

Format

Type	Command	Response
Setting command	AT+CSQ	+CSQ: <rssi>,<ber> OK
Read current settings	AT+CSQ?	+CSQ: <rssi>,<ber> OK
Query command parameter range	AT+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s) OK

Parameter

Name	Description	Value
rssi	integer type	Type: integer <ul style="list-style-type: none"> 0: -113 dBm or less 1: -111 dBm 2...30: -109... -53 dBm 31 : -51dBm or greater 99: not known or not detectable
ber	integer type	Type: integer <ul style="list-style-type: none"> 0...7: as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 99: not known or not detectable

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

```
AT+CSQ ①
+CSQ: 6, 99

OK

AT+CSQ? ②
+CSQ: 7, 99

OK

AT+CSQ=? ③
+CSQ: (0-31,99),(0-7,99)

OK
```

- ① Setting command.
- ② Read current command.
- ③ Query command parameter range.

5.2 +CESQ, extended signal quality

Description

Executing the command returns the signal quality parameters received by the device.

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

Format

Type	Command	Response
Setting command	AT+CESQ	Response 1: +CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<ss _rsrq>,<ss_rsrp>,<ss_sinr> OK Response 2: ERROR

Type	Command	Response
Query command parameter range	AT+CESQ=?	+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s),(list of supported <ss_rsrq>s),(list of supported <ss_rsrp>s),(list of supported <ss_sinr>s) OK

Parameter

Name	Description	Value
rxlev	Received signal strength level (see 3GPP TS 45.008 sub-clause 8.1.4)	Type: integer <ul style="list-style-type: none"> 0: $\text{rssi} < -110 \text{ dBm}$ 1: $-110 \text{ dBm} \leq \text{rssi} < -109 \text{ dBm}$ 2: $-109 \text{ dBm} \leq \text{rssi} < -108 \text{ dBm}$... 61: $-50 \text{ dBm} \leq \text{rssi} < -49 \text{ dBm}$ 62: $-49 \text{ dBm} \leq \text{rssi} < -48 \text{ dBm}$ 63: $-48 \text{ dBm} \leq \text{rssi}$ 99: unknown or not defined
ber	Channel bit error rate (in percent)	Type: integer <ul style="list-style-type: none"> 0-7: as RXQUAL values in the table in 3GPP TS 45.008 sub-clause 8.2.4 99: unknown or not detected
rscp	Received signal code strength (see 3GPP TS 25.133 sub-clause 9.1.1.3 and 3GPP TS 25.123 sub-clause 9.1.1.1.3)	Type: integer <ul style="list-style-type: none"> 0: $\text{rscp} < -120 \text{ dBm}$ 1: $-120 \text{ dBm} \leq \text{rscp} < -119 \text{ dBm}$ 2: $-119 \text{ dBm} \leq \text{rscp} < -118 \text{ dBm}$... 94: $-27 \text{ dBm} \leq \text{rscp} < -26 \text{ dBm}$ 95: $-26 \text{ dBm} \leq \text{rscp} < -25 \text{ dBm}$ 96: $-25 \text{ dBm} \leq \text{rscp}$ 255: unknown or not defined
ecno	Ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 sub-clause).	Type: integer <ul style="list-style-type: none"> 0: $\text{Ec/Io} < -24 \text{ dB}$ 1: $-24 \text{ dB} \leq \text{Ec/Io} < -23.5 \text{ dB}$ 2: $-23.5 \text{ dB} \leq \text{Ec/Io} < -23 \text{ dB}$

Name	Description	Value
		<ul style="list-style-type: none"> • ... • 47: $-1 \text{ dB} \leq E_c/I_o < -0.5 \text{ dB}$ • 48: $-0.5 \text{ dB} \leq E_c/I_o < 0 \text{ dB}$ • 49: $0 \text{ dB} \leq E_c/I_o$ • 255: unknown or not defined
rsrp	Received signal power (see 3GPP TS 36.133 sub-clause 9.1.4)	Type: integer <ul style="list-style-type: none"> • 0: $\text{rsrp} < -140 \text{ dBm}$ • 1: $-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$ • 2: $-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$ • ... • 95: $-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$ • 96: $-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$ • 97: $-44 \text{ dBm} \leq \text{rsrp}$ • 255 Not known or not detectable
rsrq	Received signal quality (see 3GPP TS 36.133 sub-clause 9.1.7)	Type: integer <ul style="list-style-type: none"> • 0: $\text{rsrq} < -19.5 \text{ dB}$ • 1: $-19.5 \text{ dB} \leq \text{rsrq} < -19 \text{ dB}$ • 2: $-19 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$ • ... • 32: $-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$ • 33: $-3.5 \text{ dB} \leq \text{rsrq} < -3 \text{ dB}$ • 34: $-3 \text{ dB} \leq \text{rsrq}$ • 255: unknown or not defined
ss_rsrq	integer type, synchronization signal-based reference signal received quality (see 3GPP TS 38.133 [169] subclause 10.1.11)	<ul style="list-style-type: none"> • 0 $\text{ss_rsrq} < -43 \text{ dB}$ • 1 $-43 \text{ dB} \leq \text{ss_rsrq} < -42.5 \text{ dB}$ • 2 $-42.5 \text{ dB} \leq \text{ss_rsrq} < -42 \text{ dB}$ • ... • 124 $18.5 \text{ dB} \leq \text{ss_rsrq} < 19 \text{ dB}$ • 125 $19 \text{ dB} \leq \text{ss_rsrq} < 19.5 \text{ dB}$ • 126 $19.5 \text{ dB} \leq \text{ss_rsrq} < 20 \text{ dB}$ • 255 not known or not detectable
ss_rsrp	integer type, synchronization signal based reference signal received power (see 3GPP TS 38.133 [169] subclause 10.1.6)	<ul style="list-style-type: none"> • 0 $\text{ss_rsrp} < -156 \text{ dBm}$ • 1 $-156 \text{ dBm} \leq \text{ss_rsrp} < -155 \text{ dBm}$ • 2 $-155 \text{ dBm} \leq \text{ss_rsrp} < -154 \text{ dBm}$ • ... • 125 $-32 \text{ dBm} \leq \text{ss_rsrp} < -31 \text{ dBm}$

Name	Description	Value
		<ul style="list-style-type: none"> 126 -31 dBm ≤ ss_rsrp 255 Not known or not detectable
ss_sinr	integer type, synchronization signal based signal to noise and interference ratio (see 3GPP TS 38.133 [169] clause 10.1.16).	<ul style="list-style-type: none"> 0 ss_sinr < -23 dB 1 -23 dB ≤ ss_sinr < -22.5 dB 2 -22.5 dB ≤ ss_sinr < -22 dB ... 125 39 dB ≤ ss_sinr < 39.5 dBm 126 39.5 dB ≤ ss_sinr < 40 dB 127 40 dB ≤ ss_sinr 255 Not known or not detectable

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CESQ

①

+CESQ: 47,99,255,255,255,255,61,64,47

OK

AT+CESQ=?

②

+CESQ:

(0-63,99),(0-7,99),(0-96,255),(0-49,255),(0-34,255),(0-97,255),(0-126,255),(0-126,255),(0-127,255)

OK

① Setting command.

② Query command parameter range.

5.3 +CREG, Network registration status

Description

The command is as follows:

- +CREG: When <n>=1 and the CS domain registration status of the MT changes in GERAN/UTRAN/E-UTRAN, the changed value is reported.

- +CREG: When $\langle n \rangle = 2$ and there is a change of the network cell in GERAN/UTRAN/E-UTRAN, the parameters $\langle \text{stat} \rangle$, $\langle \text{lac} \rangle$, $\langle \text{ci} \rangle$, and $\langle \text{AcT} \rangle$ are reported only if available.
- +CREG: When $\langle n \rangle = 3$ and the value of $\langle \text{stat} \rangle$ changes, the parameters $\langle \text{lac} \rangle$, $\langle \text{ci} \rangle$, $\langle \text{AcT} \rangle$, $\langle \text{cause_type} \rangle$, and $\langle \text{reject_cause} \rangle$ are reported.

The command reads the state of the MT registration network and displays an integer $\langle \text{stat} \rangle$ that shows whether the network has currently indicated the registration of the MT. Location information elements $\langle \text{lac} \rangle$, $\langle \text{ci} \rangle$ and $\langle \text{AcT} \rangle$, if available, are returned only when $\langle n \rangle = 2$ and MT is registered in the network. The parameters $[\langle \text{cause_type} \rangle, \langle \text{reject_cause} \rangle]$, if available, are returned when $\langle n \rangle = 3$.

Format

Type	Command	Response
Setting command	AT+CREG=[$\langle n \rangle$]	Response 1: OK Response 2: ERROR
Read current settings	AT+CREG?	+CREG: $\langle n \rangle, \langle \text{stat} \rangle, [\langle \text{lac} \rangle, \langle \text{ci} \rangle, \langle \text{AcT} \rangle, \langle \text{cause_type} \rangle, [\langle \text{reject_cause} \rangle]]$ OK
Query command parameter range	AT+CREG=?	+CREG: (list of supported $\langle n \rangle$ s) OK



CREG, CEREg, CGREG, C5GREG, registered under LTE and NR, will display the same registration information and cell information

Parameter

Name	Description	Value
n	Used to set the return value when reading the command	Type: integer <ul style="list-style-type: none"> • 0: disables network registration unsolicited result code (default value). • 1: enables network registration unsolicited result code +CEREg: $\langle \text{stat} \rangle$. • 2: enables network registration and location information unsolicited result code +CEREg: $\langle \text{stat} \rangle, [\langle \text{lac} \rangle, \langle \text{ci} \rangle, \langle \text{AcT} \rangle]$. • 3: enables network registration, location information and EMM cause value information unsolicited result code +CEREg: $\langle \text{stat} \rangle, [\langle \text{lac} \rangle, \langle \text{ci} \rangle, \langle \text{AcT} \rangle], \langle \text{cause_type} \rangle, \langle \text{reject_cause} \rangle$

Name	Description	Value
		>]].
stat	Registration status	Type: integer <ul style="list-style-type: none"> • 0: not registered, MT is not currently searching an operator to register to. • 1: registered, local network • 2: not registered, MT is currently trying to attach or searching an operator to register to. • 3: registration denied • 4: unknown, for example, out of GERAN/UTRAN/E-UTRAN coverage. • 5: registered, roaming network
stat	Registration status	Type: integer <ul style="list-style-type: none"> • 6: registered for "SMS only", local network (applicable only when <AcT> indicates E-UTRAN). • 7: registered for "SMS only", roaming network (applicable only when <AcT> indicates E-UTRAN). • 8: attached for emergency bearer services only (not applicable). For details, see NOTE 2. • 9: registered for "CSFB not preferred", local network (applicable only when <AcT> indicates E-UTRAN). • 10: registered for "CSFB not preferred", roaming network (applicable only when <AcT> indicates E-UTRAN).
lac	In hexadecimal format (for example, "00C3" equals 195 in decimal).	Type: string
ci	Cell ID in hexadecimal format.	Type: string
AcT	<ul style="list-style-type: none"> • Indicates the access technology type 	<ul style="list-style-type: none"> • Type: integer • 0: GSM • 1: GSM Compact • 2: UTRAN • 3: GSM w/EGPRS (see NOTE 1) • 4: UTRAN w/HSDPA (see NOTE 2) • 5: UTRAN w/HSUPA (see NOTE 2) • 6: UTRAN w/HSDPA and HSUPA (see NOTE 2) • 7: E-UTRAN • 11 NR connected to a 5G CN • • 3GPP TS 44.060 [71] specifies the System Information

Name	Description	Value
		messages which give the information about whether the serving cell supports EGPRS. 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
cause_type	Indicates the type of <reject_cause>.	Type: integer <ul style="list-style-type: none"> • 0: Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G. • 1: indicates that <reject_cause> contains a manufacturer-specified cause.
reject_cause	Contains the cause of the failed registration. The value type is defined by <cause_type>.	Type: integer

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CREG=2           ❶
OK
AT+CREG?           ❷
+CREG: 2,1,"90F3","0123F0C8",7

OK
AT+CREG=?          ❸
+CREG: (0-3)

OK

```

- ❶ Setting command.
- ❷ Read current settings.
- ❸ Query command parameter range.

5.4 +CGREG, GPRS network registration

Description

The setting command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status in GERAN/UTRAN, or unsolicited result code +CGREG: <stat>[,<lac>],[<ci>],[<AcT>],[<rac>]] when <n>=2 and there is a change of the network cell in GERAN/UTRAN. The parameters <AcT>, <lac>, <rac> and <ci> are provided only if available. When the value of <stat> changes, and the value <n>=3, the values of [,<cause_type>,<reject_cause>] are provided.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>, <ci>, <AcT> and <rac>, if available, are returned only when <n>=2 and MT is registered in the network. Test command returns the range of supported network registration mode (that is, <n>).

Format

Type	Command	Response
Setting command	AT+CGREG=[<n>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGREG?	+CGREG: <n>,<stat>[,<lac>],[<ci>],[<AcT>],[<rac>],[<cause_type>,<reject_cause>]] OK
Query command parameter range	AT+CGREG=?	+CGREG: (list of supported <n>s) OK



CREG, CEREg, CGREG, C5GREG, registered under LTE and NR, will display the same registration information and cell information

Parameter

Name	Description	Value
n	Used to set the return value when reading the command	Type: integer <ul style="list-style-type: none"> • 0: disables network registration unsolicited result code (default value). • 1: enables network registration unsolicited result code +CGREG: <stat>. • 2: enables network registration and location information unsolicited result code +CGREG: <stat>[,<lac>],[<ci>],[<AcT>]]. • 3: enables network registration, location information and GMM cause value information unsolicited result

Name	Description	Value
		code +CGREG: <stat>[[<lac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]].
stat	Indicates the GPRS registration status	<ul style="list-style-type: none"> • Type: integer • 0: not registered, MT is not currently searching an operator to register to. • 1: registered, local network • 2: not registered, MT is currently trying to attach or searching an operator to register to. • 3: registration denied • 4: unknown, for example, out of GERAN/UTRAN/E-UTRAN coverage. • 5: registered, roaming network • 6: registered for "SMS only", local network (applicable only when <AcT> indicates E-UTRAN).
stat	Indicates the GPRS registration status	Type: integer <ul style="list-style-type: none"> • 7: registered for "SMS only", roaming network (applicable only when <AcT> indicates E-UTRAN). • 8: attached for emergency bearer services only (not applicable). • 9: registered for "CSFB not preferred", local network (applicable only when <AcT> indicates E-UTRAN). • 10: registered for "CSFB not preferred", roaming network (applicable only when <AcT> indicates E-UTRAN).
lac	Tracking area code in hexadecimal format	Type: string
ci	Cell ID in hexadecimal format.	Type: string
AcT	Indicates the access technology type	<ul style="list-style-type: none"> • Type: integer • 0: GSM • 1: GSM Compact • 2: UTRAN • 3(1): GSM w/EGPRS • 4(2): UTRAN w/HSDPA • 5(2): UTRAN w/HSUPA • 6(2): UTRAN w/HSDPA and HSUPA • 7: E-UTRAN • 11 NR connected to a 5G CN

Name	Description	Value
		<ul style="list-style-type: none"> (1): 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. (2): 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
rac	one byte routing area code in hexadecimal format	<ul style="list-style-type: none"> Type: string
cause_type	Indicates the type of <reject_cause>.	Type: integer <ul style="list-style-type: none"> 0: Indicates that <reject_cause> contains an GMM cause value, see 3GPP TS 24.008 [8] Annex G. 1: indicates that <reject_cause> contains a manufacturer-specified cause.
reject_cause	Contains the cause of the failed registration.	Type: integer The value type is defined by <cause_type>.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGREG=0 ①

OK

AT+CGREG? ②

+CGREG: 0,2

OK

AT+CGREG=? ③

+CGREG: (0-3)

OK

① Setting command.

② Read current settings.

③ Query command parameter range

5.5 +CEREG, EPS network registration status

Description

This command controls the presentation of an unsolicited result code +CEREG:<stat> when <n>=1 and there is a change in the MT's EPS network registration status, or code +CEREG:<stat>,<tac>,<ci>,<AcT>]] when <n>=2 and there is a change of the network cell, code +CEREG:<stat>,<tac>,<ci>,<AcT>,<cause_type> [<reject_cause>]]]] when <n>=3.

Format

Type	Command	Response
Setting command	AT+CEREG=[<n>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CEREG?	+CEREG: <n>,<stat>[,<tac>][,<ci>][,<AcT>,<cause_type>,<reject_cause>]]] OK
Query command parameter range	AT+CEREG=?	+CEREG: (list of supported <n>s) OK



FG132 not supported PSM .

CREG, CEREG, CGREG, C5GREG, registered under LTE and NR, will display the same registration information and cell information

Parameter

Name	Description	Value
n	Used to set the return value when reading the command	Type: integer <ul style="list-style-type: none"> • 0: disables network registration unsolicited result code (default value). • 1: enables network registration unsolicited result code +CEREG: <stat>. • 2: enables network registration and location information unsolicited result code +CEREG: <stat>,<tac>,<ci>,<AcT>]]. • 3: enables network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>,<tac>,<ci>,<AcT>,<cause_type>,<reject_cause>

Name	Description	Value
]].
n	Used to set the return value when reading the command	Type: integer <ul style="list-style-type: none"> • 4: For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>[[,<tac>],[<ci>],[<AcT>][,,[<Active-Time>],[<Periodic-TAU>]]]]. • 5: For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[[,<tac>],[<ci>],[<AcT>][,<cause_type>],[<reject_cause>][,<Active-Time>],[<Periodic-TAU>]]]].
stat	Indicates the GPRS registration status	Type: integer <ul style="list-style-type: none"> • 0: not registered, MT is not currently searching an operator to register to. • 1: registered, local network • 2: not registered, MT is currently trying to attach or searching an operator to register to. • 3: registration denied • 4: unknown, for example, out of GERAN/UTRAN/E-UTRAN coverage. • 5: registered, roaming network
stat	Indicates the GPRS registration status	Type: integer <ul style="list-style-type: none"> • 6: registered for "SMS only", local network (applicable only when <AcT> indicates E-UTRAN). • 7: registered for "SMS only", roaming network (applicable only when <AcT> indicates E-UTRAN). • 8: attached for emergency bearer services only (not applicable). For details, see NOTE. • 9: registered for "CSFB not preferred", local network (applicable only when <AcT> indicates E-UTRAN). • 10: registered for "CSFB not preferred", roaming network (applicable only when <AcT> indicates E-UTRAN).
tac	Tracking area code in hexadecimal format	Type: string
ci	cell ID in hexadecimal format	Type: string
AcT	Indicates the access technology	Type: integer <ul style="list-style-type: none"> • 0: GSM • 1: GSM Compact

Name	Description	Value
		<ul style="list-style-type: none"> • 2: UTRAN • 3⁽¹⁾: GSM w/EGPRS • 4⁽²⁾: UTRAN w/HSDPA • 5⁽²⁾: UTRAN w/HSUPA • 6⁽²⁾: UTRAN w/HSDPA and HSUPA • 7: E-UTRAN • 11 NR connected to a 5G CN <p>⁽¹⁾: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.</p> <p>⁽²⁾: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.</p>
cause_type	Indicates the type of <reject_cause>.	Type: integer <ul style="list-style-type: none"> • 0: Indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G. • 1: Indicates that <reject_cause> contains a manufacturer-specified cause.
reject_cause	Contains the cause of the failed registration. The value is of type as defined by <cause_type>.	Type: integer
Active-Time	One byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE	string type
Periodic-TAU	one byte in an 8 bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE	string type

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CEREG=0 ①

OK

AT+CEREG? ②

+CEREG: 0, 1

OK

AT+CEREG=? ③

+CEREG: (0-5)

OK

① Setting command.

② Read current settings.

③ Query command parameter range.

5.6 +C5GREG, 5GS network registration status

Description

The setting command controls the presentation of an unsolicited result code +C5GREG.

Format

Type	Command	Response
Setting command	AT+C5GREG=[<n>]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+C5GREG?	+C5GREG: <n>,<stat>[, [<tac>],[<ci>],[<AcT>],[<Allowed_NSSAI_length>],[<Allowed_NSSAI>],[<cause_type>,<reject_cause>]] OK
Query command parameter range	AT+C5GREG=?	+C5GREG: (list of supported <n>s) OK



CREG, CEREG, CGREG, C5GREG, registered under LTE and NR, will display the same registration information and cell information

Parameter

Name	Description	Value
n	The returned result type or report method of the C5GREG parameter.	Type: integer 0: disable network registration unsolicited result code (default value) 1: enable network registration status unsolicited result code report +C5GREG: <stat> 2: network registration and location information report, +C5GREG: <stat>[, [<tac>], [<ci>], [<AcT>][<Allowed_NSSAI_length>][<Allowed_NSSAI>]] 3: network registration, location information and 5GMM cause value information, +C5GREG: <stat>[, [<tac>], [<ci>], [<AcT>][<Allowed_NSSAI_length>][<Allowed_NSSAI>]][, <cause_type>, <reject_cause>]];
stat	Registration status	Type: integer 0: not registered, MT is not currently searching an operator to register to 1: registered, local network 2: not registered, MT is currently trying to attach or searching an operator to register to 3: registration denied 4: unknown, for example, out of NR coverage 5: registered, roaming network 6: registered for SMS only local network (not applicable) 7: registered for SMS only roaming network (not applicable) 8: attached for emergency bearer services only 9: registered for CSFB not preferred local network (not applicable) 10: registered for CSFB not preferred roaming network (not applicable) 11: registered for RLOS (not applicable)
tac	Location area code of three bytes, displayed in hexadecimal format (for example, "0000C3" equals decimal 195).	Type: string
ci	Five-byte NR cell ID in hexadecimal format.	Type: string
Allowed_NSSAI_length	Indicates the number of octets of the <Allowed_NSSAI> information element.	Type: integer

Name	Description	Value
Allowed_NSSAI	Depending on the format, strings can be separated by dots, semicolons, and colons. This parameter indicates the allowed S-NSSAIs list received from the network. <Allowed_NSSAI> is encoded as a column of <s - nssai> separated by colons. For details about <S-NSSAI>, refer to section 10.1.1. This parameter should not be converted to regular characters by +CSCS.	Type: hexadecimal string
AcT	Indicates the access technology type	Type: integer 0: GSM (not applicable) 1: GSM Compact (not applicable) 2: UTRAN (not applicable) 3: GSM w/EGPRS (not applicable) 4: UTRAN w/HSDPA (not applicable) 5: UTRAN w/HSUPA (not applicable) 6: UTRAN w/HSDPA and HSUPA (not applicable) 7: E-UTRAN 8: EC-GSM-IoT (A/Gb mode) (not applicable) 9: E-UTRAN (NB-S1 mode) (not applicable) 10: E-UTRA connected to a 5GCN (not applicable) 11: NR connected to a 5GCN 12: NG-RAN 13: E-UTRA-NR (not applicable)
cause_type	Indicates the type of <reject_cause>.	Type: integer 0: indicates that <reject_cause> contains an MM cause value, see 3GPP TS 24.008 [8] Annex G. 1: indicates that <reject_cause> contains a manufacturer-specified cause value.
reject_cause	Contains the cause of the failed registration. The value type is defined by <cause_type>.	Type: integer

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example**AT+C5GREG?** ①

+C5GREG: 0,0

OK

AT+C5GREG=? ②

+C5GREG: (0-3)

OK

① Read current settings.

② Query command parameter range.

5.7 +COPS, select operators

Description

This command provides access to network registration information, as well as selection and registration of GSM/UMTS network operator. The module is registered in the local network. The Enhanced Operator Name String (EONS) feature enables the module to return the operator name displayed on the handset.

This feature allows the SIM card to store a mapping of MCC/MNC code pairs to the displayed operator name. As a result, several operators can share a single network while having their handsets display their own name as the network operator. Testing the enhanced ONS feature requires a "SIM ONS" SIM card.

Format

Type	Command	Response
Setting command	AT+COPS=[<mode>[,<format>[,<oper>[,<AcT>]]]]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+COPS?	Response 1: +COPS: <mode>[,<format>,<oper>[,<AcT>]]
		OK Response 2: ERROR
Query command	AT+COPS=?	+COPS: [list of supported

Type	Command	Response
		(<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,,(list of supported <mode>s),(list of supported <format>s)]
		OK

Parameter

Name	Description	Value
mode	Set command parameters and the mode of registering the network.	Type: integer <ul style="list-style-type: none"> • 0: automatic (<oper> field is ignored); default value • 1: manual (<oper> field shall be displayed, and <AcT> optionally) • 2: deregister from network • 3: set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> and <AcT> fields are ignored); this value is not applicable in read command response.
mode	Set command parameters and the mode of registering the network.	Type: integer <ul style="list-style-type: none"> • 4: manual/automatic (<oper> field shall be displayed); if manual selection fails, automatic mode (<mode>=0) is entered.
format	--	Type: integer <ul style="list-style-type: none"> • 0: long format alphanumeric <oper>; default value (for example, the full name of China Unicom is "CHINA UNICOM") • 1: short format alphanumeric <oper> (for example, China Mobile is abbreviated as "CMCC") • 2: numeric <oper>
oper	<format> indicates whether the format is alphabetic or numeric. The long alphabetic format can be up to 16 characters and the short alphabetic format can be up to 8 characters (see GSM MoU SE.13 [9]). The numeric format is the GSM location area identification number (see sub-clause 10.5.1.3 in 3GPP TS 24.008), which consists of three BCD bit mobile	Type: string

Name	Description	Value
	country codes and two BCD bit mobile network codes. Which are management specific. The returned <oper> should not be in BCD format, but should be an IRA character converted from BCD; therefore, the number has the following structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network code digit 2)(network code digit 1).	
stat	Is the currently discovered network available	Type: integer <ul style="list-style-type: none"> • 0: unknown • 1: available • 2: current • 3: forbidden
AcT	Access technology selection	Type: integer <ul style="list-style-type: none"> • 0: GSM • 1: GSM Compact • 2: UTRAN • 3⁽¹⁾: GSM w/EGPRS • 4⁽²⁾: UTRAN w/HSDPA • 5⁽²⁾: UTRAN w/HSUPA • 6⁽²⁾: UTRAN w/HSDPA and HSUPA • 7: E-UTRAN • 11: NR connected to a 5GCN • 12: NG-RAN • 13: E-UTRA-NR dual connectivity <p>⁽¹⁾: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.</p> <p>⁽²⁾: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.</p>

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take	No	Require Data Store at Power Down	No

Effect

Max Response Duration (ms)	180000	Max Result Returning Duration (ms)	180000
----------------------------	--------	------------------------------------	--------

Example

```

AT+COPS=0 1
OK
AT+COPS? 2
+COPS: 0,0,"CHINA MOBILE",11
OK
AT+COPS=? 3
+COPS:
(1,"CHN-UNICOM","UNICOM","46001",12),(3,"CHN-TELECOM","TELECOM","46011",12),(1,"Voda
fone.de","Vodafone","26202",12),(1,"Vodafone ES","Voda ES","21401",12),,(0-4),(0-2)
OK

```

- 1 Setting command.
- 2 Read current settings.
- 3 Query command parameter range.

5.8 +CPLS, select preferred PLMN list

Description

This command is used to select one PLMN selector with Access Technology list in the SIM card or active application in the UICC (GSM or USIM), that is used by +CPOL command.

Format

Type	Command	Response
Setting command	AT+CPLS=[<list>]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CPLS?	+CPLS: <list>
		OK
Query command	AT+CPLS=?	+CPLS: (list of supported <list>s)
		OK

Parameter

Name	Description	Value
list	PLMN selector with Access Technology list	Type: integer <ul style="list-style-type: none"> • 0: User controlled PLMN selector with Access Technology EFPLMNwAcT, if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC). • 1: Operator controlled PLMN selector with Access Technology EFOPLMNwAcT. • 2: HPLMN selector with Access Technology EFHPLMNwAcT.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CPLS=0 ①

OK

AT+CPLS? ②

+CPLS: 0

OK

AT+CPLS=? ③

+CPLS: (0-2)

OK

① Setting command.

② Read current settings.

③ Query command parameter range.

5.9 +GTRAT, select Radio Access Technology

Description

This command is used to manually select RAT (Radio Access Technology) to register network. After you input this command, the executed result will be returned immediately then the device attempts to

register the specified RAT. In case of GSM/UMTS, GSM/LTE or UMTS/LTE dual-mode is selected, a preferred RAT can be configured additionally, which is stored in NVRAM selecting which RAT shall be attached first.

In case of GSM/UMTS/LTE triple-mode is selected, a first preferred RAT and a second preferred RAT can be configured to set the searching order of available RATs.

In case of TDS/WCDMA dual-mode is selected, the preferred URAT can be configured, which is stored in NARAM selecting which URAT shall be attached first.

The setting command is used to set RAT value used for further network registration (at+cops=0). Read command returns the previously values of <Act> and <PreferredAct>.

Test command returns the range of supported <Act> and <PreferredAct> values.



If there is a modem configuration update or operator switch, such as software upgrades, and the new version modifies the relevant configuration of the modem, or replaces the SIM card with a different operator, etc , the FG132 platform will modify the RAT to recommended by the platform for this operator

Format

Type	Command	Response
Setting command	AT+GTRAT=<Act> [,<PreferredAct1>[, <PreferredAct2>]]	Response 1: OK Response 2: ERROR
Read current settings	AT+GTRAT?	+GTRAT : <Act>[,<PreferredAct1>[,<PreferredAct2>]] OK
Query command parameter range	AT+GTRAT=?	+GTRAT: (list of supported<Act>s),(list of supported<PreferredAct1>s),(list of supported<PreferredAct2>s) OK

Parameter

Name	Description	Value
Act	Access technology type	Type: integer <ul style="list-style-type: none"> • 3: LTE • 10: automatic • 14 NR-RAN • 17 NR-RAN/LTE • default value is 10
PreferredAct1	Selected parameter must be a part of <Act>.	Type: integer <ul style="list-style-type: none"> • 3: LTE is preferred

Name	Description	Value
		<ul style="list-style-type: none"> • 6: NR-RAN is preferred
PreferredAct2	Selected parameter must be a part of <Act>.	Type: integer <ul style="list-style-type: none"> • 3: LTE is preferred • 6: NR-RAN is preferred

Characteristic			
Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTRAT=17,6,3 1

OK

AT+GTRAT? 2

+GTRAT:17,6,3

OK

1 Setting command

2 Read current settings

5.10 +GTACT, select RAT and BAND

Description

This command allows to switch between all the allowed RATs and BANDs for air interface access. After you input this set command, the executed result will be returned immediately then the device attempts to register the specified RAT and bands.



This command gives a flexibility to configure either RAT/preferred RAT/BAND. Therefore, the user can only configure RAT or BAND.

LTE parameters should be used only for the LTE platforms. In other cases, the behavior is not defined.

Band changes for a specific RAT does not affect the configuration of other RATs.

For details about supported bands, refer to the hardware manual.

Ex: Setting LTE bands will not change anything on NR bands.

AT+GTACT=17,,,120 => LTE B20 & NR full band

If there is a modem configuration update or operator switch, such as software upgrades, and the new version modifies the relevant configuration of the modem, or

replaces the SIM card with a different operator, etc , the FG132 platform will modify the band according to the specific situation of the operator, which will change the band list queried by AT+GTACT?. It is recommended to reset according to specific needs after changing SIM cards from different operators.

Format

Type	Command	Response
Setting command	AT+GTACT=[<rat>],[<PreferredAct1>],[<PreferredAct2>] [,<band_1>,<band_2>[,..... .,<band_n>]]]]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+GTACT?	+GTACT:[<rat>],[<PreferredAct1>],[<PreferredAct2>] [,<band_1>,<band_2>[,..... [,<band_n>]]]]]]] OK
Query command parameter range	AT+GTACT=?	+GTACT: (list of supported <rat>s),(list of supported <PreferredAct1>s),(list of supported <PreferredAct2>s),(list of supported <lte_band>s),(list of supported <nr_band>s) OK

Parameter

Name	Description	Value
rat	Access technology type	Type: integer <ul style="list-style-type: none"> • 2: LTE • 10: automatic • 14: NR-RAN • 17: NR-RAN/LTE • default value is 10
PreferredAct1	Selected parameter must be a part of <Act>.	Type: integer <ul style="list-style-type: none"> • 3: LTE is preferred • 6: NR-RAN is preferred
PreferredAct2	Selected parameter must be a part of <Act>.	Type: integer <ul style="list-style-type: none"> • 3: LTE is preferred • 6: NR-RAN is preferred
Band_1,	- -	Type: integer

Name	Description	Value
Band_2, ..., Band_n		<ul style="list-style-type: none"> • 0: automatic band selection for the <rat> as described in the command. If no value is specified for <rat>, automatic band selection is set for all the RATs.
lte_band	--	Type: integer <ul style="list-style-type: none"> • 101: BAND_LTE_1 • 102: BAND_LTE_2 • 103: BAND_LTE_3 • 104: BAND_LTE_4 • 105: BAND_LTE_5 • 106: BAND_LTE_6 • 107: BAND_LTE_7 • 108: BAND_LTE_8 • 109: BAND_LTE_9 • 110: BAND_LTE_10 • 111: BAND_LTE_11 • 112: BAND_LTE_12 • 113: BAND_LTE_13 • 114: BAND_LTE_14 • 115: BAND_LTE_15 • 116: BAND_LTE_16 • 117: BAND_LTE_17 • 118: BAND_LTE_18 • 119: BAND_LTE_19 • 120: BAND_LTE_20
lte_band	--	Type: integer <ul style="list-style-type: none"> • 121: BAND_LTE_21 • 122: BAND_LTE_22 • 123: BAND_LTE_23 • 124: BAND_LTE_24 • 125: BAND_LTE_25 • 126: BAND_LTE_26 • 127: BAND_LTE_27 • 128: BAND_LTE_28 • 129: BAND_LTE_29 • 130: BAND_LTE_30 • 131: BAND_LTE_31

Name	Description	Value
		<ul style="list-style-type: none"> • 132: BAND_LTE_32 • 133: BAND_LTE_33 • 134: BAND_LTE_34 • 135: BAND_LTE_35 • 136: BAND_LTE_36 • 137: BAND_LTE_37
lte_band	- -	Type: integer <ul style="list-style-type: none"> • 138: BAND_LTE_38 • 139: BAND_LTE_39 • 140: BAND_LTE_40 • 141: BAND_LTE_41 • 142: BAND_LTE_42 • 143: BAND_LTE_43 • 144: BAND_LTE_44 • 145: BAND_LTE_45 • 146: BAND_LTE_46 • 147: BAND_LTE_47 • 148: BAND_LTE_48 • 149: BAND_LTE_49 • 150: BAND_LTE_50 • 151: BAND_LTE_51 • 152: BAND_LTE_52 • 153: BAND_LTE_53 • 154: BAND_LTE_54 • 155: BAND_LTE_55 • 156: BAND_LTE_56 • 157: BAND_LTE_57
lte_band	- -	Type: integer <ul style="list-style-type: none"> • 158: BAND_LTE_58 • 159: BAND_LTE_59 • 160: BAND_LTE_60 • 161: BAND_LTE_61 • 162: BAND_LTE_62 • 163: BAND_LTE_63 • 164: BAND_LTE_64 • • 170: BAND_LTE_70

Name	Description	Value
nr_band		• 171: BAND_LTE_71
		• 501 BAND_NR_1
		• 502 BAND_NR_2
		• ...
		• 509 BAND_NR_9
		• 5010 BAND_NR_10
		• ...
		• 50512 BAND_NR_512
		• ...

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTACT=2,,,108 **①**

OK

AT+GTACT? **②**

+GTACT: 2,,,108

OK

① Setting command

② Read current settings

5.11 +GTCCINFO, get cell current information

Description

This command acquires the current information of cell.

Format

Type	Command	Response
Read current settings	AT+GTCCINFO?	+GTCCINFO: LTE (a maximum of ten LTE cells are supported) LTE service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cell_id >,<earfcn>,<physical_cellId >,<band>,<bandwidth>,<rssnr_value>,<rxlev>,<rsrp>,<rsrq> LTE neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cell_id >,<earfcn>,<physical_cellId >,<bandwidth>,<rxlev>,<rsrp>,<rsrq> OK
Read current settings	AT+GTCCINFO?	+GTCCINFO: NR Cell (a maximum of ten NR cells are supported) NR service cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cell_id >,<narfcn>,<physical_cellId >,<band>,<bandwidth>,<ss_snr>,<rxlev>,<ss_rsrp>,<ss_rsrq> NR neighbor cell: <IsServiceCell>,<rat>,<mcc>,<mnc>,<tac>,<cell_id >,<narfcn>,<physical_cellId >,<ss_snr>,<rxlev>,<ss_rsrp>,<ss_rsrq> OK

Parameter

Name	Description	Value
IsServiceCell	Determine whether a service cell exists or not	Type: integer • 1: service cell • 2: no service cell
rat	Access technology	Type: integer • 0: Invalid network • 4: LTE • 9: NR-RAN
cell_id	No current cell ID	Type: integer Range : 0-0xFFFFFFFF (36bit) for SA and 0-0xFFFFFFFF (28 bit) for LTE
mcc	Country code	Type: integer

Name	Description	Value
mnc	Operator network code	Type: integer
band	when register to LTE:	Type: integer BAND_LTE_1 - BAND_LTE_71
	when register to NR:	Type: integer BAND_NR_1 - BAND_NR_79
rxlev	The range of that network signal when register to LTE	Type: integer Range: 0 to 255 <ul style="list-style-type: none"> • 0: RSRP < -140dbm • 1: -140dbm ≤ RSRP < -139dbm • ... • 96: -45dbm ≤ RSRP < -44dbm • 97: -44dbm ≤ RSRP • 255 Invalid value
rxlev	The range of that network signal when register to NR	Type: integer Range: 0 to 255 0: SS-RSRP < -156 dBm <ul style="list-style-type: none"> • 1: -156 dB ≤ SS-RSRP < -155 dBm • 2: -155 dB ≤ SS-RSRP < -154 dBm • ... • 125: -32 dBm ≤ SS-RSRP < -31 dBm • 126: -31 dBm ≤ SS-RSRP • 255: Invalid value
tac	Tracking area code when register to LTE	Type: integer Range: 0 to 0xFFFF
tac	Tracking area code when register to NR	Type: integer Range: 0 to 0xFFFFF
earfcn	EUTRA absolute RF channel number	Type: integer Range: 0 to 0xFFFFFFFF
physical_cellId	Physical cell ID when register to LTE	Type: integer Range: 0 to 0xFFFFFFFF
physical_cellId	Physical cell ID when register to NR	Type: integer Range: 0 to 0xFFFFFFFF
rssnr_value	Radio signal strength noise ratio	Type: integer Range: -100 to 100 <ul style="list-style-type: none"> • -100: RSSNR ≤ -50 dB; • -99: -50 dB < RSSNR ≤ -49.5 dB; • -98: 49.5 dB < RSSNR ≤ -49 dB;

Name	Description	Value
		<ul style="list-style-type: none"> • ... • -1: $-1 \text{ dB} < \text{RSSNR} \leq -0.5 \text{ dB}$; • 0: $-0.5 \text{ dB} < \text{RSSNR} \leq 0 \text{ dB}$; • 1: $0 \text{ dB} < \text{SSNR} \leq 0.5 \text{ dB}$; • 98: $49 \text{ dB} < \text{RSSNR} \leq 49.5 \text{ dB}$; • 99: $49.5 \text{ dB} < \text{RSSNR} \leq 50 \text{ dB}$; • 100: $50 \text{ dB} < \text{RSSNR}$; •
rsrp	Signal receive power	Type: integer Range: 0 to 255 0 indicates that less than -140 dBm or undetectable.
rsrq	Signal receive quality	Type: integer Range: 0 to 255 <ul style="list-style-type: none"> • 0: $\text{RSRQ} < -19.5 \text{ dB}$ • 1: $-19.5 \text{ dB} \leq \text{RSRQ} < -19.0 \text{ dB}$ • ... • 33: $-3.5 \text{ dB} \leq \text{RSRQ} < -3.0 \text{ dB}$ • 34: $-3.0 \text{ dB} \leq \text{RSRQ}$ • 255 Invalid value. not known or not detectable
narfcn	NR5G Radio Frequency Channel Number	Type: integer Range: 0 to 0xFFFFFFFF
bandwidth	For LTE, it is used RB number to indicate bandwidth For NR, it cannot indicate bandwidth using RB number due to different SCS, integer type and range is 0-400.	LTE: Integer type and range is 0-100 6: 1.4 MHz 15: 3 MHz 25: 5 MHz 50: 10 MHz 75: 15 MHz 100: 20 MHz NR : integer type and range is 0-400. 0: 5MHz

Name	Description	Value
		10: 10MHz
		15: 15MHz
		20: 20MHz
		25: 25MHz
		30: 30MHz
		40: 40MHz
		50: 50MHz
		60: 60MHz
		80: 80MHz
		90: 90MHz
		100: 100MHz
		200: 200MHz
		400: 400MHz
ss_rsrq	integer type, synchronization signal-based reference signal received quality (see 3GPP TS 38.133 [169] subclause 10.1.11)	<ul style="list-style-type: none"> • 0: ss_rsrq < -43 dB • 1: $-43 \text{ dB} \leq \text{ss_rsrq} < -42.5 \text{ dB}$ • 2: $-42.5 \text{ dB} \leq \text{ss_rsrq} < -42 \text{ dB}$ • ... • 124: $18.5 \text{ dB} \leq \text{ss_rsrq} < 19 \text{ dB}$ • 125: $19 \text{ dB} \leq \text{ss_rsrq} < 19.5 \text{ dB}$ • 126: $19.5 \text{ dB} \leq \text{ss_rsrq} < 20 \text{ dB}$ 255 not known or not detectable
ss_rsrp	integer type, synchronization signal based reference signal received power (see 3GPP TS 38.133 [169] subclause 10.1.6)	<ul style="list-style-type: none"> • 0: ss_rsrp < -156 dBm • 1: $-156 \text{ dBm} \leq \text{ss_rsrp} < -155 \text{ dBm}$ • 2: $-155 \text{ dBm} \leq \text{ss_rsrp} < -154 \text{ dBm}$ • ... • 125: $-32 \text{ dBm} \leq \text{ss_rsrp} < -31 \text{ dBm}$ • 126: $-31 \text{ dBm} \leq \text{ss_rsrp}$ 255 Not known or not detectable
ss_sinr	integer type, synchronization signal based signal to noise and interference ratio (see 3GPP TS 38.133 [169] clause 10.1.16).	<ul style="list-style-type: none"> • 0: ss_sinr < -23 dB • 1: $-23 \text{ dB} \leq \text{ss_sinr} < -22.5 \text{ dB}$ • 2: $-22.5 \text{ dB} \leq \text{ss_sinr} < -22 \text{ dB}$ • ... • 125: $39 \text{ dB} \leq \text{ss_sinr} < 39.5 \text{ dBm}$ • 126: $39.5 \text{ dB} \leq \text{ss_sinr} < 40 \text{ dB}$ • 127: $40 \text{ dB} \leq \text{ss_sinr}$

Name	Description	Value
		255 Not known or not detectable
Characteristic		
Require SIM Card Normal	No	Require Network Registration No
Require Data Connection	No	Async or Sync Command Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down No
Max Response Duration (ms)	15000	Max Result Returning Duration (ms) 15000

Example

```

AT+GTCCINFO? 
1
+GTCCINFO:
LTE service cell:
1,4,460,01,25F1,BCE5F03,672,1F4,103,100,0,64,64,17

LTE neighbor cell:
2,4,460,01,0,0,672,1F4,0,64,64,17
2,4,460,01,0,0,672,7A,0,51,51,3

OK


```

1 Setting command

5.12 +COPN, read operator names

Description

This command is used to read operator names.

Format

Type	Command	Response
Setting command	AT+COPN	Response 1: +COPN: <numeric1>,<alpha1>[<CR><LF>+COPN: <numeric2>,<alpha2> [...]] OK Response 2: ERROR
Query command parameter range	AT+COPN=?	OK

Parameter

Name	Description	Value
numericn	Operators in numeric format (see +COPS)	Type: string
alphan	Operators in long alphanumeric format (see +COPS)	Type: string If no matching PLMN name is found, the numeric PLMN ID (MCCMNC) is displayed.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+COPN 1
+COPN: "40410", "Bharti Cellular"
+COPN: "40420", "Hutchison Max"
+COPN: "40430", "Usha Martin"
+COPN: "40411", "Hutchison Essar"
+COPN: "45400", "Hong Kong CSL"

.....

OK

```

1 Read current settings.

5.13 +CEMODE, UE modes of operation for EPS

Description

This command is used to set the MT to operate according to the specified mode of operation for EPS.

Format

Type	Command	Response
Setting command	AT+CEMODE=[<mode>]	Response 1: OK Response 2: ERROR

Type	Command	Response
Read current settings	AT+CEMODE?	+CEMODE: <mode> OK
Query command parameter range	AT+CEMODE=?	+CEMODE: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	Indicates the operation mode, the default value depends on the target product.	Type: integer <ul style="list-style-type: none"> • 0: PS mode 2 • 1: CS/PS operation mode 1 • 2: CS/PS operation mode 2 • 3: PS mode 1 The definition of the UE operation mode can be found in 3GPP TS 24.301 [83].

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CEMODE=0 ①

OK

AT+CEMODE? ②

+CEMODE: 0

OK

AT+CEMODE=? ③

+CEMODE: (0-3)

OK

- ① Setting command.
- ② Read current settings.
- ③ Query command parameter range.

5.14 +GTCELLLOCK, information configuration of cell lock

Description

This command is used to force the UE to register for a specific cell (fixed cell and frequency).



Locked NR cells cannot be used in NR only mode.

If the frequency of the NR to be locked exists in multiple bands, the bands cannot be defaulted.

Format

Type	Command	Response
Setting command	AT+GTCELLLOCK=<mode>[,<rat>,<type>,<earfcn/narfcn>[,<PCI>][,<scs>][,<nrband>]]	Response 1: OK Response 2: ERROR
Read current settings	AT+ GTCELLLOCK?	+GTCELLLOCK:<mode>[,<rat>,<type>,<earfcn/narfcn>[,<PCI>][,<scs>][,<nrband>]] OK
Query command parameter range	AT+ GTCELLLOCK=?	+GTCELLLOCK: (list supported <mode>s),(list of supported <rat>s),(list of supported <type>s),(list of supported <earfcn/narfcn>s),(list of supported <PCI>s),(list of supported <scs>s),(list of supported <nrband>s) OK

Parameter

Name	Description	Value
mode	Function switch	Type: integer 0: disable the function 1: enable the function default value is 0
rat	System	Type: integer 0: LTE 1: NR

Name	Description	Value
type	Lock type	Type: integer 0: lock PCI 1: lock frequency point
earfcn/narfcn	Frequency point earfcn--LTE narfcn--NR	Type: integer Range: 0 to 4294967295
PCI	Physical cell ID	Type: integer When RAT=0, 0-503 corresponds to LTE When RAT=1, 0-1007 corresponds to NR
scs	Sub-carrier space	Type: integer 0: 15 KHz 1: 30 KHz
nrband	NR band	Type: integer 501 BAND_NR_1 502 BAND_NR_2 ... 509 BAND_NR_9 5010 BAND_NR_10 ... 5079 BAND_NR_79

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GTCELLLOCK= 1,1,1,504990,,1 ①
OK

AT+GTCELLLOCK? ②
+GTCELLLOCK: 1,1,1,504990,,1

OK

AT+GTCELLLOCK=? ③
+GTCELLLOCK: (0,1),(0,1),(0,1),(0-4294967295),(0-1007),(0-1),(501-5079)

```

OK

AT+GTCCELLLOCK=0

4

OK

- ① Set cell lock.
- ② Read current settings.
- ③ Query command parameter range.
- ④ Close cell lock.

5.15 +GTROAMCFG, roaming dial control

Description

This command is used to control ECM/RMNET dialing in roaming status.

Format

Type	Command	Response
Setting command	AT+GTROAMCFG=<n>	Response 1: OK Response 2: ERROR
Read current settings	AT+GTROAMCFG?	+GTROAMCFG: <n>,< roaming_status> OK
Query command parameter range	AT+GTROAMCFG=?	+GTROAMCFG: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Function switch: if the value of n is 0, the UE can not dial in roaming status; if the value of n is 1, the UE can dial in roaming status.	Type: integer 0: disable the function 1: enable the function (default value)
roaming_status	The UE is registered to HPLMN/EHPMN (non-roam) or non-HPLMN (roam).	Type: integer 0: non-roam 1: roam

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTROAMCFG? ❶

+GTROAMCFG: 1,0

OK

AT+GTROAMCFG=? ❷

+GTROAMCFG: (0,1)

OK

AT+GTROAMCFG=0 ❸

OK

❶ Read current settings.

❷ Query command parameter range.

❸ Set the function to turn off roaming dialing.

5.16 +GTCELLSCAN, scan frequency and obtain the neighbor cell information

Description

This command is used to scan frequency and obtain the neighbor cell information.

.

Format

Type	Command	Response
Setting command	AT+GTCELLSCAN[=<rat>]	<p>Response 1:</p> <p>When <rat>=0,</p> <p>+GTCELLSCAN:</p> <p>4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF></p> <p>+GTCELLSCAN:</p> <p>4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF></p> <p>.....</p> <p>+GTCELLSCAN:</p> <p>5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><</p>

Type	Command	Response
		CR><LF> +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss _rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal>< CR><LF> OK When <rat>=4, +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rs rp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR>< LF> +GTCELLSCAN: 4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rs rp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR>< LF> OK When <rat>=5, +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss _rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal>< CR><LF> +GTCELLSCAN: 5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss _rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal>< CR><LF> • OK Response 2: ERROR

Type	Command	Response
Execution command	AT+GTCELLSCAN	<p>Response 1:</p> <p>+GTCELLSCAN:</p> <p>4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF></p> <p>+GTCELLSCAN:</p> <p>4,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<rsrp>,<rsrq>,<band_LTE>,<srxlev>,<squal><CR><LF></p> <p>.....</p> <p>+GTCELLSCAN:</p> <p>5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR><LF></p> <p>+GTCELLSCAN:</p> <p>5,<mcc>,<mnc>,<freq>,<pci>,<tac>,<cellid>,<ss_rsrp>,<ss_rsrq>,<band_NR>,<srxlev>,<squal><CR><LF></p> <p>.....</p> <p>OK</p> <p>Response 2:</p> <p>ERROR</p>

Parameter

Name	Description	Value
rat	Network mode	Type: integer <ul style="list-style-type: none"> • 4: 4G network • 5: 5G network • 0: Default value, all networks supported by the product are searched by default.
mcc	Mobile country code	Type: integer Value range: 000 to 999 Must be a 3-digit decimal number
mnc	Mobile network code	Type: integer Value range: 00 to 999 Must be a 2-digit or 3-digit decimal number
freq	Uarfcn or Earfcn or Narfcn	Type: integer Value range: 0 to 4294967295
pci	Physical cell ID	Type: integer Value range: 0 to 503 or 0 to 1007 0 to 503 is PCI range of LTE, and 0 to 1007 is PCI

Name	Description	Value
		range of NR.
tac	Tracking area code	Type: integer Value range: 0 to 65535 or 0 to 16777215 0 to 65535 is tac range of LTE, and 0 to 16777215 is tac range of NR.
cellid	Cell ID	Type: integer Value range: 0 to 268435455 or 0 to 68719476735 0 to 268435455 is cell ID range of LTE, and 0 to 68719476735 is cell ID range of NR.
rsrp	Reference signal receive power (LTE)	Type: integer Value range: -140 to -44 Unit: dBm
rsrq	Reference signal receive quality (LTE)	Type: integer Value range: -19.5 to -3 Unit: dBm
ss_rsrq	Reference signal receive quality (SA)	Type: integer Value range: -43 to 20 Unit: dB
ss_rsrp	Reference signal receive power (SA)	Type: integer Value range: -156 to -31 Unit: dBm
band_LTE	LTE band information	Type: integer Value range: 1 to 71
band_NR	NR band information	Type: integer Value range: 1 to 1024
srxlev	rx level value of cell selection	Type: integer Value range: -256 to 256 Unit: dBm
squal	Quality of cell selection	Type: integer Value range: -256 to 256 Unit: dBm

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Async command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	180000	Max Result Returning Duration (ms)	180000

Example

AT+GTCCELLSCAN

①

```
+GTCCELLSCAN: 4,460,01,1650,500,37132,198074115,-82,-12,8,16,111
+GTCCELLSCAN: 4,460,00,38950,197,37107,125995521,-82,-7,51,20,116
+GTCCELLSCAN: 4,460,01,3741,502,37132,199111505,-100,-16,3,40,120
+GTCCELLSCAN: 4,460,11,500,279,9567,8533894,-138,-22,1,43,121
```

```
+GTCCELLSCAN: 4,460,01,1500,67,37132,199111446,-99,-8,20,23,112
+GTCCELLSCAN: 5,460,11,627264,443,12345361,50570199042,-106,-12,1,19,115
+GTCCELLSCAN: 5,460,11,627264,566,12345361,50570211330,-109,-12,78,32,112
+GTCCELLSCAN: 5,460,11,627264,564,12345361,50570211328,-113,-16,78,26,6
```

OK

AT+GTCCELLSCAN=4

②

```
+GTCCELLSCAN: 4,460,01,1650,500,37132,198074115,-82,-12,8,16,111
+GTCCELLSCAN: 4,460,00,38950,197,37107,125995521,-82,-7,51,20,116
+GTCCELLSCAN: 4,460,01,3741,502,37132,199111505,-100,-16,3,40,120
+GTCCELLSCAN: 4,460,11,500,279,9567,8533894,-138,-22,1,43,121
+GTCCELLSCAN: 4,460,01,1500,67,37132,199111446,-99,-8,20,23,112
```

OK

AT+GTCCELLSCAN=5

③

```
+GTCCELLSCAN: 5,460,11,627264,443,12345361,50570199042,-106,-12,1,19,115
+GTCCELLSCAN: 5,460,11,627264,566,12345361,50570211330,-109,-12,78,32,112
+GTCCELLSCAN: 5,460,11,627264,564,12345361,50570211328,-113,-16,78,26,6
```

OK

- ① Search for information of cells under all networks in the current environment.
- ② Search for 4G cell information.
- ③ Search for 5G cell information.

5.17 +GTRRCREL, Local quick release RRC connection function

Description

This command is used to release the RRC connection locally. After the last packet of data is sent, if no data or signaling is sent within the specified time, the local release of the RRC connection is directly used in low power consumption, so that the terminal can quickly enter the low power consumption after completing services. This command can also be used to configure the RRC fast release. You can configure whether to enable the control interface based on the RRC connect request frequency, and determine whether the quick release can be performed according to the configured RRC connect request frequency.

Format

Type	Command	Response
Setting command	AT+GTRRCREL=[<value>[,<rrc_connect_mode>[,<rrc_connect_frequency>]]]	Response: OK or: ERROR
Read current	AT+GTRRCREL?	Response: +GTRRCREL:

settings		<value>[,<rrc_connect_mode>[,<rrc_connect_frequency>]] OK or: ERROR
Query command parameter range	AT+GTRRCREL=?	Response: +GTRRCREL: (list of supported <value>s), (list of supported < rrc_connect_mode >s), (list of supported < rrc_connect_frequency >s) OK



RRC connection will be released immediately after execution AT+ GTRRCREL
 It only takes effect in lte mode

Parameter

Name	Description	Value
value	<p>Set the local quick release RRC connection function. The default value is 0. Disable the quick release RRC connection function</p> <p>Note: The FG132 platform currently does not support setting the release timer value. If you need to release the RRC connection, you can use AT+GTRRCREL to take immediate effect</p>	<p>Value range: 10 - 20 Unit: 1s</p> <p>0: Disable the local quick release of RRC connections. The network releases RRC connections in accordance with 3GPP specifications.</p> <p>10-20: Set the local quick release time to T*1 seconds. If no data or signaling is sent, the local RRC connection is released after T*1 seconds.</p> <p>Note: After setting the corresponding time, the local quick release time is different from the configured time. The reasons are as follows:</p> <ol style="list-style-type: none"> 1. The timer is a software timer. 2. If signaling is transmitted on the network, for example, when a measurement report is sent or RRC connection reconfiguration is received, the time for releasing the local RRC connection will be slightly longer.
rrc_connect_mode	Configures whether to enable local RRC connection release based on RRC connect	<p>Value range: 0 - 1</p> <p>0: Disables control based on RRC connect request frequency</p>

Name	Description	Value
	request frequency. The default value is 0. Disables local RRC connection release based on RRC connect request frequency	1: Enable RRC connect request frequency based control function, need to set <code>rrc_connect_frequency</code>
<code>rrc_connect_frequency</code>	The default value is 10, that is, the average interval of four RRC connect requests is 10s	Value range: 1 - 30 Unit: s 10: Average interval of four RRC connect requests: When the total interval of four RRC connect requests is less than 30 seconds, the next RRC quick release is not executed. Note: This value is configured only when <code>rrc_connect_mode</code> is set to 1;

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GTRRCREL? ❶
+GTRRCREL: 0

OK

AT+GTRRCREL=10 ❷

OK

AT+GTRRCREL=? ❸
+GTRRCREL: (0,10-20),(0,1),(1-30)

OK

```

❶ If the current setting is queried, 0 indicates that the local RRC connection release function is disabled.

- ② Set the local release RRC connection when no data or signaling is transmitted on 10s
- ③ Example Query the supported parameters.

5.18 +CEDRXS, eDRX setting

Description

The set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.

The set command also controls the presentation of an unsolicited result code +CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] when <n>=2 and there is a change in the eDRX parameters provided by the network.

A special form of the command can be given as +CEDRXS=3. In this form, eDRX will be disabled and data for all parameters in the command +CEDRXS will be removed or, if available, set to the manufacturer specific default values.

Refer clause 9.2 for possible <err> values.

The read command returns the current settings for each defined value of <AcT-type>. The access technology type parameter <AcT-type>, should not be used in terminals capable of only one access technology.

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

Format

Type	Command	Response
Setting command	AT+CEDRXS=[<mode>[,<AcT-type>[,<Requested_eDRX_value>]]]	Response: OK or: ERROR
Read current settings	AT+CEDRXS?	Response: [+CEDRXS: <AcT-type>,<Requested_eDRX_value> [<CR><LF>+CEDRXS: <AcT-type>,<Requested_eDRX_value> [...]]] OK or: ERROR
Query command parameter	AT+CEDRXS=?	Response: +CEDRXS: (list of supported <mode>s),(list of supported <AcT-type>s),(list of supported

range <Requested_eDRX_value>s)

OK

Parameter

Name	Description	Value
mode	integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>	Value range: 0 - 3 0: Disable the use of eDRX (default value) 1: Enable the use of eDRX 2: Enable the use of eDRX and enable the unsolicited result code +CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] 3: Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.
AcT-type	integer type, indicates the type of access technology. This	Value range: (4,8) 4: E-UTRAN (WB-S1 mode) 8: NG-RAN (N1 mode)

Name	Description	Value
	AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.	
Requested_eDRX_value	string type; half a byte in a 4 bit format.	The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.
NW-provided_eDRX_value	string type; half a byte in a 4 bit format	The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.
Paging_time_window	string type; half a byte in a 4 bit format	The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CEDRXS? ❶
+CEDRXS: 4, "0000"
+CEDRXS: 8, "0000"

OK

AT+CEDRXS=1,4, "0011" ❷
OK

AT+CEDRXS=? ❸
+CEDRXS: (0-3),(4,8), ("0000"-"1111")

OK
```

- ❶ Read current settings.
- ❷ Set the EDRX parameters
- ❸ Example Query the supported parameters.

5.19 +CEDRXRDP, eDRX read dynamic parameters

Description

The execution command returns <AcT-type> and <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if eDRX is used for the cell that the MS is currently registered to.

If the cell that the MS is currently registered to is not using eDRX, AcT-type=0 is returned.

Format

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

parameter
range

Parameter

Name	Description	Value
AcT-type	integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.	Value range: (4,8) 4: E-UTRAN (WB-S1 mode) 8: NG-RAN (N1 mode)
Requested_eDRX_value	string type; half a byte in a 4 bit format.	The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.
NW-provided_eDRX_value	string type; half a byte in a 4 bit format	The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.
Paging_time_window	string type; half a byte in a 4 bit format	The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see clause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CEDRXRDP ❶
+CEDRXRDP: 4, "0011", "0110", "0110"
```

```
OK
```

```
AT+CEDRXRDP=? ❷
```

```
OK
```

❶ Execute command to get current settings.

❷ Example Query the supported parameters.

5.20 +GTRXPWR, Signal Receiving Indication

Description

This command is used to get received signal power, i.e., RSRP, RSRQ and RSSI for both physical antennas. Only read command is applied. Read command returns the corresponding parameter values for Rx[0] and Rx[1] respectively.

Format

Type	Command	Response
Read current settings	AT+GTRXPWR?	Response: +GTRXPWR: 0,<Rsrp0>,<Rsrq0>,<Rssi0> +GTRXPWR: 1,<Rsrp1>,<Rsrq1>,<Rssi1> OK

Parameter

Name	Description	Value
Rsrp0	reference signal receiving power for Rx[0]	float type; negative;
Rsrq0	reference signal receiving quality for Rx[0]	float type; negative;
Rssi0	received signal strength indication for Rx[0]	float type; negative;
Rsrp1	reference signal receiving power for Rx[1]	float type; negative;
Rsrq1	reference signal receiving quality for Rx[1]	float type; negative;
Rssi1	received signal strength indication for Rx[1]	float type; negative;

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GTRXPWR? ❶
+GTRXPWR: 0, -81.7, -11.4, -50.3
+GTRXPWR: 1, -83.2, -12.8, -50.4

OK

```

❶ Query receiving signals.

5.21 +GTREJECTCAUSE, reject cause reporting

Description

This command is used to control the reporting of rejection reasons of EMM, 5GMM, ESM and 5GSM

Format

Type	Command	Response
Setting command	AT+GTREJECTCAUSE=<reporting>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTREJECTCAUSE?	+GTREJECTCAUSE: <reporting> OK
Query command parameter range	AT+GTREJECTCAUSE=?	+GTREJECTCAUSE: (list of supported <reporting>s)
		OK

Parameter

Name	Description	Value
reporting	Whether to report the network rejecti cause	Type: integer <ul style="list-style-type: none"> • 0: Disable network rejecti cause report • 1: Enable network rejecti cause report +EMM ERROR: cause

Name	Description	Value
		or +ESM ERROR: cause or +5GMM ERROR: cause or • +5GSM ERROR: cause
cause	Reject cause code for registration failure or bearer activation failure	Type: integer Value range can be referred to 3GPP24301 Annex A 3GPP24301 Annex B 3GPP24501 Annex A 3GPP24501 Annex B

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTREJECTCAUSE? ❶

+GTREJECTCAUSE: 0

OK

AT+GTREJECTCAUSE=1 ❷

OK

+ESM ERROR: 27 ❸

- ❶ Read current settings.
- ❷ Set to enable reject cause
- ❸ reject cause report

5.22 +GTCELLINFO, Get Serving Cell Information

Description

This command is used to acquire the current serving cell information.

Format

Type	Command	Response
Setting command	AT+GTCELLINFO=<mode>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTCELLINFO?	+GTCELLINFO: <mode> [LTE: CQI: <cqi> Power: <power> RANK: <rank> DLMCS: <dlmcs> ULMCS: <ulmcs> [TX_LTE_QCI: <tx_lte_qci>] [RX_LTE_QCI: <rx_lte_qci>]] [NR5G: SSB_BeamID: <ssb_beamid> NR_CQI: <nr_cqi> NR_Power: <nr_power> NR_RANK: <nr_rank> NR_DLMCS: <nr_dlmcs> NR_ULMCS: <nr_ulmcs> [TX_5G_QCI: <tx_5g_qci>] [RX_5G_QCI: <rx_5g_qci>]] OK
Query command parameter range	AT+GTCELLINFO=?	+GTCELLINFO: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	Whether to open or close this function	Type: integer <ul style="list-style-type: none"> 0: Disable this function(default) 1: Enable this function
cqi	Channel quality indicator of LTE.	Type: integer Range is 0-15
power	Transmission power of LTE.	Type: integer
rank	Downlink Rank of LTE.	Type:string
dlmcs	Downlink MCS of LTE.	Type: integer Range is 0-31
ulmcs	Uplink MCS of LTE.	Type: integer Range is 0-31
ssb_beamid	SSB Beam ID of NR.	Type: integer Range is 0-63
nr_cqi	Channel quality indicator of NR.	Type: integer Range is 0-15
nr_power	Transmit power of a CPE of NR.	Type: integer
nr_rank	Downlink Rank of NR.	Type:string Range is RANK1-RANK8
nr_dlmcs	Downlink MCS of NR.	Type: integer Range is 0-31
nr_ulmcs	Uplink MCS of NR.	Type: integer Range is 0-31
tx_lte_qci	Tx QCI of LTE.	Type: integer
rx_lte_qci	Rx QCI of LTE.	Type: integer
tx_5g_qci	Tx QCI of NR.	Type: integer
rx_5g_qci	Rx QCI of NR.	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

AT+GTCELLINFO? ❶

+GTCELLINFO: 0

OK

AT+GTCELLINFO=1 ❷

OK

AT+GTCELLINFO? ❸

+GTCELLINFO: 1

LTE:

CQI: 8

Power: 3

RANK: RANK1

DLMCS: 1

ULMCS: 18

OK

- ❶ Read current settings.
- ❷ Set to enable getting Serving Cell Information.
- ❸ acquire the current serving cell information.

5.23 +SIMLOCKCFG, configure the PLMN whitelist

Description

This command is used to configure the PLMN whitelist of the SIMLOCK function. The setting is effective after restart.

Format

Type	Command	Response
Setting command	AT+SIMLOCKCFG=<ACTION>[,<PLMN List>]	Response 1: OK
		Response 2:

Type	Command	Response
		ERROR
Read current settings	AT+SIMLOCKCFG?	Response 1: +SIMLOCKCFG: <ACTION> OK Response 2: ERROR

Parameter

Name	Description	Value
ACTION	SIMLOCK enable switch	0: Disable the SIMLOCK function and the <PLMN List> will be cleared. 1: Enable the SIMLOCK function and the <PLMN List> is mandatory.
PLMN List	SIMLOCK PLMN whitelist	Type: string It should be enclosed in double quotation marks (""), supporting a maximum of 15 PLMNs, separated by English character comma (,).

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	5000	Max Result Returning Duration (ms)	5000

Example

AT+SIMLOCKCFG=1, "46000,46001,46002" ①

OK

AT+SIMLOCKCFG=0 ②

OK

AT+SIMLOCKCFG? ③

+SIMLOCKCFG: 0

OK

① The <PLMN List> to be locked is required for enabling the SIMLOCK function.

② The <PLMN List> list will be cleared when SIMLOCK function is disabled.

③ Query the <PLMN List> currently locked.

5.24 +SIMLOCKSTATE, query current SIMLOCK state of module

Description

This command is used to query the current SIMLOCK state of the module.

Format

Type	Command	Response
Read current settings	AT+SIMLOCKSTATE?	Response 1: +SIMLOCKSTATE: <STATE> OK Response 2: ERROR

Parameter

Name	Description	Value
STATE	Current SIMLOCK state of the module	UNLOCK: The value is UNLOCK if the SIMLOCK enable switch is off <STATE>. VALID SIM: The value of <STATE> is VALID SIM if the SIMLOCK enable switch is on and the relevant PLMN of the inserted SIM card is included in the <PLMN List>. INVALID SIM: The value of <STATE> is INVALID SIM if the SIMLOCK enable switch is on and the relevant PLMN of the inserted SIM card is included in the <PLMN List>. If the SIM card is not inserted, an ERROR is returned.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+SIMLOCKSTATE?

❶

+SIMLOCKSTATE:UNLOCK

OK

❶ Query the current SIMLOCK state of the module.

5.25 +SIMLOCKOPR, modify the PLMN list added by +SIMLOCKCFG

Description

This command is used to add or remove specific PLMN entries from the PLMN list configured with the +SIMLOCKCFG command.

Format

Type	Command	Response
Setting command	AT+SIMLOCKOPR=<ACTION>,<PLMN>	Response 1: OK Response 2: ERROR

Parameter

Name	Description	Value
ACTION	Set the operation type of the current command.	0: Add a new PLMN to the end of the PLMN list configured with the +SIMLOCKOPR command. 1: Remove the same PLMN entry as <PLMN> from the PLMN list configured with the +SIMLOCKOPR command.
PLMN	The PLMN to be added or deleted must be enclosed in double quotation marks ("").	PLMN consists of MCC and MNC.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	5000	Max Result Returning Duration (ms)	5000

Example

AT+SIMLOCKOPR=0,"46011" ①

OK

AT+SIMLOCKOPR=1,"46011" ②

OK

① Query the current SIMLOCK state of the module.

- ② Remove the PLMN specified in the list.

5.26 +GTREJCAUSE, get the cause value for network failure

Description

This command is used to get the cause value for network registration or activation failure

Format

Type	Command	Response
Setting command	AT+GTREJCAUSE=<enable_report>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTREJCAUSE?	+GTREJCAUSE: <type>,<cause>,<time>[,<mcc>,<mnc>] OK
Query command	AT+GTREJCAUSE=?	+GTREJCAUSE: (list of supported <enable_report>s) OK

Parameter

Name	Description	Value
enable_report	Report the GTREJCAUSE value is enabled. If the value is set to 1, the system automatically reports the GTREJCAUSE value when the network rejects it	Type: integer Value Range: 0-1 0: disables active reporting 1: Reports GTREJCAUSE after being rejected by the network The default value is 0, indicating that active reporting is disabled
cfg_type	Enable reporting of GTREJCAUSE value, set to 1, and if rejected by the network, it will be reported	Type: integer 0: Disable network rejecti cause report

Name	Description	Value
		1: Enable network rejecti cause report 2: Enable network rejecti cause report, Add PLMN information 101 Enable GTREJCAUSE for 5gsm type and NR Deregistration request to obtain information 102 Disable GTREJCAUSE for 5gsm type and NR Deregistration request to obtain information
type	Cause type	Type: integer 0: EMM cause 1: ESM cause 10: 5GMM CAUSE 11: 5GSM CAUSE
cause	Cause value	Type: integer 0~111 Refer to 3GPP protocol documents 24301, 24.501
time	The time of rejection	Type: string
mcc	Country code	Type: integer
mnc	Operator network code	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTREJCAUSE?

+GTREJCAUSE: 0,15,"23/09/28,18:22:44+32"

OK

AT+GTREJCAUSE=2

OK

+GTREJCAUSE: 0,19,"80/01/06,00:10:57+00",234,15

+GTREJCAUSE: 1,27,"80/01/06,00:10:57+00",234,15

AT+GTREJCAUSE?

+GTREJCAUSE: 0,19,"80/01/06,00:11:39+00",234,15

OK

Note

Currently, some cause for LTE and NR in the FG132 project cannot be displayed or displayed incorrectly. The specific scenarios and cause values are as follows:



Currently, EMM CAUSE does not support cause #19 #25 for handling LTE Attach reject, and does not support cause #5, #35, and #42 for handling Detach request with LTE-dettach not reattach scenarios

ESM CAUSE handles LTE-PDN connectivity reject not supported #113 handles LTE-PDN connectivity deactive not supported #24, #25, #40, #48, #113

5GMM CAUSE processing REGISTRATION REJECT does not support cause#31,#74,#75,#76

6 Call Control

6.1 D, dial command

Description

This command makes a data or voice call on the current network.



If a data call is initiated and answered by a remote party, an "OK" notification is sent to the terminal from the module, and it enters the online data state.

For more information about call failures, use the AT+CEER command.

Format

Type	Command	Response
Call command	ATD<number>[:]	<p>For voice call:</p> <p>OK</p> <p>When a voice call is connected, "OK" or "CONNECT" will displayed or nothing will be displayed (depending on the +MDC settings).</p> <p>The first OK means that the command was executed successfully.</p> <p>For CSD call:</p> <p>When a CSD call is connected, "OK" or "CONNECT" will displayed or nothing will be displayed (depending on the +MDC settings).</p> <p>If the initiated call fails, the following reasons are returned:</p> <ul style="list-style-type: none">• Connection failed: NO CARRIER, BUSY or NO ANSWER• General error: ERROR• Security reasons (such as SIM card does not exist): SIM card not inserted• Unknown reason: UNKNOWN CALLING ERROR

Parameter

Name	Description	Value
number	Phone number or spcial number	Type: string

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
-------------------------	-----	------------------------------	-----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	30000	Max Result Returning Duration (ms)	30000

Example

ATD18589061179; ①

OK ②

OK ③

NO CARRIER ④

ATD18589061179;

OK

NO ANSWER ⑤

ATD18589061179;

OK

ATD18589061179;

BUSY ⑥

- ① Make a call
- ② Command executed successfully
- ③ Successful answer
- ④ Hang up
- ⑤ No answer
- ⑥ Continuous sending instruction report BUSY

6.2 H, hang-up call

Description

This command hangs up call. The module terminates all call regardless it is a data or voice call, and whether it is an incoming, originating, waiting, or connected call.

An OK is returned to indicate that the command responded correctly, followed by a NO CARRIER message when disconnected.

Format

Type	Command	Response
Hang up command	ATH	Response 1: OK NO CARRIER

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	30000	Max Result Returning Duration (ms)	30000

Example

```

RING      ①
ATH       ②
OK        ③

NO CARRIER ④

```

- ① Receive an incoming call.
- ② Hang up.
- ③ The command is successfully sent.
- ④ Hang up.

6.3 A, answer incoming call

Description

This command is used to answer an incoming voice/data call when the RING/+CRING indication is sent to the terminal.

If the incoming call has been answered (CSD linked), the module will send a connection indication to the terminal.

If an MT call fails, the indications that may be returned are:

- NO CARRIER: connection failed
- ERROR: general failure

Format

Type	Command	Response
Response command	ATA	Response 1: OK
		Response 2: ERROR

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

```

RING      ①
ATA       ②
OK        ③

```

- ① Receive an incoming call.
- ② Answer the incoming call.
- ③ Successful answer

6.4 +CRC, cellular result codes and RING, +CRING incoming call indication

Description

This command controls whether to present the extended format of an incoming call indication. The RING/+CRING indication is sent from the Modem to the terminal when the Modem is alerted by an incoming call from the network. After this indication is sent, information is available on the calling line via +CLIP. When +CRC is disabled, the indication is RING, and when +CRC is enabled, the indication is +CRING: <type>.

Format

Type	Command	Response
Setting command	AT+CRC=<mode>	OK
Read current settings	AT+CRC?	+CRC: <mode> OK
Query command parameter range	AT+CRC=?	+CRC: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	Mode	Type: integer <ul style="list-style-type: none"> 0: disables extended format (default value). 1: enables extended format.
type	Type	Type: string <p>ASYNCRING [,<priority>[,<subaddr>,<satype>]]:</p> <p>asynchronous transparent</p> <p>SYNCRING [,<priority>[,<subaddr>,<satype>]]:</p> <p>synchronous transparent</p> <p>REL ASYNCRING [,<priority>[,<subaddr>,<satype>]]:</p>

Name	Description	Value
		asynchronous non transparent REL SYNC [,<priority>[,<subaddr>,<satype>]]: synchronous non transparent FAX [,<priority>[,<subaddr>,<satype>]]: facsimile (TS 62) VOICE [,<priority>[,<subaddr>,<satype>]]: voice (TS 11) VOICE/VIDEO [,<ccidx>[,<priority>[,<subaddr>,<satype>]]]: voice or video call
type	Type	Type: string VOICE/XXX [,<priority>[,<subaddr>,<satype>]]: voice followed by data (BS 81) (XXX is ASYNC, SYNC, REL ASYNC or REL SYNC) ALT VOICE/XXX [,<priority>[,<subaddr>,<satype>]]: alternating voice/data, voice first (BS 61) ALT XXX/VOICE [,<priority>[,<subaddr>,<satype>]]: alternating voice/data, data first (BS 61) ALT VOICE/FAX [,<priority>[,<subaddr>,<satype>]]: alternating voice/fax, voice first (TS 61)
type	Type	Type: string ALT FAX/VOICE [,<priority>[,<subaddr>,<satype>]]: alternating fax/voice, fax first (TS 61) GPRS <PDP_type>, <PDP_addr>[, [<L2P>][,<APN>]]: GPRS network requests for PDP context activation VGC <GCA>, <GId>, <ackflag> [,<priority>]: voice group call (TS 91) VBC <GCA>, <GId>, <ackflag> [,<priority>]: voice broadcast call (TS 92)

- The <type>=VOICE/VIDEO is used for voice and/or video calls. It is implementation specific whether this type will replace the <type>=VOICE or if both the types <type>=VOICE/VIDEO and <type>=VOICE are supported.
- <priority>: indicates the eMLPP priority level of the incoming call by paging, notification or setup message. The priority levels are defined in eMLPP specification of 3GPP TS 22.067 [54].
- <subaddr>: string type, sub address of format specified by <satype>.
- <satype>: type of sub address octet in integer format (see 3GPP TS 24.008 sub-clause 10.5.4.8) or RFC 4715 [122] appendix A.
- <ccidx>: integer type. Call identification number, see +CLCCS.
- <PDP_type>, <PDP_addr> and <APN>: string types as defined in the "+CGDCONT, define PDP context" command.
- <L2P>: string type, which defines the layer 2 protocol used between MT and TE in the "+CGDATA, enter GPRS data mode" command. The type proposes a layer 2 protocol to use between the MT and the TE. It is defined in the "+CGDATA, enter GPRS data mode" command.
- <GCA>: string type (consisting of digits only). It is a part of the group call reference as specified in

3GPP TS 23.003 [7] and indicates group call area. For details, see the commands +CAJOIN, +CAREJ and +CALCC.

- <GId>: string type (consisting of digits only). It is a part of the group call reference as specified in 3GPP TS 23.003 [7] and indicates group call identification. For details, see the commands +CAJOIN, +CAREJ and +CALCC.
- <ackflag>: integer type. It proposes that a predefined confirmation procedure is to be used after the call is ended. + The value 1 indicates that a predefined confirmation procedure is to be used after the call is ended. The value 0 indicates that no confirmation procedure is required. For details, see the parameter <ack_flag> of command +CALCC.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CRC=? 1
+CRC: (0,1)

OK

AT+CRC=0 2
OK

RING 3

NO CARRIER 4

AT+CRC=1 5
OK

+CRING: VOICE 6

NO CARRIER

AT+CRC? 7
+CRC: 1

OK

```

- ❶ Query command parameter range.
- ❷ Set CRC mode to 0.
- ❸ Call indication is RING.
- ❹ Hang up.
- ❺ Set CRC mode to 1.
- ❻ Call indication is CRING.
- ❼ Read current settings.

6.5 +CLIP, identify calling line

Description

This command enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

The setting command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network. When $\langle n \rangle = 1$, the presentation of the calling line identity at the TE is enabled and when the calling subscriber allows, the unsolicited result code +CLIP: $\langle \text{number} \rangle, \langle \text{type} \rangle [, \langle \text{subaddr} \rangle, \langle \text{satype} \rangle [, \langle \text{alpha} \rangle] [, \langle \text{CLI_validity} \rangle]]$ is returned. It is manufacturer specific if this response is used when normal voice call is answered. The unsolicited result code +CLIP does not support numbers of the SIP URI format. When $\langle n \rangle = 0$, the presentation of the calling line identity at the TE with unsolicited result code +CLIP is disabled.



Some carriers do not support AT+CLIP?, such as Chinese carriers

Format

Type	Command	Response
Setting command	AT+CLIP=[$\langle n \rangle$]	Response 1: OK Response 2: ERROR
Read current settings	AT+CLIP?	+CLIP: $\langle n \rangle, \langle m \rangle$ OK
Query command parameter range	AT+CLIP=?	+CLIP: (list of supported $\langle n \rangle$ s) OK

Parameter

Name	Description	Value
n	Sets or shows the result code presentation status to	Type: integer

Name	Description	Value
	the TE	<ul style="list-style-type: none"> • 0: disable (default value) • 1: enable
m	Shows the subscriber CLIP/OIP service status in the network	Type: integer <ul style="list-style-type: none"> • 0: CLIP/OIP is not provided • 1: CLIP/OIP is provided • 2: unknown (for example, no network)
number	Phone number	Type: string
type	Type of address byte	Type: integer For details, see item 10.5.4.7 in TS 24.008 of 3GPP.
subaddr	Sub address	Type: string Sub address of format specified by <satype>
satype	Type of sub address octet	Type: integer For details, see item 10.5.4.8 in TS 24.008 of 3GPP.
alpha	Alphanumeric representation of <number> corresponding to the entry found in phone book; used character set should be the one selected with command Select TE Character Set +CSCS.	- -
CLI_validity	Provide details on why <number> does not contain a calling party BCD number	Type: integer <ul style="list-style-type: none"> • 0: CLI valid • 1: CLI has been withheld by the originator (see 3GPP TS 24.008 [8] table 10.5.13 5a/3GPP TS 24.008 code "Reject by user") • 2: CLI is not available due to interworking problems or limitations of originating network (see 3GPP TS 24.008 [8] table 10.5.13 5a/3GPP TS 24.008 code "Interaction with other service") • 3: CLI is not available due to calling party being of type payphone (see 3GPP TS 24.008 [8] table 10.5.13 5a/3GPP TS 24.008 code "Coin line/payphone") • 4: CLI is not available due to other reasons (see 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Unavailable")

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
-------------------------	-----	------------------------------	----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CLIP=? 1
+CLIP: (0,1)

OK

AT+CLIP=1 2
OK

+CLIP: "18589061179",129,"",0,,0 3

RING

+CLIP: "18589061179",129,"",0,,0

NO CARRIER 4
AT+CLIP? 5
+CLIP: 1,2

OK

AT+CLIP=0 6
OK

RING 7

NO CARRIER
AT+CLIP? 8
+CLIP: 0,2

OK

```

- 1 Query command parameter range.
- 2 Set CLIP mode to 1.
- 3 Display the CLI of the calling party.
- 4 Hang up.

- 5 Query current settings.
- 6 Set CLIP mode to 0.
- 7 Do not display the CLI of the calling party.
- 8 Query current settings.

6.6 +CCWA, call waiting

Description

This command controls the call waiting supplementary service, including the settings and the queries of the module and the network.

Parameter <n> is used to disable or enable the presentation of an unsolicited result code +CCWA: <number>,<type>,<class>,<alpha>,<CLI_validity> to the TE when call waiting service is enabled. The unsolicited result code +CCWA does not support numbers of the SIP URI format.

Format

Type	Command	Response
Setting command	AT+CCWA=[<n>[,<mode>,<class>]]	Response 1: OK Response 2: If <mode>=2 and the command is successfully executed: +CCWA: <status>,<class>[<CR><LF> +CCWA: <status>,<class> [...]] OK
Read current settings	AT+CCWA?	+CCWA: <n> OK
Query command parameter range	AT+CCWA=?	+CCWA: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Sets or shows the result code presentation status to the TE	Type: integer <ul style="list-style-type: none"> 0: disable (default value) 1: enable
mode	When the parameter <mode> is not given, network is not interrogated	Type: integer <ul style="list-style-type: none"> 0: disable 1: enable 2: query status
class	The sum of integers of a	Type: integer

Name	Description	Value
	class of information	<ul style="list-style-type: none"> • 1: voice (telephony) • 2: data (refers to all licensed services; if TA does not support values 16, 32, 64 and 128 when <mode>=2, this value may refer to only some bearer services) • 4: fax • 7: voice, data, and fax (default value) • 8: SMS • 16: data circuit synchronization • 32: data circuit asynchronization • 64: access with package • 128: access with dedicated PAD
status		Type: integer <ul style="list-style-type: none"> • 0: Not active • 1: Active
number	Phone number of calling address	Type: string Format: specified by <type>
type	Type of address octet	Type: integer For details, see item 10.5.4.7 in TS 24.008 of 3GPP.
satype	Type of sub address octet	Type: integer For details, see item 10.5.4.7 in TS 24.008 of 3GPP.
alpha	Alphanumeric representation of <number> corresponding to the entry found in phone book; used character set should be the one selected with command Select TE Character Set +CSCS.	--
CLI_validity	Provide details on why <number> does not contain a calling party BCD number	Type: integer <ul style="list-style-type: none"> • 0: CLI valid • 1: CLI has been withheld by the originator (see 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Reject by user") • 2: CLI is not available due to interworking problems or limitations of originating network (see 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Interaction with other service") • 3: CLI is not available due to calling party being of type payphone (see 3GPP TS 24.008 [8] table

Name	Description	Value
		10.5.135a/3GPP TS 24.008 code "Coin line/payphone")
		<ul style="list-style-type: none"> 4: CLI is not available due to other reasons (see 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Unavailable")
		For details, see item 10.5.4.30 in TS 24.008 of 3GPP.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CCWA=? 1
+CCWA: (0,1)

OK
AT+CCWA=1,2,1 2
+CCWA: 1,1

OK
ATD18589061179; 3
OK

OK 4

+CCWA: "18589061382",129,1 5

NO CARRIER 6

NO CARRIER 7
AT+CCWA? 8
+CCWA: 1

OK

```

AT+CCWA=0 ⑨

OK

AT+CCWA? ⑩

+CCWA: 0

OK

- ① Query command parameter range.
- ② Set call waiting display.
- ③ Module calls.
- ④ Establish a call connection.
- ⑤ Make a call to the module and display call waiting information.
- ⑥ Hang up.
- ⑦ Hang up.
- ⑧ Read current settings.
- ⑨ Disable call waiting display.
- ⑩ Read current settings.

6.7 +CHLD, call related supplementary service command

Description

This command controls the Call Hold and Multiparty Call services. This command manipulates voice calls only. The setting command allows the control of the following call related services:

Call Hold: A call can be temporarily disconnected from the module, but the connection is retained by the network.

MTPY (Multiparty) Call: Conference calls.

The network does not reserve more than one traffic channel for a mobile station, therefore the module can have only one call on hold at a time.

Format

Type	Command	Response
Setting command	AT+CHLD=<n>	<p>If the call is terminated: OK (approval request is submitted) NO CARRIER</p> <p>If the call state is changed (link, split, from active to hold, and so on): OK (approval request is completed)</p> <p>If the call is terminated and another call is answered: OK (call answered and is now connected) NO CARRIER</p>
Query command parameter range	AT+CHLD=?	+CHLD: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	--	Type: integer <ul style="list-style-type: none"> 0: Release all held calls or set User Determined User Busy (UDUB) for a waiting call. For Intel device, UDUB is set for waiting call and incoming call. And if both waiting call and incoming call coexist then only rejects the waiting call. 1: Release all active calls and accepts the held or waiting call. 1x: Release a specific call (x specific call number as indicated by +CLCC). 2: Place all active calls (if any exist) on hold and accept the other (held or waiting) call.
n	--	Type: integer For Intel device, the incoming caller held call or waiting call is accepted. Besides if only one call exists and it is active, place it on hold; If only held call exists then make it an active call. <ul style="list-style-type: none"> • • 3: Add a held call to the conversation. •

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	5000	Max Result Returning Duration (ms)	5000

Example

```
AT+CHLD=? 1
+CHLD: (0,1,1x,2,3)
```

```
OK
```

```
ATD18589061179; 2
```

```
OK
```

```
OK 3
```

```
AT+CHLD=1 4
```

OK

NO CARRIER

⑤

ATD18589061179;

⑥

OK

OK

⑦

+CCWA: "18589061382",129,1

⑧

AT+CHLD=2

⑨

OK

NO CARRIER

⑩

① Query command parameter range.

② Make a call.

③ Connection established successfully.

④ Release all calls in progress and accept calls on hold or waiting.

⑤ Hang up.

⑥ Make a call.

⑦ Connection established successfully.

⑧ Incoming call.

⑨ Place all active calls on hold and accept the other (held or waiting) call.

⑩ Hang up.

6.8 +CCFC, call forwarding number and conditions

Description

This command controls the call forwarding assistance service. Registration, erasure, activation, deactivation, and status query are supported.

Format

Type	Command	Response
Setting command	AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]	+CCFC: <status>,<class1>,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [<CR><LF>+CCFC: <status>,<class2>,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [...]] OK
Query command parameter range	AT+CCFC=?	+CCFC: (Support list <reason>s) OK

Parameter

Name	Description	Value
reason	Set call forwarding conditions	Type: integer <ul style="list-style-type: none"> • 0: no condition • 1: equipment busy • 2: no reply • 3: unreachable • 4: all call forwarding (refer to TS 22.030 [19] in 3GPP) • 5: all conditional call forwarding (refer to TS 22.030 [19] in 3GPP)
mode	Setting mode	Type: integer <ul style="list-style-type: none"> • 0: disable • 1: enable • 2: query status • 3: register • 4: erase
number	Phone number for forwarding address	Type: string Format: specified by <type>
type	Type of address byte	The default value is 145 when the dial string contains the international access code character +, otherwise it is 129. For details, see item 10.5.4.7 in TS 24.008 of 3GPP.
subaddr	<Subaddress specified by satype>	Type: string
satype	Type of sub address octet	Type: integer Default value: 128 For details, see item 10.5.4.8 in TS 24.008 of 3GPP.
class	The sum of integers of a class of information	Type: integer Default value: 1 <ul style="list-style-type: none"> • 1: voice (telephony) • 2: data (refers to all licensed services; if TA does not support values 16, 32, 64 and 128 when <mode>=2, this value may refer to only some bearer services) • 4: fax • 8: SMS • 16: data circuit synchronization • 32: data circuit asynchronization

Name	Description	Value
		<ul style="list-style-type: none"> • 64: access with package • 128: access with dedicated PAD
time	When no answer, all call forwarding, or all conditional call forwarding is queried, this parameter gives the time (in seconds) to wait before the call forwarding.	Type: integer Range: 1 to 30 Default value: 20
status	Status	Type: integer <ul style="list-style-type: none"> • 0: not activated • 1: activated

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CCFC=? 1
+CCFC: (0-5)

OK
AT+CCFC=4,3,"18589061179" 2
OK
AT+CCFC=4,0,"18589061179" 3
OK

```

- 1 Query command parameter range.
- 2 Set call forwarding.
- 3 Disable call forwarding.

6.9 +CLIR, calling line identification restriction

Description

This command instructs the module to query or disable the presentation of the CLI (calling line ID) of a MO call to the called party. The restriction of the CLI (disable presentation) is dependent on the network.



Some carriers do not support AT+CLIR?, such as Chinese carriers

Format

Type	Command	Response
Setting command	AT+CLIR=<n>	Response 1: OK Response 2: ERROR
Read current settings	AT+CLIR?	+CLIR: <n>,<m> OK
Query command parameter range	AT+CLIR=?	+CLIR: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Sets the adjustment for outgoing calls.	Type: integer <ul style="list-style-type: none"> 0: Presentation indicator is used according to the subscription of the CLIR/OIR service. 1: CLIR/OIR invocation 2: CLIR/OIR suppression (default value)
m	Shows the subscriber CLIR / OIR service status in the network.	Type: integer <ul style="list-style-type: none"> 0: CLIR/OIR not provisioned 1: CLIR/OIR provisioned in permanent mode 2: unknown (for example, no network) 3: CLIR/OIR temporary mode presentation restricted 4: CLIR/OIR temporary mode presentation allowed

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CLIR=? ❶

+CLIR: (0-2)

OK

AT+CLIR=1 ❷

OK

AT+CLIR? ❸

+CLIR: 1,2

OK

❶ Query command parameter range.

❷ Setting command.

❸ Query settings.

6.10 +CHUP, hang up call

Description

This command allows the module to hang up the current and held call.

Format

Type	Command	Response
Setting command	AT+CHUP	Response 1: OK
		Response 2: ERROR

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	30000	Max Result Returning Duration (ms)	30000

Example

AT+CHUP ❶

OK

NO CARRIER

❶ Hang up command.

6.11 +MDC, select desired messages to be displayed upon connection of a voice call

Description

This AT command enables you to select the desired messages to be displayed upon connection of a voice call.

Format

Type	Command	Response
Setting command	AT+MDC=<mode>	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+MDC?	+MDC: <mode> OK
Query command parameter range	AT+MDC=?	+MDC: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	Mode selection	Type: integer <ul style="list-style-type: none"> • 0: Return OK once voice call is connected. (default value) • 1: Return CONNECT once voice call connected. • 2: Display nothing.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MDC=?

①

+MDC: (0-2)

OK

AT+MDC=1 ②

OK

ATD18589061179;

OK

CONNECT ③

NO CARRIER ④

AT+MDC? ⑤

+MDC: 1

OK

AT+MDC=0 ⑥

OK

ATD18589061179;

OK

OK

NO CARRIER ⑦

AT+MDC=2 ⑧

OK

ATD18589061179;

OK

NO CARRIER ⑨

- ① Query command parameter range.
- ② Set to return CONNECT after the call is connected.
- ③ CONNECT is returned after the call is connected.
- ④ Hang up.
- ⑤ Query settings.
- ⑥ Set to return OK after the call is connected.
- ⑦ Hang up.
- ⑧ Set to display nothing after the call is connected.
- ⑨ Display nothing and hang up after the call is connected.

6.12 +CSTA, select address type

Description

This setting command selects the type of number for further dialing commands (D) according to GSM specifications.

Format

Type	Command	Response
Setting command	AT+CSTA=[<type>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CSTA?	+CSTA: <type> OK
Query command parameter range	AT+CSTA=?	+CSTA: (list of supported <type>s) OK

Parameter

Name	Description	Value
type	Dial string type	Type: integer <ul style="list-style-type: none"> 145: Dial string shall include international access code character "+". 129: Dial string begins with a digit or it is a local number. (default)

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CSTA=? ①

+CSTA: (129,145)

OK

AT+CSTA? ②

+CSTA: 129

OK

ATD18589061179;

OK

NO CARRIER

AT+CSTA=145

OK

ATD86+18589061179;

OK

OK

NO CARRIER

① Query command parameter range.

② Query current settings.

③ The dial string begins with a digit or is a local number.

④ Hang up.

⑤ Set the dial string to include international access code character "+".

⑥ Dial string shall include international access code character "+".

⑦ Answer.

⑧ Hang up.

6.13 +GTECC, write emergency number

Description

This command is used to write and read emergency number.

Format

Type	Command	Response
Setting command	AT+GTECC=<index>,<ecc_num>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTECC?	Response 1: [+GTECC: <index1>,<ecc_num>[<CR><LF>+GTECC: <index2>,<ecc_num>][...]] OK

Type	Command	Response
		Response 2: ERROR
Query command parameter range	AT+GTECC=?	+GTECC: (list of supported <index>s),<max_ecc_length> OK

Parameter

Name	Description	Value
index	Emergency number index	Type: integer Range: 1 to 5
ecc_num	Emergency number	Type: string Range: the maximum length is 15 bytes. Emergency number, for example: 0123456789*#
max_ecc_length	Maximum length of <ecc_num>	Type: integer Range: the maximum length is 15 bytes.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTECC=1, "01234567891" ①

OK

AT+GTECC=2, "0123456789*"

OK

AT+GTECC=3, "0123456789#"

OK

AT+GTECC=4, "0123456789#"

OK

AT+GTECC=5, "0123456789#"

OK

AT+GTECC? ②

+GTECC: 1, "01234567891"

```
+GTECC: 2,"0123456789*"
+GTECC: 3,"0123456789#"
+GTECC: 4,"0123456789#"
+GTECC: 5,"0123456789#"

```

OK

AT+GTECC=? 3

```
+GTECC: (1-5),15

```

OK

- ① Set emergency call number.
- ② Read emergency call number.
- ③ Read emergency call number.

6.14 +CPAS, phone activity status

Description

This command displays the current activity status of the module, such as a call in progress or ringing.

Format

Type	Command	Response
Read current status	AT+CPAS	Response 1: +CPAS: <pas> OK Response 2: ERROR
Query command parameter range	AT+CPAS=?	+CPAS: (list of support <pas>s) OK

Parameter

Name	Description	Value
pas	Displays terminal call status	Type: integer <ul style="list-style-type: none"> • 0: Ready (The module allows commands from the terminal) • 1: Ready (The module allows commands from the terminal, but the ringer is active) • 2: Ringing (MT calls) (The module is ready for commands from the terminal, but the ringer is active) • 3: Ringing (MT calls) (The module is ready for commands from the terminal, but the ringer is active) • 4: Call in progress (The Modem is ready for commands from the terminal, but a call is in progress)

Name	Description	Value
		progress)
		•
Characteristic		
Require SIM Card Normal	No	Require Network Registration No
Require Data Connection	No	Async or Sync Command Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms) 1000

Example

AT+CPAS=? ①

+CPAS: (0,3,4)

OK

AT+CPAS ②

+CPAS: 0 ③

OK

RING

AT+CPAS

+CPAS: 3 ④

OK

① Query command parameter range.

② Read the current terminal call status.

③ Current terminal status: Ready (The module allows commands from the terminal).

④ Current terminal status: Ringing (MT calls) (The module is ready for commands from the terminal, but the ringer is active).

6.15 +CLCC, list current calls

Description

This command displays a list of all current Modem calls and their statuses, and also enables or disables the unsolicited indication of the call list. (If no calls are received, no information response is sent to the terminal.)

If the command succeeds but no calls are available, no information response is sent to the terminal.

The maximum number of simultaneous multi party calls is 5+1 (5 in active group and 1 on hold).

Format

Type	Command	Response
Setting command	AT+CLCC=<state>	Response 1: OK Response 2: ERROR
Read current call list	AT+CLCC	+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,<number>,<type> > [<CR><LF> +CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,<number>,<type> >[...]] OK
Query current settings	AT+CLCC?	+CLCC: <state> OK
Query command parameter range	AT+CLCC=?	+CLCC: (list of supported <stat>s) OK

Parameter

Name	Description	Value
state	Disable or enable +CLCC unsolicited report	Type: integer <ul style="list-style-type: none"> 0: disable (default) 1: enable
idx	Call identification number as described in 3GPP TS 22.030 subclause 6.5.5.1. This number can be used in +CHLD command operations.	Type: integer N: The maximum number of simultaneous call control processes is determined by the vendor.
dir	Indicate to originate or terminate a call	Type: integer <ul style="list-style-type: none"> 0: mobile originated (MO) call 1: mobile terminated (MT) call
stat	Call status	Type: integer <ul style="list-style-type: none"> 0: active 1: hold 2: dial (MO call) 3: alerting (MO call) 4: incoming (MT call) 5: waiting (MT call)

Name	Description	Value
		<ul style="list-style-type: none"> • 6: release
mode	Bearer telephone service	Type: integer <ul style="list-style-type: none"> • 0: voice • 1: data • 2: fax • 3: voice followed by data, voice mode • 4: alternating voice/data, voice mode • 5: alternating voice/fax, voice mode • 6: voice followed by data, data mode • 7: alternating voice/data, data mode • 8: alternating voice/fax, fax mode • 9: unknown
mpty	Whether the call is one of multi party (conference) call parties	Type: integer <ul style="list-style-type: none"> • 0: call is not one of multi party (conference) call parties • 1: call is one of multi party (conference) call parties
number	Phone number for forwarding address	Type: string Format: specified by <type>
type	Type of address byte	Type: integer The default value is 145 when the dial string contains the international access code character +, otherwise it is 129. For details, see item 10.5.4.7 in TS 24.008 of 3GPP.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CLCC=?
+CLCC: (0,1)
```

```
OK
```

```
AT+CLCC? ②
+CLCC: 0

OK

AT+CLCC=1 ③
OK

RING

+CLCC: 4,1,4,0,0," 18589061179",129 ④
```

- ① Query command parameter range.
- ② Query current settings. The default setting is 0.
- ③ Set CLCC enabled.
- ④ Display a list of calls and their status.

6.16 +COLP, Connected Line Identity presentation

Description

Description

This command relates to the GSM supplementary service called COLP (Connected Line Identification), which enables a calling subscriber to obtain the Connected Line Identity (COL) of the called party after setting up a mobile-originated call with the Modem. For example, after setting up a mobile-originated call to one number that is forwarded to another number, the calling party will see the number of that third party. When this command is enabled (and the called subscriber permits it), the following intermediate result code is returned: +COLP: <number>,<type>[,<subaddr>,<satype>[,<alpha>]].



Some carriers do not support AT+COLP?, such as Chinese carriers

Format

Type	Command	Response
Setting command	AT+COLP=[<n>]	Response 1: OK
		Response 2: ERROR
Query current settings	AT+COLP?	+COLP: <n>,<m> OK

Type	Command	Response
Query command parameter range	AT+COLP=?	+COLP: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Sets or shows the result code presentation status to the TE	Type: integer <ul style="list-style-type: none"> 0: disable (default) 1: enable
m	Shows the subscriber COLP service status in the network	Type: integer <ul style="list-style-type: none"> 0: COLP/TIP not provisioned (default value) 1: COLP/TIP provisioned 2: unknown (for example, no network)
number	Phone number	Type: string
type	Type of address byte	Type: integer For details, see item 10.5.4.7 in TS 24.008 of 3GPP.
subaddr	Sub address	Type: string Sub address of format specified by <satype>
satype	Type of sub address octet	Type: integer For details, see item 10.5.4.8 in TS 24.008 of 3GPP.
alpha	Alphanumeric representation of <number> corresponding to the entry found in phone book; used character set should be the one selected with command Select TE Character Set +CSCS.	- -

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+COLP=?
+COLP: (0,1)

①

```

OK
AT+COLP=1      ❷
OK
ATD18589061179;
OK

OK

+COLP: "18589061179",129,, ,      ❸

NO CARRIER      ❹

```

- ❶ Query command parameter range.
- ❷ Enable connected Line Identity presentation.
- ❸ Answered after transfer.
- ❹ The caller will see the third party's number.
- ❺ Hang up.

6.17 +CAVIMS, Availability for Voice Calls with IMS

Description

This set command informs the MT whether the UE is currently available for voice calls with the IMS. Read command returns the UEs IMS voice call availability status stored in the MT.



If there is a modem configuration update or operator switch, such as software upgrades, and the new version modifies the relevant configuration of the modem, or replaces the SIM card with a different operator, etc , the FG132 platform will modify the IMS enable state to the recommended by the platform for this operator

Format

Type	Command	Response
Setting command	AT+CAVIMS=<state>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CAVIMS?	+CAVIMS: <state> OK
Query command parameter range	AT+CAVIMS=?	+CAVIMS: (list of supported <state>s) OK

Parameter

Name	Description	Value
state	The UEs IMS voice call availability status	Type: integer 0: Voice calls with the IMS are not available 1: Voice calls with the IMS are available(default)

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CAVIMS? ①

+CAVIMS:1

OK

AT+CAVIMS=? ②

+CAVIMS: (0,1)

OK

AT+CAVIMS=1 ③

OK

① Query if Voice calls with the IMS available .

② Query command parameter range.

③ Enable Voice calls with the IMS.

7 SMS

7.1 +CSCS, select terminal character set

Description

This command selects the module character set. The module supports the following character sets: "IRA", "GSM", "UCS2", and "HEX". The default value is IRA.

Format

Type	Command	Response
Setting command	AT+CSCS=<chset>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CSCS?	+CSCS: <chset> OK
Query command parameter range	AT+CSCS=?	+CSCS: (list of supported <chset>s) OK

Parameter

Name	Description	Value
chset	Character set	Type: string <ul style="list-style-type: none"> "IRA": International Reference Alphabet (ITU-T T.50) "GSM": GSM default alphabet (GSM 03.38 subclause 6.2.1) "UCS2": 2-byte Universal Character Set, Unicode (ISO/IEC 10646 [32]) "HEX": Character strings consist only of hexadecimal numbers from 00 to FF

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CSCS=? 1
+CSCS: ("IRA","GSM","UCS2","HEX")
```

```
OK
```

```
AT+CSCS? 2
+CSCS: "IRA"
```

```
OK
```

```
AT+CSCS="UCS2" 3
```

```
OK
```

1 Query command parameter range.

2 Read current settings.

3 Setting command.

7.2 +CSMS, select message service

Description

This command handles the selection of the message service. It returns the types of messages that are supported by the module.

Format

Type	Command	Response
Setting command	AT+CSMS=<service>	Response 1: +CSMS: <mt>,<mo>,<bm> OK Response 2: ERROR
Read current settings	AT+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm> OK
Query command parameter range	AT+CSMS=?	+CSMS: (list of <service>s) OK

Parameter

Name	Description	Value
service	--	Type: integer <ul style="list-style-type: none"> 0: SMS AT command grammar is compatible with GSM Phase 2 1: SMS AT command grammar is compatible with GSM Phase 2+

Name	Description	Value
mt	MT message	Type: integer <ul style="list-style-type: none"> • 0: Module not supported • 1: Module supported
mo	MO message	Type: integer <ul style="list-style-type: none"> • 0: Module not supported • 1: Module supported
bm	Broadcast type messages	Type: integer <ul style="list-style-type: none"> • 0: Module not supported • 1: Module supported

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CSMS=? ①

+CSMS: (0,1)

OK

AT+CSMS? ②

+CSMS: 0,1,1,1

OK

AT+CSMS=1 ③

+CSMS: 1,1,1

OK

① Query command parameter range.

② Read current settings.

③ Setting command.

7.3 +CPMS, preferred message storage

Description

This command handles the selection of the preferred message storage area. The message storage area is divided into three parts, mem1, mem2 and mem3.

Format

Type	Command	Response
Setting command	AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	Response 1: +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK Response 2: ERROR
Read current settings	AT+CPMS?	Response 1: +CPMS:<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> OK Response 2: ERROR
Query current parameter range	AT+CPMS=?	Response 1: +CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) OK Response 2: ERROR

Parameter

Name	Description	Value
mem1	Memory from which messages are read and deleted.	Type: string Range: 0 to n SM: (U)SIM message storage
mem2	Memory to which a write operation is performed.	Type: string Range: 0 to n SM: (U)SIM message storage
mem3	Memory to which received SMS are stored (unless forwarded directly to TE).	Type: string Range: 0 to n ME: ME message storage
usedx	The number of SMS messages used in memory <memx>	Type: integer The value ranges from 0 to n
totalx	Total SMS capacity of memory	Type: integer

Name	Description	Value
	<memx>	The value ranges from 0 to n

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CPMS=? ①
+CPMS: ("ME","SM"),("ME","SM"),("ME","SM")

OK

AT+CPMS? ②
+CPMS: "SM",4,50,"SM",4,50,"SM",4,50

OK

AT+CPMS="ME" ③
+CPMS: 0,50,4,50,4,50

OK

- ① Query command parameter range.
- ② Read current settings.
- ③ Setting command.

7.4 +CMGF, message format

Description

This command is a basic command.

The setting command handles the selection of the message format used with the send, list, read, and write commands, as well as the format of the unsolicited result codes resulting from message receipts.

The module supports both PDU mode (where entire TP data units are used) and text mode (where the message body and its headers are given as separate parameters).

Format

Type	Command	Response
Setting command	AT+CMGF=<mode>	Response 1:

Type	Command	Response
		OK
		Response 2: ERROR
Read current settings	AT+CMGF?	+CMGF: <mode> OK
Query current parameter range	AT+CMGF=?	+CMGF: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	SMS format	0: PDU mode (default value) 1: Text mode

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CMGF=? ①

+CMGF: (0,1)

OK

AT+CMGF? ②

+CMGF: 0

OK

AT+CMGF=1 ③

OK

- ① Query command parameter range.
- ② Read current settings.
- ③ Setting command.

7.5 +CSCA, service center address

Description

This command allows to write or read SCA to/from SIM. In SMS text mode, SCA stored in SIM is added to any stored and sent SMS. In SMS PDU mode, SCA stored in SIM is added to stored SMS and send SMS only when SCA address length coded in PDU equals zero.

Format

Type	Command	Response
Setting command	AT+CSCA=<sca>[,<tosca>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CSCA?	+CSCA: <sca>,<tosca> OK
Query current parameter range	AT+CSCA=?	OK

Parameter

Name	Description	Value
sca	- -	Type: string Range: 1 to 20 Service center address. "+" character prefix of <sca> indicates <tosca> of 145. Each character is represented by semi octets (excluding "+" character). If <sca> contains an odd number of digits, bits 4 to 7 of the last octet shall be filled with an end mark coded "1111".
tosca	Type of service center address	Range: 0 to 255 129 is mostly use for local number and 145 for international. Valid values are defined according to: GSM03.40 v7.4.0 section 9.1.2.5 as follows: Bit 7 is 1 Bits 6 5 4 - Present Type of number as follows: Bits 6 5 4 0 0 0: Unknown 0 0 1: International number 0 1 0: National number 0 1 1: Network specific number 1 0 0: Subscriber number 1 0 1: Alphanumeric, (coded according to GSM TS 03.38 7-bit default alphabet) 1 1 0: Abbreviated number

Name	Description	Value
		1 1 1: Reserved for extension; numbering-plan-identification (applies for Type-of-number = 000,001,010)
tosca	Type of service center address	Bits 3 2 1 0 0 0 0 0: Unknown 0 0 0 1: ISDN/telephone numbering plan (E.164/E.163) 0 0 1 1: Data numbering plan (X.121) 0 1 0 0: Telex numbering plan 1 0 0 0: National numbering plan 1 0 0 1: Private numbering plan 1 0 1 0: ERMES numbering plan (ETSI DE/PS 3 01-3) 1 1 1 1: Reserved for extension All other values are reserved.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CSCA=? ❶

OK

AT+CSCA? ❷

+CSCA: "+8613010888500",145

OK

AT+CSCA="+8616675548628",129 ❸

OK

❶ Query command parameter range.

❷ Read current settings

❸ Setting command.

7.6 +CSMP, set text mode parameters

Description

This command is a basic command and is used to select values for additional parameters required when SMS is sent to the network or placed in storage when the text mode is selected.

Format

Type	Command	Response
Setting command	AT+CSMP=[<fo>,<vp>,<pid>,<dc>]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dc> OK
Query current parameter range	AT+CSMP=?	OK

Parameter

Name	Description	Value
fo	- -	Type: integer Depending on command or result code.
vp	Validity period, depending on SMS-SUBMIT, TP-Validity-Period-Format bits setting.	Type: integer Depending on command or result code. <ul style="list-style-type: none"> 0 to 143: (TP-VP + 1) x 5 minutes (for example, 5 minutes intervals up to 12 hours) 144 to 167: 12 hours + ((TP-VP - 143) x 30 minutes) 168 to 196: (TP-VP - 166) x 1 day 197 to 255: (TP-VP - 192) x 1 week
pid	Protocol-Ident	Type: integer Range: 0 to 255
dc	An octet of the data encoding scheme representing the data encoding scheme of the data.	Type: integer 0: default value

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CSMP=?

1

OK

AT+CSMP? ②

+CSMP: , , 0, 0

OK

AT+CSMP=17,167,0,1 ③

OK

① Query command parameter range.

② Read current settings.

③ Setting command.

7.7 +CSDH, show text mode parameters

Description

This command controls whether detailed header information is shown in text mode result codes.

Format

Type	Command	Response
Setting command	AT+CSDH=[<show>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CSDH?	+CSDH: <show> OK
Query current parameter range	AT+CSDH=?	+CSDH: (list of supported <show>s) OK

Parameter

Name	Description	Value
show	- -	Type: integer <ul style="list-style-type: none"> 0: Do not display header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-SUBMITs in text mode; For SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>. Default value. 1: Display the values in result codes.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
-------------------------	-----	------------------------------	----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CSDH=? ❶

+CSDH: (0,1)

OK

AT+CSDH? ❷

+CSDH: 0

OK

AT+CSDH=1 ❸

OK

❶ Query command parameter range.

❷ Read current settings.

❸ Setting command.

7.8 +CNMI, new message indications to terminal

Description

This command handles enabling of unsolicited notifications to the terminal when an SMS is received by the module. After sending an unsolicited response to the TE, the module will expect a +CNMA (new message acknowledgement) from the TE within a predefined timeout of 15 seconds. Within the timeout, the module will not send another unsolicited response to the TE before the previous one is acknowledged. If the module does not receive acknowledgement within the required time, CNMI parameters will not be reset automatically and the unsolicited response will send to the TE again.

Format

Type	Command	Response
Setting command	AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> > OK

Type	Command	Response
Query current parameter range	AAT+CNMI=?	+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) OK

Parameter

Name	Description	Value
mode	Controls how the TE is notified	Type: integer <ul style="list-style-type: none"> 0: Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications. The notification is cached and then sent according to the value of <mt>. 1: Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (for example, in on-line data mode). Otherwise forward them directly to the TE. 2: Buffer unsolicited result codes in the TA when TA-TE link is reserved (for example, in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.
mt	Set the contents of SMS storage and notification to TE	Type: integer <ul style="list-style-type: none"> 0: The received SMS is stored in the default memory location (including class 3) without notifying TE. 1: The received SMS is stored in the default memory location, and a notification (including class 3) is sent to TE. The notification form is: +CMTI: "SM",<index> 2: Store class 2 SMS in SIM card and send a notification to TE; for other classes, directly routed the SMS to TE+CMT. [<alpha>],<length><CR><LF><pdu>(PCU mode); or +CMT:<oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sc a>,<tosca>,<length>]<CR><LF><data>(text mode); 3: Class 3 SMS are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.
bm	- -	Type: integer <ul style="list-style-type: none"> 0: No CBM indications are routed to the TE. 1: If CBM is stored into ME/TA, indication of the memory location is routed to TE using unsolicited result code: + CBMI: < mem >, <index>

Name	Description	Value
		<p>New CBMs are routed directly to TE using unsolicited result code:</p> <p>+ CBM: <length> < CR > <LF> <pdu> (enabled in PDU mode)</p> <p>+CBM: <sn>,<mid>,<dc>,<page>,<pages><CR><LF><data> (enabled in text mode)</p>
bm	- -	<p>Type: integer</p> <p>Note:FG132 series not support for bm parameter of 1.</p> <ul style="list-style-type: none"> • 2: If ME supports data coding groups which define special routing also for messages other than class 3 (for example, (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1). Class 3 CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. • 3: If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.
ds	- -	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: No SMS-STATUS-REPORTs are routed to the TE (default value). • 1: SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: <ul style="list-style-type: none"> +CDS: <length><CR><LF><pdu> (enabled in PDU mode) +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (enabled in text mode) • 2: If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to TE using unsolicited result code: <mem>,<index>
bfr	- -	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: Default value. TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes). • 1: TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

AT+CNMI=? ①
 +CNMI: (0-2),(0-3),(0-3),(0-2),(0-1)

OK

AT+CNMI? ②
 +CNMI: 1,0,0,0,0

OK

AT+CNMI=1,2 ③
 OK

① Query command parameter range.

② Read current settings.

③ Setting command.

7.9 +CNMA, new message acknowledgement

Description

This command acknowledges the receipt of a +CMT and +CDS responses from the terminal to the module. A +CMT response receipt acknowledges the correct reception of a new SMS-DELIVER message, which was routed directly to the terminal. A +CDS response receipt acknowledges the correct reception of a new SMS-STATUS-REPORT message, which was routed directly to the terminal.

When the module sends a +CDS response to the terminal, it waits a predefined timeout of 15 seconds for the +CNMA acknowledgement. The module will not send another +CDS result code to the terminal before the previous one is acknowledged, or the timeout expires.

When the module sends a +CMT response to the terminal, it waits a predefined timeout of 15 seconds for the +CNMA acknowledgement. The module will not send another +CMT result code to the terminal before the previous one is acknowledged, or the timeout expires. After receiving the +CNMA command, the module sends RP-ACK to the network. The acknowledged SMS will not be saved in message storage. If the command is executed but no acknowledgement is expected, or some other module related error occurs, the final result code +CMS ERROR: <err> is returned.

Format

Type	Command	Response
Setting command	For text mode (+CMGF=1) AT+CNMA	Response 1: OK
	For PDU mode (+CMGF=0) AT+CNMA[=<n>[,<length>[<CR>PDU<ctrl-Z/ESC>]]]	Response 2: ERROR

Type	Command	Response
Query command parameter range	AT+CNMA=?	Response 1: OK in text mode Response 2: +CNMA: (list of supported <n>s) in PDU mode

Parameter

Name	Description	Value
n	--	Type: integer <ul style="list-style-type: none"> • 0: the command operations are similar to that defined for text mode • 1: send RP-ACK • 2: send RP-ERROR
length	PDU packet length for PDU mode	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CNMA=? ①

+CNMA: (0-2)

OK

AT+CNMA? ②

ERROR

AT+CNMA=1 ③

ERROR

① Query command parameter range.

② Read current settings.

③ Setting command.

7.10 +CMGL, list messages

Description

This command displays a list of all SMS with the status value <stat>, from the Modem message storage <mem1> (selected using the +CPMS command). The command returns a series of responses, each message contains the message index, status, and data. If the status of a message is "RECEIVED UNREAD", execution the +CMGL command can change the status of the message to "RECEIVED READ".

Format

Type	Command	Response
Setting command	AT+CMGL[=<stat>]	<p>If text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:</p> <p>+CMGL: <index>,<stat>,<oa/da>,<[alpha]>,<[scts]>,<[tooa/toda]>,
 <length>]<CR><LF><data>]<CR><LF> OK</p> <p>+CMGL: <index>,<stat>,<da/oa>,<[alpha]>,<[scts]>,<[tooa/toda]>,
 <length>]<CR><LF><data>[...]] OK</p> <p>If text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs:</p> <p>+CMGL: <index>,<stat>,<fo>,<mr>,<[ra]>,<[tora]>,<scts>,<dt>,
 <st>]<CR><LF> OK</p> <p>+CMGL: <index>,<stat>,<fo>,<mr>,<[ra]>,<[tora]>,<scts>,<dt>,
 <st>[...]] OK</p>
Setting command	AT+CMGL[=<stat>]	<p>If text mode (+CMGF=1), command successful and the status is SMS-COMMANDs</p> <p>+CMGL: <index>,<stat>,<fo>,<ct>]<CR><LF> +CMGL: <index>,<stat>,<fo>,<ct>][...]]</p> <p>If text mode (+CMGF=1), command successful and CBM storage:</p>

Type	Command	Response
		+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[<CR><LF> +CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[...]] Others: ERROR
Query command parameter range	AT+CMGL=?	+CMGL: (List of <stat>s supported by the command)
Parameter		
Name	Description	Value
alpha	Alpha ID of message (does not exist)	- -
stat	In-memory status of the message	In order to be compatible, that two modes can be use alternatively <ul style="list-style-type: none"> • 0: "REC UNREAD": messages received but unread (default value) • 1: "REC UNREAD": messages received and read • 2: "STO UNSENT": stored unsent messages • 3: "STO SENT": stored sent messages • 4: "ALL": all messages
index	1-352 stored message index	- -
oa/da	Source/target address	- -
data	Message content in text mode	- -
length	In PDU mode: contains the size of the message, in octal, excluding SMSC data. In text mode: the number of characters included in <data>.	- -
pdu	The message header and content are in PDU format. See interface description in "+CMGR, read message."	- -
tooa/toda	Source/target address type	- -
fo	First octet of the SMS	- -
mr	Message reference	- -

Name	Description	Value
ra	Recipient-address	- -
tora	Type of recipient address	- -
scts	Service center time stamp	- -
ct	Command type	- -
sn	Source/target address type	- -
mid	Message ID	- -
page	Current page number	- -
pages	Total number of pages	- -
st	Status	- -
dt	Discharge time	- -

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	10000	Max Result Returning Duration (ms)	10000

Example

```

AT+CMGL=? 1
+CMGL: ("REC UNREAD", "REC READ", "STO UNSENT", "STO SENT", "ALL")

OK
AT+CMGL="REC UNREAD" 2
OK

```

- 1 Query command parameter range.
- 2 Setting command.

7.11 +CMGR, read message

Description

This command is used to read SMS. The command displays the message in location <index> of the preferred message storage <mem1> (selected using the +CPMS command). If the status of the message is "RECEIVED UNREAD", the +CMGR command changes the status to "RECEIVED READ".

Format

Type	Command	Response
------	---------	----------

Type	Command	Response
Setting command	AT+CMGR=<index>	<p>Response 1:</p> <p>If text mode (+CMGF=1), command successful and SMS-DELIVER:</p> <p>+CMGR:</p> <p><stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p>
		<p>Response 2:</p> <p>If text mode (+CMGF=1), command successful and SMS-SUBMIT:</p> <p>+CMGR:</p> <p><stat>,<da>,[<alpha>],<toda>,<fo>,<pid>,<dcsc>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p>
Setting command	AT+CMGR=<index>	<p>Response 3:</p> <p>If text mode (+CMGF=1), command successful and SMS-REPORT:</p> <p>+CMGR:</p> <p><stat>,<fo>,<mr>,[<ra>],<tora>,<scts>,<dt>,<st></p> <p>OK</p>
		<p>Response 4:</p> <p>If text mode (+CMGF=1), command successful and SMS-COMMAND.:</p> <p>+CMGR:</p> <p><stat>,<fo>,<ct>[,<pid>,[<mn>],<da>],<toda>,<length>]<CR><LF><cdata>]</p> <p>OK</p>
		<p>Response 5:</p> <p>If text mode (+CMGF=1), command successful and CBM storage: +CMGR;:</p> <p><stat>,<sn>,<mid>,<dcsc>,<page>,<pages><CR><LF><data></p> <p>OK</p>
		<p>otherwise:</p> <p>ERROR</p>
Query command parameter range	AT+CMGR=?	OK

Parameter

Name	Description	Value
stat	In-memory status of the message	<p>In order to be compatible, that two modes can be use alternatively</p> <ul style="list-style-type: none"> • 0: "REC UNREAD": messages received but unread (default value) • 1: "REC UNREAD": messages received and read • 2: "STO UNSENT": stored unsent messages • 3: "STO SENT": stored sent messages • 4: "ALL": all messages
index	Index in storage of the message to be retrieved.	Type: integer The value starts form 1.
oa/da	Source/target address	- -
alpha	Alpha ID of message (does not exist)	- -
data	Message content in text mode	- -
length	In PDU mode: contains the size of the message, in octal, excluding SMSC data. In text mode: the number of characters included in <data>.	- -
pdu	The message header and content are in PDU format. See interface description in "+CMGR, read message."	- -
tooa/toda	Source/target address type	- -
fo	First octet of the SMS	- -
mr	Message reference	- -
ra	Recipient-address	- -
tora	Type of recipient address	- -
scts	Service center time stamp	- -
ct	Command type	- -
sn	Source/target address type	- -
mid	Message ID	- -
page	Current page number	- -

Name	Description	Value
pages	Total number of pages	- -
st	Status	- -
dt	Discharge time	- -
pid	Protocol-Ident	Type: integer Range: 0 to 255
dcs	An octet of the data encoding scheme representing the data encoding scheme of the data.	Type: integer 0: default value
sca	Address of the SMS service center	-
tosca	Type of the address of the SMS service center	-
vp	The validity period of the SMS message	-
mn	Mobile phone number parameters	-
cdata	Command-data	-

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

AT+CPMS?

①

+CPMS: "SM",8,50,"SM",8,50,"SM",8,50

OK

AT+CMGR=8

②

+CMGR: "REC UNREAD", "1068054171629", , "20/09/16,14:09:47+32"

8C

OK

- ❶ Query command parameter range.
- ❷ Setting command to read the 8th SMS.

7.12 +CMSS, send message from storage

Description

This command sends a pre-stored message, written previously using the +CMGW command. The <da> and <toda> parameters are optional. If a DA is given, the message is sent to that address. Otherwise the message is sent to the DA it was stored with (if any message was entered). If no DA is found, an error occurs.

When the given index is an incoming message index, the header settings are as follows:

- <first-octet> will be SMS-SUBMIT and VPF relative.
- The TP-RP and TP-UDHI settings will be taken from the incoming message's first octet.
- <vp> will be set to the default value -167 as defined in 03.40.
- <sca>, <tosca>, <pid> and <dcs> will be set according the incoming message parameters.
- If <da> and <toda> are not given by the command, the <oa> and <tooa> will be set instead.

Format

Type	Command	Response
Setting command	AT+CMSS=<index>[,<da>[,<toda>]]	Response 1: +CMSS: <mr> Response 2: ERROR
Query command parameter range	AT+CMSS=?	OK

Parameter

Name	Description	Value
index	Index in storage of the message to be retrieved.	Type: integer
da	Source/destination address, which contains a single phone number	Type: string
toda	DA type	Type: string The value ranges from 128 to 255 (according to GSM 03.40, 9.1.2.5). If this field is not given, and the first character of <da> is +, <toda> will be 145, otherwise it will be 129.
mr	Message reference	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	3000	Max Result Returning Duration (ms)	3000

Example

AT+CMSS=? ❶

OK

AT+CMSS=1 ❷

+CMSS: 234

OK

❶ Query command parameter range.

❷ Setting command.

7.13 +CMGW, write message to memory

Description

This command sends a pre-stored message, written previously using the +CMGW command. The <da> and <toda> parameters are optional. If a DA is given, the message is sent to that address. Otherwise the message is sent to the DA it was stored with (if any message was entered). If no DA is found, an error occurs.

When the given index is an incoming message index, the header settings are as follows:

- <first-octet> will be SMS-SUBMIT and VPF relative.
- The TP-RP and TP-UDHI settings will be taken from the incoming message's first octet.
- <vp> will be set to the default value -167 as defined in 03.40.
- <sca>, <tosca>, <pid> and <dcs> will be set according the incoming message parameters.
- If <da> and <toda> are not given by the command, the <oa> and <tooa> will be set instead.

Format

Type	Command	Response
Setting command	Command 1: If text mode (+CMGF=1): AT+CMGW[=<da>[,<toda>[,<stat>]]]<CR> text is entered <ctrl-Z/ESC>	Response 1: +CMGW: <index>
	Command 2: If PDU mode (+CMGF=0): AT+CMGW=<length>[,<stat>]<CR> PDU is given <ctrl-Z/ESC>	Response 2: ERROR

Parameter

Name	Description	Value
da	Destination address	Type: string String type represented in the currently selected character set
toda	Type of destination address	Type: integer 129: number in national format; 145: number in international format (contains the "+")
length	Indicates the length of the message body	Type: integer
stat	Message status	Type: integer "REC UNREAD": new received message unread (default for DELIVER messages) "REC READ": received message read "STO UNSENT": message stored not sent yet (default for SUBMIT messages) "STO SENT": message stored already sent
Index	Index number of the short message	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

AT+CMGW="8616675548628"

①

> 123

+CMGW: 10

0

① Setting command

7.14 +CMGD, delete message

Description

This command deletes a message from a memory <index> position, or deletes multiple messages based on <delflag>. If the optional parameter <delflag> is entered and its value is greater than 0, the <index> parameter is ignored. If the deletion fails, return result +CMS ERROR.

Format

Type	Command	Response
Setting command	AT+CMGD=<index>[,<delflag>]	Response 1: OK Response 2: ERROR
Query command parameter range	AT+CMGD=?	+CMGD: (valid values of <index>s),(valid values of <delflag>s) OK

Parameter

Name	Description	Value
index	Messages to be deleted in SMS memory index	Type: integer
delflag	Indicates multiple message deletion requests	Type: integer <ul style="list-style-type: none"> • 0: Delete the message specified in <index>. • 1: Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched. • 2: Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched. • 3: Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched. • 4: Delete all messages from preferred message storage including unread messages.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 2000

Max Result Returning Duration (ms) 2000

Example**AT+CMGD=?****①****+CMGD: (1,2,3,4,5,6,7,8,9,10),(0-4)**

OK

AT+CMGD=1,4**②**

OK

① Query command parameter range.**②** Setting command.

7.15 +CGSMS, select service for MO SMS messages

Description

This command handles the selection of the service or service preference used by the module to send mobile-originated SMS messages.

Format

Type	Command	Response
Setting command	AT+CGSMS=[<service>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGSMS?	+CGSMS: <service> OK
Query command parameter range	AT+CGSMS=?	+CGSMS: (list of currently available <service>s) OK

Parameter

Name	Description	Value
service	Indicates the service or service preference to be used	Type: integer <ul style="list-style-type: none"> 0: packet domain 1: circuit domain (recommended as the default value) 2: data domain first (circuit domain if GPRS is not available) 3: circuit domain first (data domain if circuit domain

Name	Description	Value
is not available)		
Characteristic		
Require SIM Card Normal	Yes	Require Network Registration No
Require Data Connection	No	Async or Sync Command Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms) 1000

Example

AT+CGSMS=? ❶

+CGSMS: (0-3)

OK

AT+CGSMS? ❷

+CGSMS: 1

OK

AT+CGSMS=0 ❸

OK

❶ Query command parameter range.

❷ Read current settings.

❸ Setting command.

7.16 +CMGS, send SMS to network

Description

This command sends an SMS from the Modem to the network. The message reference value <mr> is returned to the Modem upon successful delivery of the message.

Valid <tda> will be any value between 128-255. The header parameters in TEXT mode will be set according to CSMP settings.

Format

Type	Command	Response
Setting command	Command 1: If text mode (+CMGF=1): AT+CMGS=<da>[,<tda>]<CR> text is entered <ctrl-Z/ESC>	Response 1: If text mode (+CMGF=1) and the sending is successful: +CMGS: <mr>[,<scts>] OK

Type	Command	Response
	Command 2: If PDU mode (+CMGF=0): AT+CMGS=<length><CR> PDU is entered <ctrl-Z/ESC>	Response 2: If PDU mode (+CMGF=0) and the sending is successful: +CMGS: <mr> OK Response 3: If the sending failed: ERROR
Query command parameter range	AT+CMGS=?	OK

Parameter

Name	Description	Value
da	Destination IP address	Type: string The destination address needs to be enclosed in quotation marks. This field contains a single minimum value.
toda	Type of destination address	Type: integer The value ranges from 128 to 255 (according to GSM 03.40, 9.1.2.5). If this field is not given, and the first character of <da> is +, <toda> will be 145, otherwise it will be 129.
length	--	Type: integer Message size in PDU mode of this field contains a single minimum value, octal, excluding SMSC data.
mr	Referenced sequence number of the sent message	Type: integer
scts	SMS submission time stamp	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	3000	Max Result Returning Duration (ms)	3000

Example

AT+CMGS=?

1

OK

AT+CMGS="86166666666666"**2**

> 111

+CMGS: 82

OK

1 Query command parameter range.**2** Setting command.

7.17 +CSCB, cell broadcast messages

Description

This command handles the selection of cell broadcast message types and data coding schemes received by the module.

Format

Type	Command	Response
Setting command	AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	<p>If mode=0 and <mids> is not specified, then no channels are accepted, and the module channel or mid list is cleared.</p> <p>Response 1:</p> <ul style="list-style-type: none"> • OK • • Response 2: • • ERROR
Read current settings	AT+CSCB?	+CSCB: <mode>,<mids>,<dcss> OK
Query command parameter range	AT+CSCB=?	+CSCB: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	--	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: Message types specified in <mids> and <dcss> are accepted. • 1: Message types specified in <mids> and <dcss> are not accepted. Default value.

Name	Description	Value
mids	All different possible combinations of CBM message identifiers (refer <mid>)	Type: string Empty string by default.
dcss	All different possible combinations of CBM data coding schemes	Type: string Range: 0 to 255 Empty string by default.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CSCB=?           ❶
+CSCB: (0,1)
OK
AT+CSCB?           ❷
+CSCB: 0,"",""
OK
AT+CSCB=0           ❸
OK

```

- ❶ Query command parameter range.
- ❷ Query current settings.
- ❸ Setting command.

7.18 +SMMFULL, set unsolicited response (SMS storage space is full)

Description

This command handles unsolicited responses when SMS storage space is full, and if unsolicited responses are enabled, you will receive a message that storage space is full when you receive SMS.

Format

Type	Command	Response
------	---------	----------

Type	Command	Response
Setting command	AT+SMMFULL=<report_flag>	Response 1: OK Response 2: ERROR
Read current settings	AT+SMMFULL?	+SMMFULL: <report_flag> OK
Query command parameter range	AT+SMMFULL=?	+SMMFULL: (list of supported <report_flag> OK

Parameter

Name	Description	Value
report_flag	- -	Type: string <ul style="list-style-type: none"> • 0: Disable unsolicited response (default value) • 1: Enable unsolicited response This command does not apply to SG-9600-00.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+SMMFULL=? ❶

+SMMFULL: (0,1)

OK

AT+SMMFULL? ❷

+SMMFULL: 0

OK

AT+SMMFULL=0 ❸

OK

❶ Query command parameter range.

❷ Query current settings.

- ③ Setting command.

8 Data Packet Domain

8.1 +CGDCONT, define PDP context

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid> and also allows the TE to specify whether security protected transmission of ESM information is requested, because the PCO can include information that requires ciphering. There can be other reasons for the UE to use security protected transmission of ESM information, e.g. if the UE needs to transfer an APN. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

For EPS the PDN connection and its associated EPS default bearer is identified herewith.

For 5GS the PDU session and its associated QoS flow of the default QoS rule is identified herewith.

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

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

The test command returns values supported as compound values. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for each <PDP_type> are returned on a separate line.



If there is a modem configuration update or operator switch, such as software upgrades, and the new version modifies the relevant configuration of the modem, or replaces the SIM card with a different operator, etc , the FG132 platform will modify the PDP context info to recommended by the platform for this operator

Format

Type	Command	Response
Setting command	+CGDCONT=[<cid>,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]]]]]]]]]]]]]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGDCONT?	[+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4AddrAlloc>[,<request_type>

Type	Command	Response
		<p><P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]]]]]]]]][<CR><LF>+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<IPv4_AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NSLPI>[,<securePCO>[,<IPv4_MTU_discovery>[,<Local_Addr_Ind>[,<Non-IP_MTU_discovery>[,<Reliable_Data_Service>[,<SSC_mode>[,<S-NSSAI>[,<Pref_access_type>[,<RQoS_ind>[,<MH6-PDU>[,<Always-on_req>]]]]]]]]]]]]]</p> <p>[...]</p> <p>OK</p>
Query command parameter range	AT+CGDCONT=?	+CGDCONT: (range of supported <cid>s),,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported<Local_Addr_Ind>s),(list of supported <Non-IP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s),(list of supported <SSC_mode>s),,(list of supported <Pref_access_type>s),(list of supported <RQoS_ind>s),(list of supported <MH6-PDU>s),(list of supported

Type	Command	Response
		<p><Always-on_req>s)[<CR><LF>+CGDC ONT: (range of supported <cid>s),<PDP_type>,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IPv4AddrAlloc>s),(list of supported <request_type>s),(list of supported <P-CSCF_discovery>s),(list of supported <IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported <securePCO>s),(list of supported <IPv4_MTU_discovery>s),(list of supported<Local_Addr_Ind>s),(list of supported <Non-IP_MTU_discovery>s),(list of supported <Reliable_Data_Service>s),(list of supported <SSC_mode>s),(list of supported <Pref_access_type>s),(list of supported <RQoS_ind>s),(list of supported <MH6-PDU>s),(list of supported <Always-on_req>s) [...]</p> <p>OK</p>

Parameter

Name	Description	Value
cid	Specifies a particular PDP context definition.	<p>Type: integer</p> <p>This parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of allowed values is returned by the test form of the command. The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT. The cid max value is 16.</p>
PDP_type	Specifies the type of packet data protocol.	<p>Type: string</p> <ul style="list-style-type: none"> • IP: Internet Protocol (IETF STD 5 [103]) • IPV6: Internet Protocol, version 6 (see RFC 2460 [106])

Name	Description	Value
		<ul style="list-style-type: none"> • IPV4V6: Virtual <PDP_type> is introduced to handle dual IP stack UE capability. OSPf: Internet Hosted Octet Stream Protocol (obsolete) <p>Only IP, IPV6 and IPV4V6 values are supported for EPS services.</p>
APN	A logical name that is used to select the GGSN or the external packet data network.	<p>Type: string, max length is 62</p> <p>If the value is null or omitted, the subscription value will be requested.</p> <p>Note: It is recommended that the APN length not exceed 57; otherwise, the PDP activation may fail.</p>
PDP_addr	Identifies the MT in the address space applicable to the PDP.	<p>Type: string</p> <p>When +CGPIAF is supported, its settings affects the format of this parameter returned as a read of +CGDCONT.</p> <p>The value of this parameter is ignored with the setting command. The parameter is included in the setting command for backward compatibility reasons only.</p>
d_comp	Controls PDP data compression.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: off • 1: on • 2: V.42bis • 3: V.44
h_comp	Controls PDP header compression.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: off • 1: on • 2: RFC 1144 [105] (applicable for SNDCP only) • 3: RFC 2507 [107] • 4: RFC 3095 [108] (applicable for PDCP only)
IPv4AddrAlloc	Controls how the MT or TA requests to get the IPv4 address information.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: IPv4 address allocation through NAS signaling • 1: IPv4 address allocated through DHCP
request_type	Indicates the type of PDP context activation request for the PDP context.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: PDP context is used to establish a new PDP context or to perform a handover from a non-3GPP access network.

Name	Description	Value
		<ul style="list-style-type: none"> • 1: PDP context is for emergency bearer services <p>Only emergency calls are allowed if the PDP context for the emergency bearer service is the only active context. For details, see clause 4.3.12.9 of 3GPP TS 23.401.</p>
P-CSCF_discovery	Sets how MT/TA requests to obtain P-CSCF address.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: preference of P-CSCF address discovery not influenced by +CGDCONT. • 1: Preference of P-CSCF address discovery through NAS signalling. • 2: Preference of P-CSCF address discovery through DHCP.
IM_CN_Signalling_Flag_Ind	Indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.	<p>Type: integer</p> <ul style="list-style-type: none"> • 0: UE indicates that the PDP context is not for IM CN subsystem-related signalling only. • 1: UE indicates that the PDP context is for IM CN subsystem-related signalling only.
NSLPI	Indicates the NAS signalling priority requested for this PDP context	<p>Type: integer</p> <ul style="list-style-type: none"> • 0 indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT. • 1 indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signalling low priority".
securePCO	Specifies if security protected transmission of PCO is requested or not (applicable for EPS only).	<p>Type: integer</p> <ul style="list-style-type: none"> • 0 Security protected transmission of PCO is not requested • 1 Security protected transmission of PCO is requested
IPv4_MTU_discovery	influences how the MT/TA requests to get the IPv4 MTU size	<p>Type: integer</p> <ul style="list-style-type: none"> • 0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT • 1 Preference of IPv4 MTU size discovery through NAS signalling
Local_Addr_Ind	indicates to the network whether or not the MS supports local IP address in TFTs	<p>Type: integer</p> <ul style="list-style-type: none"> • 0 Indicates that the MS does not support local IP address in TFTs • 1 Indicates that the MS supports local IP

Name	Description	Value
		address in TFTs
Non-IP_MTU_discovery	influences how the MT/TA requests to get the Non-IP MTU size	Type: integer <ul style="list-style-type: none"> • 0 Preference of Non-IP MTU size discovery not influenced by +CGDCONT • 1 Preference of Non-IP MTU size discovery through NAS signalling
Reliable_Data_Service	indicates whether the UE is using Reliable Data Service for a PDN connection or not.	Type: integer <ul style="list-style-type: none"> • 0 Reliable Data Service is not being used for the PDN connection • 1 Reliable Data Service is being used for the PDN connection
SSC_mode	indicates the session and service continuity (SSC) mode for the PDU session in 5GS.	Type: integer <ul style="list-style-type: none"> • 0 Indicates that the PDU session is associated with SSC mode 1 • 1 Indicates that the PDU session is associated with SSC mode 2 •
S-NSSAI	The S-NSSAI is associated with the PDU session for identifying a network slice in 5GS. For the format and the encoding of S-NSSAI. This parameter shall not be subject to conventional character conversion as per +CSCS.	Type: string type in hexadecimal character format. Dependent of the form, the string can be separated by dot(s) and semicolon(s). The <S-NSSAI> has one of the forms: <p> sst only slice/service type (SST) is present sst;mapped_sst SST and mapped configured SST are present sst.sd SST and slice differentiator (SD) are present sst.sd;mapped_sst SST, SD and mapped configured SST are present sst.sd;mapped_sst.mapped_sd SST, SD, mapped configured SST and mapped configured SD are present </p>
Pref_access_type	indicates the preferred access type for the PDU session in 5GS.	Type: integer <ul style="list-style-type: none"> • 0 Indicates that the preferred access type is 3GPP access • 1 Indicates that the preferred access type is non-3GPP access
RQoS_ind	indicates whether the UE supports	Type: integer

Name	Description	Value
	reflective QoS for the PDU session.	<ul style="list-style-type: none"> • 0 Indicates that reflective QoS is not supported for the PDU session • 1 Indicates that reflective QoS is supported for the PDU session
MH6-PDU	indicates whether the UE supports IPv6 multi-homing for the PDU session.	Type: integer <ul style="list-style-type: none"> • 0 Indicates that IPv6 multi-homing is not supported for the PDU session • 1 Indicates that IPv6 multi-homing is supported for the PDU session
Always-on_req	indicates whether the UE requests to establish the PDU session as an always-on PDU session.	Type: integer <ul style="list-style-type: none"> • 0 Always-on PDU session is not requested • 1 Always-on PDU session is requested

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGDCONT=?

①

```
+CGDCONT: (1-16),"IP",,,(0-3),(0-4),(0,1),(0,1),,,,,,(0,1),,(0,1),,,(0,1)
+CGDCONT: (1-16),"IPv6",,,(0-3),(0-4),(0,1),(0,1),,,,,,(0,1),,(0,1),,,(0,1)
+CGDCONT: (1-16),"IPv4V6",,,(0-3),(0-4),(0,1),(0,1),,,,,,(0,1),,(0,1),,,(0,1)
```

OK

AT+CGDCONT?

②

```
+CGDCONT:
1,"IPv4V6","3gnet","0.0.0.0,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0,,,,,,,"",,,,0
+CGDCONT:
2,"IPv4V6","3gwap","0.0.0.0,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0,,,,,,,"",,,,0
+CGDCONT:
3,"IPv4V6","wonet","0.0.0.0,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0,,,,,,,"",,,,0
+CGDCONT:
4,"IPv4V6","ims","0.0.0.0,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,0,,,,,,,"",,,,0
+CGDCONT:
5,"IPv4V6","sos","0.0.0.0,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0",0,0,0,1,,,,,,,"",,,,0
```

OK

AT+CGDCONT=1,"IPV4V6","ctnet"

OK

③

① Query PDP context parameter range.

② Query PDP context parameters.

③ Set PDP context parameters.

8.2 +CGATT, packet domain attach or detach

Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Format

Type	Command	Response
Setting command	AT+CGATT=<state>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CGATT?	+CGATT: <state> OK
Query command parameter range	AT+CGATT=?	+CGATT: (list of supported <state>s) OK

Parameter

Name	Description	Value
state	PS domain status	Type: integer <ul style="list-style-type: none"> • 0: detach • 1: attach

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take	No	Require Data Store at Power Down	No

Effect

Max Response Duration (ms) 3000

Max Result Returning Duration (ms) 3000

Example

AT+CGATT=? ❶

+CGATT: (0,1)

OK

AT+CGATT? ❷

+CGATT: 0

OK

AT+CGATT=0 ❸

OK

❶ Query value range of relationship between MT and packet domain service.

❷ Query the current relationship between MT and packet domain service.

❸ Set MT to detach packet domain service.

8.3 +CGACT, activate or deactivate PDP context

Description

This command activates or deactivates the specified PDP context (s). The MT remains in V.250 command state after the command is executed. If any PDP context is already in the requested state, the state of that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

For EPS, if an attempt is made to disconnect the last PDN connection, then the MT responds with ERROR or, if extended error responses are enabled, a +CME ERROR.

Format

Type	Command	Response
Setting command	AT+CGACT=[<state>[,<cid>[,<cid>[,]]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGACT?	+CGACT: <cid>,<state><CR><LF> +CGACT:

Type	Command	Response
		<cid>,<state><CR><LF> +CGACT: <cid>,<state>
		OK
Query command parameter range	AT+CGACT=?	+CGACT: (list of supported <state>s)
		OK

Parameter

Name	Description	Value
state	PDP activation status	0: deactivate 1: activate
cid	Specifies a particular PDP context definition (see "+CGDCONT, define PDP context").	- -

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	30000	Max Result Returning Duration (ms)	30000

Example

AT+CGACT=? ①

+CGACT: (0,1)

OK

AT+CGACT? ②

+CGACT: 1,1

+CGACT: 2,1

+CGACT: 3,0

+CGACT: 4,0

OK

AT+CGACT=0,1 ③

OK

- ❶ Value range of activated or deactivated PDP contexts.
- ❷ Query PDP context status.
- ❸ Status of deactivated PDP contexts.

8.4 +CGPADDR, GPRS address

Description

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

Format

Type	Command	Response
Setting command	AT+CGPADDR[=<cid>[,<cid>[,]]]	+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [<CR><LF>+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]][...]]]
		OK
Query command parameter range	AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s) OK

Parameter

Name	Description	Value
PDP_addr_1, PDP_addr_2	Identifies the MT in the address space applicable to the PDP.	Type: string For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address, it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. When both IPv4 and IPv6 addresses are assigned, <PDP_addr_1> contains the IPv4 address and <PDP_addr_2> contains the IPv6 address.
cid	Specifies a particular PDP context definition (see "+CGDCONT, define PDP context").	- -

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGPADDR=?

①

+CGPADDR: (1,2,3,4)

OK

AT+CGPADDR=1

②

+CGPADDR: 1, "11.72.206.222", "36.8.132.113.11.23.37.114.0.0.0.0.0.0.1"

OK

① Value range of PDP address list

② Set the list of PDP addresses for the specified context identifier

8.5 +GTDNS, request DNS addresses

Description

This command is used to request primary and secondary DNS addresses when PDP context specified by profile id is activated.

Format

Type	Command	Response
Setting command	AT+GTDNS=<cid>	+GTDNS: <cid>,<Primary_DNS_addr>,<Secondary_DNS_addr> OK
Read current settings	AT+GTDNS?	+GTDNS: <cid1>,<Primary_DNS_addr1>,<Secondary_DNS_addr1> +GTDNS: <cid2>,<Primary_DNS_addr2>,<Secondary_DNS_addr2> ... +GTDNS: <cidn>,<Primary_DNS_addrn>,<Secondary_DNS_addrn> OK

Type	Command	Response
Query command parameter range	AT+GTDNS=?	+GTDNS: (list of defined <cid>s) OK

Parameter

Name	Description	Value
Primary_DNS_addr	Primary DNS address.	Type: string
Secondary_DNS_addr	Secondary DNS address.	Type: string
cid	Specifies a particular PDP context definition (see "+CGDCONT, define PDP context").	- -

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GTDNS=? 1
+GTDNS: (1)

OK
AT+GTDNS? 2
+GTDNS: 1,"202.96.128.86,100::100:1f00:e24","202.96.134.133,3300::100:1f00:e24"

OK
AT+GTDNS=1 3
+GTDNS: 1,"202.96.128.86,100::100:1f00:e24","202.96.134.133,3300::100:1f00:e24"

OK

```

- 1 Value range for requesting DNS address value.
- 2 Query requested DNS address.
- 3 Set to request DNS address.

8.6 +CGEREP, report packet domain event

Description

This command is used to enable or disable sending of unsolicited result codes.

Format

Type	Command	Response
Setting command	AT+CGEREP=[<mode>[,<bfr>]]	OK
Read current settings	AT+CGEREP?	+CGEREP: <mode>,<bfr> OK
Query command parameter range	AT+CGEREP=?	+CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK

Parameter

Name	Description	Value
mode	- -	Type: integer <ul style="list-style-type: none"> 0: Unsolicited result codes are buffered in the MT; if the MT result code buffer is full, the oldest buffer may be discarded without forwarding the result codes to the TE. 1: Discard unsolicited result codes when MT TE link is reserved (for example, in on line data mode); otherwise forward them directly to the TE. 2: Buffer unsolicited result codes in the MT when MT TE link is reserved (for example, in on line data mode) and flush them to the TE when MT TE link becomes available; otherwise forward them directly to the TE.
bfr	- -	Type: integer <ul style="list-style-type: none"> 0: MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered. 1: MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGEREP=? ❶

+CGEREP: (0-2),(0,1)

OK

AT+CGEREP? ❷

+CGEREP: 0,0

OK

AT+CGEREP=0,0 ❸

OK

❶ Parameter range of the enabled or disabled unrequested result code.

❷ Query the parameter value of the enabled or disabled unrequested result code.

❸ Clear MT buffer of unsolicited result codes defined within this command is cleared.

8.7 +CGAUTH, set PDP authentication parameters

Description

This command is used to set the authentication type (PAP/CHAP) and username and password for the specified PDP context. Unlike MGAUTH, the set username and password can be returned when reading the current setting.

Format

Type	Command	Response
Setting command	AT+CGAUTH=<cid>,<auth>[,<name>,<pwd>]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGAUTH?	+CGAUTH: <cid>,<auth>,<name>,<pwd>[<CR><LF>+CGAUTH: <cid>,<auth>,<name>,<pwd>[...]] OK
Query command	AT+CGAUTH=?	+CGAUTH: (list of supported

Type	Command	Response
parameter range		<cid>s),(list of supported <auth>s),(max length of supported<name>),(max length of supported<pwd>)
		OK

Parameter

Name	Description	Value
cid	Specific PDP context ID (see "+CGDCONT, define PDP context").	Type: integer Same as the value range of cid in the CGDCONT command.
auth	Authentication type	Type: integer 0: Authentication protocol is not used (NONE) 1: Password Authentication Protocol (PAP) 2: Challenge-Handshake Authentication Protocol (CHAP) 3: PAP and CHAP
name	Authentication username	Type: string The maximum length is 64 bytes.
pwd	Authentication password	Type: string The maximum length is 64 bytes.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGAUTH=?

+CGAUTH: (1-16),(0-3),64,64

OK

AT+CGAUTH?

+CGAUTH: 1,1,"user1","pwd1"

+CGAUTH: 2,2,"user2","pwd2"

OK

AT+CGAUTH=1,0

OK

8.8 +MGAUTH, set authentication type

Description

This command is used to set the type of PPP authentication (PAP/CHAP) and username and password for the specified PDP context.



If there is a modem configuration update or operator switch, such as software upgrades, and the new version modifies the relevant configuration of the modem, or replaces the SIM card with a different operator, etc, the FG132 platform will modify the auth info to recommended by the platform for this operator

Format

Type	Command	Response
Setting command	AT+MGAUTH=<cid>,<auth>[,<name>,<pwd>]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+MGAUTH?	Response 1: +MGAUTH: <cid>,<auth> ... OK
		Response 2: OK
Query command parameter range	AT+MGAUTH=?	+MGAUTH: (list of supported <cid>s),(list of supported <auth>s),(max length of supported<name>),(max length of supported<pwd>)
		OK

Parameter

Name	Description	Value
------	-------------	-------

Name	Description	Value
cid	Specifies a particular PDP context definition (see "+CGDCONT, define PDP context").	--
auth	--	Type: integer <ul style="list-style-type: none"> • 0: Authentication protocol is not used (NONE) • 1: Password Authentication Protocol (PAP) • 2: Challenge-Handshake Authentication Protocol (CHAP) • 3: PAP and CHAP
name	User name	Type: string Range: the maximum length is 64 bytes.
pwd	Password	Type: string Range: the maximum length is 64 bytes.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+MGAUTH=? 1
+MGAUTH: (1-16),(0-3),64,64
```

```
OK
```

```
AT+MGAUTH? 2
+MGAUTH: 1,0
+MGAUTH: 2,0
+MGAUTH: 3,0
+MGAUTH: 4,0
```

```
OK
```

```
AT+MGAUTH=1,0 3
```

```
OK
```

- 1 Set the value range of the authentication type parameters.
- 2 Query the set authentication type parameter values.

- 3 Set the authentication type parameter values.

8.9 +CGPIAF, printing IP address format

Description

This command decides what format to print IPV6 address parameters of other AT commands.

Format

Type	Command	Response
Setting command	AT+CGPIAF=[<IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>]]]	Response 1: OK Response 2: ERROR
Read current settings	AT+CGPIAF?	+CGPIAF: <IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros> OK
Query command parameter range	AT+CGPIAF=?	+CGPIAF: (list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressZeros> OK

Parameter

Name	Description	Value
IPv6_AddressFormat	IPv6 address format	Type: integer <ul style="list-style-type: none"> 0: use dot symbols like IPv4 1: use colon symbols like IPv6
IPv6_SubnetNotation	Subnet notation for remote address and subnet mask	Type: integer <ul style="list-style-type: none"> 0: IP address and subnet mask are separated by spaces 1: CIDR notation: IP address/Number of digits of

Name	Description	Value
		network ID
IPv6_LeadingZeros	Determines whether leading zeros are omitted	Type: integer <ul style="list-style-type: none"> 0: IP address and subnet mask are separated by spaces 1: CIDR notation: IP address/Number of digits of network ID
IPv6_CompressZeros	Determines whether to replace 1-n instance of 16-bit zero values with '::'	Type: integer <ul style="list-style-type: none"> 0: No zero compression, for example: "2001:DB8:0:CD30:0:0:0:0" 1: Zero compression is used, for example: "2001:DB8:0:CD30::". <p>Applicable only once, if <IPv6_AddressFormat> = 0, the setting does not applicable.</p>

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CGPIAF=? ①
+CGPIAF: (0,1),(0,1),(0,1),(0,1)
```

OK

```
AT+CGPIAF? ②
+CGPIAF: 0,0,0,0
```

OK

```
AT+CGPIAF=0,0,0,0 ③
```

OK

- ①** Set the value range for the format of the IPv6 address parameter.
- ②** Query the format of the IPv6 address parameter.
- ③** Set the format of the IPv6 address parameter.

8.10 +CGCONTRDP, PDP context read dynamic parameters

Description

This command is used to return the PDP context dynamic parameters.

Format

Type	Command	Response
Setting command	AT+CGCONTRDP =[<cid>]	+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<source_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_se c_addr>[,<P_CSCF_prim_addr>[,<P_CSCF_sec_addr>[,<IM _CN_Signalling_Flag>]]]]]]] [<CR><LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<source_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_se c_addr>[,<P_CSCF_prim_addr>[,<P_CSCF_sec_addr>[,<IM _CN_Signalling_Flag>]]]]]]] [...]] OK
Query command parameter range	AT+CGCONTRDP =?	+CGCONTRDP: (list of <cid>s associated with active contexts) OK

Parameter

Name	Description	Value
cid	Specifies a particular PDP context definition (see "+CGDCONT, define PDP context").	- -
bearer_id	Identifies the bearer, for example, the EPS bearer in EPS and the NSAPI in UMTS/GPRS.	Type: integer
apn	Access point name.	Type: string
source_addr and subnet_mask	Indicates the IP address and subnet mask of MT.	Type: string The string is given as dot-separated numbers (0 to 255). When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.

Name	Description	Value
gw_addr	Gateway address of MT.	Type: string The string is given as dot-separated numbers (0 to 255). When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.
DNS_prim_addr	Primary DNS address.	Type: string When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.
DNS_sec_addr	Secondary DNS address.	Type: string When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.
P_CSCF_prim_addr	Primary P_CSCF server IP address	Type: string When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.
P_CSCF_sec_addr	Secondary P_CSCF server IP address	Type: string When +CGPIAF is supported, its setting returns the parameter format as an execution of +CGCONTRDP.
IM_CN_Signalling_Flag	Shows whether the PDP context is for IM CN subsystem-related signalling only or not.	Type: string <ul style="list-style-type: none"> • 0: PDP context is not for IM CN subsystem-related signalling only • 1: PDP context is for IM CN subsystem-related signalling only

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	Yes	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CGCONTRDP=?

1

+CGCONTRDP: (1,2)

OK

AT+CGCONTRDP=1**2****+CGCONTRDP:**

```
1,5,"ctnet","10.8.92.142.255.0.0.0","10.8.92.141","202.96.134.33","202.96.128.166",
"0.0.0.0","0.0.0.0"
```

+CGCONTRDP:

```
1,5,"ctnet","36.14.4.125.50.216.244.114.0.1.0.2.80.220.163.199.255.255.255.255.2
55.255.255.0.0.0.0.0.0.0.0.0","254.128.0.0.0.0.0.0.0.0.0.0.0.0.5","36.14.0.31.0.1.0.
0.0.0.0.0.0.0.1","36.14.0.31.0.1.0.0.0.0.0.0.0.0.0.0.51","0.0.0.0.0.0.0.0.0.0.0.0.
0.0.0","0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0"
```

OK

① Query the value range of PDP context dynamic parameters.

② Set PDP context dynamic parameters.

8.11 +GTSTATIS, query current rate and total data volume

Description

This command is used to query the current transmitting and receiving rate of the UE and the total number of bytes sent and received during this dialing. When dialing stops, the total number of bytes received and sent is cleared to 0.

Format

Type	Command	Response
Setting command	--	--
Read current settings	AT+GTSTATIS?	+GTSTATIS: <rx_rate>,<tx_rate>,<rx_bytes>,<tx_bytes> OK
Query command parameter range	AT+GTSTATIS=?	OK

Parameter

Name	Description	Value
rx_rate	Current download rate	Type: integer The unit is byte. Value 0 is returned when not dialed.
tx_rate	Current upload rate	Type: integer The unit is byte. Value 0 is returned when not dialed.
rx_bytes	Total current dial-up download data	Type: integer The unit is byte. Value 0 is returned when not

Name	Description	Value
		dialed.
tx_bytes	Total current dial-up upload data	Type: integer The unit is byte. Value 0 is returned when not dialed.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	Yes	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTSTATIS=? ❶

OK

AT+GTSTATIS? ❷

+GTSTATIS: 0,0,0,0

OK

AT+GTSTATIS? ❸

+GTSTATIS: 0,168,933,5857

OK

❶ Test command

❷ Query when not dialed

❸ Query during data business

9 Audio

9.1 +CLVL, loudspeaker volume level

Description

This command is used to select the volume of the internal loudspeaker of the MT.

In this command, the new value will be retained after a power cycle. The +CLVL command can be used even when the SIM is not inserted.

Format

Type	Command	Response
Set command	AT+CLVL=<level>	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+CLVL?	+CLVL: <level> OK
Query command parameter range	AT+CLVL=?	+CLVL: (list of supported <level>s) OK

Parameter

Name	Description	Value
level	Volume level	Range: 0 to 7 <ul style="list-style-type: none"> 0: Low volume level (non-muting) 4: Default value

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CLVL=3      ❶
OK
AT+CLVL?      ❷
+CLVL: 3

```

OK

AT+CLVL=?

③

+CLVL: (0-7)

OK

- ① Set the volume level
- ② Query volume level
- ③ Query command format

9.2 +CMUT, mute control

Description

This command is used to enable and disable the uplink voice muting during a voice call. The CMUT setting should take effect only for the current call or for the next call once the command setting was typed in idle mode.

Format

Type	Command	Response
Set command	AT+CMUT=<state>	Response 1: OK
		Response 2: +CME ERROR: <err>
Read current settings	AT+CMUT?	+CMUT: <state> OK
Query command parameter range	AT+CMUT=?	+CMUT: (list of supported <state>s) OK

Parameter

Name	Description	Value
state	Mute state	0: Unmute the microphone and speaker path (default value). 1: The microphone path is muted, and the speaker path is unmuted. 2: The microphone and the speaker paths are muted. 3: The microphone speaker paths are muted.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CMUT=3 ❶
OK
AT+CMUT? ❷
+CMUT: 3

OK
AT+CMUT=? ❸
+CMUT: (0-3)

OK
```

- ❶ Mute microphone and speaker
- ❷ Query the mute path
- ❸ Query command format

9.3 +VTD, tone duration

Description

This command is used to select the tone duration. An integer <n> defines the length of tones emitted as a result of the +VTS command.

In GSM, the audio duration value can be modified according to a specific network.

In GSM/UMTS, the value of audio duration is preset and cannot be changed. For details, refer to 27.007-e50 in 3GPP protocol.

Format

Type	Command	Response
Set command	AT+VTD=<n>	Response 1: OK
		Response 2: +CME ERROR: <err>
Read current settings	AT+VTD?	+VTD: <n> OK
Query command parameter range	AT+VTD=?	+VTD: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Defines the length of the tone issued by the +VTS command.	Range: 1 to 10 1 to 10: 100ms to 1s adjustable

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+VTD=3           ❶
OK
AT+VTD?           ❷
+VTD: 3

OK
AT+VTD=?          ❸
+VTD: (1-10)

OK

```

❶ Setting

❷ Query

❸ Query command format

9.4 +VTS, DTMF and tone generation

Description

This command allows the transmission of DTMF (Dual Tone Multiple Frequency) tones when a voice call is active. For example, DTMF tones may be used when announcing the start of a recording period. The duration does not erase the VTD duration.

In GSM, the audio duration value can be modified according to a specific network.

If an active call is interrupted during the playback of a DTMF tone, the message +VTS: "Call termination stopped DTMF tone transmission" will be transmitted to TE.

The duration defined by +VTS is specific to the DTMF string in this command only. It does not erase the duration defined by the +VTD command, and is erased when the module is powered down. If <duration> is not defined, the +VTD value is used.

Format

Type	Command	Response
Set command	AT+VTS=<DTMF>[,<duration>]	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+VTS?	- -
Query command parameter range	AT+VTS=?	+VTS: (list of supported <DTMF>s),(list of supported <duration>s) OK

Parameter

Name	Description	Value
DTMF	ASCII string	Type: string Range: 0 to 9, #, *, A to D Length: maximum of 32 characters
duration	The duration of the DTMF tone is different from the duration set by the +VTD command. If not set, the module will use the value in VTD.	Range: 1 to 10 100ms to 1s adjustable

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+VTS="123",3

①

OK

AT+VTS=?

②

+VTS: (0-9, #, *, A-D), (1-10)

OK

① Setting

② Query command format

9.5 +GTDTMF, software decode

Description

This command is used to enable or disable DTMF software decoding. If a DTMF tone is detected in the voice mode, the module will return an unsolicited result code + GTDTMF: <x>.

Format

Type	Command	Response
Set command	AT+GTDTMF=<n>	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+GTDTMF?	+GTDTMF: <n> OK
Query command parameter range	AT+GTDTMF=?	+GTDTMF: (0,1) OK

Parameter

Name	Description	Value
n	Status	<ul style="list-style-type: none"> 0: Disable DTMF decoding (default value) 1: Enable DTMF decoding unsolicited result code +GTDTMF

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+GTDTMF=1      ❶
OK
AT+GTDTMF?      ❷
+GTDTMF: 1
OK
AT+GTDTMF=?     ❸
+GTDTMF: (0,1)

```

OK

- ① Setting
- ② Query
- ③ Query command format

9.6 +MAPATH, audio path

Description

This command sets or requests the active input and output for each function. When powering on, the default path, microphone, speaker and alarm speaker will be restored.

Format

Type	Command	Response
Set command	AT+MAPATH=<direct>,<accy>	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+MAPATH?	Response : +MAPATH: < direct >,< accy > OK
Query command parameter range	AT+MAPATH=?	+MAPATH: (list of supported <direct>s),(list of supported <accy>s) OK

Parameter

Name	Description	Value
direct	Input and output status	1: Default value
accy	Audio channel output module	1: Default value

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MAPATH=1,1

①

OK

AT+MAPATH?

2

+MAPATH: 1,1

OK

AT+MAPATH=?

3

+MAPATH: (1),(1)

OK

1 Setting

2 Query

3 Query command format

9.7 +MAVOL, set volume level

Description

This command allows the volume of a specific function to be determined based on a specific accessory. The gain level is saved in the NVM for power failure saving.

Format

Type	Command	Response
Set command	AT+MAVOL=<accy>,<feature>,<vol>	Response 1: OK
		Response 2: +CME ERROR: <err>
Read current settings	AT+MAVOL?	(Set current path) +MAVOL: <accy>,<feature>,<vol> OK
Query command parameter range	AT+MAVOL=?	+MAVOL: (list of supported <accy>s),(list of supported <feature>s),(list of supported <vol>s) OK

Parameter

Name	Description	Value
accy	Output selection	1: SPK+/SPK-
feature	Adjustment category	1: Voice
vol	Volume level	Range: 0 to 7 4: Default value

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MAVOL=1,1,7 ❶
OK

AT+MAVOL? ❷
+MAVOL: 1,1,7

OK
AT+MAVOL=? ❸
+MAVOL: (1),(1),(0-7)

OK

- ❶ Set the volume level
- ❷ Query volume level
- ❸ Query command format

9.8 +MMICG, select microphone gain value

Description

This command is used to select the microphone gain value of MIC.

Format

Type	Command	Response
Set command	AT+MMICG=<gain>	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+MMICG?	+MMICG: <gain> OK
Query command parameter range	AT+MMICG=?	+MMICG: (list of supported <gain>s) OK

Parameter

Name	Description	Value
gain	Microphone gain value	Range: 0 to 15 0: the lowest gain value (non-muting). The default value is 10.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+MMICG=3 ❶

OK

AT+MMICG? ❷

+MMICG: 3

OK

AT+MMICG=? ❸

+MMICG: (0-15)

OK

- ❶ Set the volume level
- ❷ Query volume level
- ❸ Query command format

10 System Time

10.1 +CCLK, read or set system date and time

Description

This command is used to read or set the module current date, time and zone.

Format

Type	Command	Response
Setting command	AT+CCLK=<time>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CCLK?	Response 1: +CCLK: <time>
		OK
		Response 2: ERROR
Query command parameter range	AT+CCLK=?	OK

Parameter

Name	Description	Value
time	Current date, time and zone of the module	Type: string <ul style="list-style-type: none">• yy/MM/dd,hh:mm:ss±zz• yy: 2-digit year [00-99]• MM: 2-digit month [01-12]• dd: 2-digit day of month [01-31]• hh: 2-digit hour [00-23]• mm: 2-digit minute [00-59]• ss: 2-digit seconds [00-59]• zz: (optional) time zone offset from GMT, in quarter-hours [-96...+96] If this value is not specified, the time zone offset will be 0.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CCLK?

+CCLK: "24/04/02,18:58:10+32"

❶

OK

AT+CCLK=?

❷

OK

AT+CCLK="19/09/14,00:30:19+32"

❸

OK

❶ Read system time settings.

❷ Query command parameter range.

❸ Set system time and date.

10.2 +CTZU, automatically update time zone

Description

This command enables or disables (on/off) the automatic update of the time zone through NITZ.

Format

Type	Command	Response
Setting command	AT+CTZU=<onff>	Response 1: OK Response 2: ERROR
Read current settings	AT+CTZU?	+CTZU: <onff> OK
Query command parameter range	AT+CTZU=?	+CTZU: (0,1) OK

Parameter

Name	Description	Value
onff	Indicates the NITZ function	Type: integer • 0: Turn off automatic time zone update

Name	Description	Value
		through NITZ (default value)
		<ul style="list-style-type: none"> 1: Turn on automatic time zone update through NITZ
Characteristic		
Require SIM Card Normal	No	Require Network Registration No
Require Data Connection	No	Async or Sync Command Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms) 1000

Example**AT+CTZU?** ①

+CTZU: 0

OK

AT+CTZU =? ②

+CTZU: (0,1)

OK

AT+CTZU=1 ③

OK

- ① Read current settings.
- ② Query command parameter range.
- ③ Set to turn on automatic time zone update through NITZ.

10.3 +CTZR, time zone reporting

Description

This command enables or disables time zone change events and daylight saving time reporting. If reporting function is enabled, MT will return unsolicited result +CTZV: <tz> or +CTZE: <tz>, <dst>, [<time>].

Format

Type	Command	Response
Setting command	AT+CTZR=[<reporting>]	Response 1: OK
		Response 2:

Type	Command	Response
		ERROR
Read current settings	AT+CTZR?	+CTZR: <reporting> OK
Query command parameter range	AT+CTZR=?	+CTZR: (list of supported <reporting>s) OK

Parameter

Name	Description	Value
reporting	Value of time zone change event reporting	Type: integer <ul style="list-style-type: none"> 0: Disable time zone change event reporting (default) 1: Enable time zone change event reporting through unsolicited result +CTZV: <tz> 2: Enable extended time zone and local time reporting with unsolicited result +CTZE: <tz>, <dst>, [<time>]
tz	An integer value indicating the time zone	- -
time	Current time	Type: string Format: "yy/MM/dd,hh:mm:ss" Where characters represent year, month, day, hour, minute, and second.
dst	Daylight saving time	Type: integer <ul style="list-style-type: none"> 0: No adjustment for daylight saving time 1: +1 hour adjustment for daylight saving time 2: +2 hours adjustment for daylight saving time

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CTZR?

1

+CTZR: 0

OK

AT+CTZR=? ②

+CTZR: (0-2)

OK

AT+CTZR=1 ③

OK

- ① Read current settings.
- ② Query command parameter range.
- ③ Set to enable time zone change event reporting OK.

11 Hardware

11.1 +IPR, fixed DTE rate

Description

This command specifies the data rate at which the DCE will accept commands. The full range of data rate values may be reduced dependent on hardware or other criteria.

Format

Type	Command	Response
Setting command	AT+IPR=<baud_rate>	Response 1: OK Response 2: ERROR
Read current settings	AT+IPR?	+IPR: <baud_rate> OK
Query command parameter range	AT+IPR=?	+IPR: (list of supported <baud_rate>s) OK

Parameter

Name	Description	Value
baud_rate	Baud rate value	Values: 0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1000000, 2000000,3000000,4000000 Default is 0(19200,38400,57600,115200) Note: When the uart baud rate is adaptive at startup, AT command ready can only be received at 115200. Adaptive baud rate base is 115200.

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+IPR=115200      ❶
OK
AT+IPR?            ❷
+IPR: 115200

OK
AT+IPR=?          ❸
+IPR:
(0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1000000
,2000000,3000000,4000000)

OK

```

- ❶ Set the baud rate to 115200.
- ❷ Query the current baud rate.
- ❸ Query available parameters.

11.2 +CBAUD, baud rate regulation

Description

This command sets the UART baud rate. The baud rate of the module will be change or set to the request value <rate>.

Format

Type	Command	Response
Setting command	AT+CBAUD=<n>	Response 1: OK Response 2: ERROR
Read current settings	AT+CBAUD?	+CBAUD: <rate> OK
Query command parameter range	AT+CBAUD=?	+CBAUD: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Baud rate mode selection	Type: integer <ul style="list-style-type: none"> 0: automatic baud rate 1: 300 2: 600

Name	Description	Value
		<ul style="list-style-type: none"> • 3: 1200 • 4: 2400 • 5: 4800 • 6: 9600
n	Baud rate mode selection	Type: integer <ul style="list-style-type: none"> • 7: 19200 • 8: 38400 • 9: 57600 • 10: 115200 • 11: 230400 • 12: 460800 • 13: 921600 • 14: 1000000 • 15: 2000000 • 16: 3000000 • 17: 4000000 <p>The supported baud rate and default baud rate depends on the target, and 0 is recommended as the default setting.</p> <p>Note: When the uart baud rate is adaptive at startup, AT command ready can only be received at 115200. Adaptive baud rate base is 115200.</p>
rate	Baud rate value	Type: integer Value: 0, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600, 1000000, 2000000, 3000000, 4000000

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CBAUD=10      ❶
OK
AT+CBAUD?       ❷

```

```
+CBAUD: 115200
```

```
OK
```

```
AT+CBAUD=?
```

3

```
+CBAUD: (0-17)
```

```
OK
```

- 1 Set the UART baud rate to 115200.
- 2 Query the current UART baud rate.
- 3 Query available parameters.

11.3 &K, RTS/CTS flow control

Description

This command configures the hardware flow control.

Format

Type	Command	Response
Setting command	AT&K<param>	Response 1: OK
		Response 2: ERROR
Read current settings	AT&K?	&K: <param> OK
Query command parameter range	AT&K=?	&K: (list of supported <param>s) OK

Parameter

Name	Description	Value
param	Terminal control switch	Type: integer <ul style="list-style-type: none"> 0: turn off control for all terminals (default value) 3: start the CTS/RTS flow control function of terminals

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take	No	Require Data Store at Power Down	No

Effect

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

AT&K3 ①

OK

AT&K? ②

&K: 3

OK

AT&K=? ③

&K: (0,3)

OK

① Start the CTS/RTS flow control function of terminals.

② Query current terminal status.

③ Query available parameters.

11.4 +IFC, RTS/CTS flow control

Description

This parameter controls the operation of the local flow control between the terminal and the module during the data state when V.42 error control is used, or when fallback to non-error control mode is specified to include buffering and flow control.

Format

Type	Command	Response
Setting command	AT+IFC =[<DCE_by_DTE>[,<DTE_by_DCE>]]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+IFC?	+IFC: [<DCE_by_DTE>[,<DTE_by_DCE>]] OK
Query command parameter range	AT+IFC =?	+ IFC: (list of supported <DCE_by_DTE>s, list of supported <DTE_by_DCE>s) OK

Parameter

Name	Description	Value
DCE_by_DTE	Specifies the method to be used by the terminal to control the flow of received data from the module.	Type: integer <ul style="list-style-type: none"> • 0: none(default value) • 2: circuit 133 (ready for receiving)
DTE_by_DCE	Specifies the method to be used by the module to control the flow of transmitted data from the terminal.	Type: integer <ul style="list-style-type: none"> • 0: none(default value) • 2: circuit 106 (clear to send/ready for sending)

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+IFC=? ①

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

OK

AT+IFC=2,2 ②

OK

AT+IFC? ③

+IFC: 2,2

OK

① Query available parameters and ranges.

② Set control mode.

③ Confirm current status.

11.5 +ICF, DTE-DCE character frame definition

Description

This command is used to set the character frame parameters of serial communication: data bit, stop bit and parity bit.

Format

Type	Command	Response
Setting command	AT+ICF=[<format>[,<parity>]]	Response 1: OK Response 2: +CME ERROR: <err>
Read current settings	AT+ICF?	Response 1: +ICF: <format>,<parity> OK Response 2: +CME ERROR: <err>
Query command parameter range	AT+ICF=?	+ICF: (list of supported <format> values),(list of supported <parity> values) OK

Parameter

Name	Description	Value
format	Basic format for character frame parameters	1: 8 data bits, 2 stop bits, no parity bit 2: 8 data bits, 1 stop bits, 1 parity bit 3: 8 data bits, 1 stop bits, no parity bit(default value) 4: 7 data bits, 2 stop bits, no parity bit 5: 7 data bits, 1 stop bits, 1 parity bit 6: 7 data bits, 1 stop bits, no parity bit Detailed reference: ITU-T Rec. V.250
parity	Parity bit definition	0: Odd parity 1: Even parity 4: No parity(default value) Detailed reference: ITU-T Rec. V.250

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+ICF?

+ICF: 3,4

OK

AT+ICF=?

+ICF: (0-6),(0,1,4)

OK

AT+ICF=5,1

OK

11.6 +WRIM, RI signal width setting

Description

This command is used to set the duration of RI pulse with low voltage when the module receives a short message or call or data.



If there are no incoming short messages or calls or data, the RI pin will remain high.

Format

Type	Command	Response
Setting command	AT+WRIM=<type>,<duration>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+WRIM?	Response 1: +WRIM: <type>,<duration> OK
		Response 2: ERROR
Query command parameter range	AT+WRIM =?	Response 1: +WRIM: (list of supported <type>s),(list of supported <duration>s) OK
		Response 2: ERROR

Parameter

Name	Description	Value
type	Type value	Type: integer <ul style="list-style-type: none"> • 0: take effect on voice call • 1: take effect on SMS • 2: take effect on TCP/IP Data
duration	Duration	Type: integer 0: means default setting: < type>,<duration> as (0,1000) and (1,150) and (2,0) 1-2000 : 1-2000ms

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+WRIM? 1
+WRIM: 0,1000
+WRIM: 1,150
+WRIM: 2,0

OK
AT+WRIM=? 2
+WRIM: (0-2),(0-2000)

OK
AT+wrim=1,200 3

OK

```

- 1 Read RI signal width settings.
- 2 Query command parameter range.
- 3 Set the signal width of RI signal.

11.7 +GPIO, set and read GPIO

Description

This command is used to configure supported GPIO pins and gets value from input pin.

Format

Type	Command	Response
Setting command	AT+GPIO=<pin>,<direct>[,<value>]	Response 1: When <direct> is 0 or 1: OK
		Response 2: When <direct> is 2: <value> is omitted +GPIO: value OK
		Response 3: ERROR
Read current settings	AT+GPIO?	OK
Query command parameter range	AT+GPIO=?	Response 1: +GPIO: <pin>,<direct>,<value> OK
		Response 2: ERROR

Parameter

Name	Description	Value
pin	Indicates the pin	Type: integer Use AT+GPIO=? Know about the supported pin before setting pin value.
direct	- -	Type: integer <ul style="list-style-type: none"> • 0: input • 1: output • 2: query output value of the single pin
value	High level	Type: integer <ul style="list-style-type: none"> • 0: low level • 1: high level

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example**AT+GPIO?**

❶

+GPIO: 0,0 and 1

OK

AT+GPIO=?

❷

+GPIO: (0-10),(0-2)[,(0-1)]

OK

AT+GPIO=1,1,1

❸

OK

❶ Read pin settings.

❷ Query command parameter range.

❸ Set this pin to output high.

11.8 +CBC, battery charger connection

Description

This command intends to query the battery voltage level.

Format

Type	Command	Response
Read current settings	AT+CBC	+CBC: <bcs>,<bcl> OK

Parameter

Name	Description	Value
bcs	--	Type: integer 0: MT is powered by the battery (default value).
bcl	--	Type: integer Voltage unit: mV

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example**AT+CBC****①****+CBC: 0,3944**

OK

① Read pin settings.

11.9 +MMAD, query ADC channel voltage value

Description

This command queries the current channel voltage value of the requested ADC in millivolts (mV).

Format

Type	Command	Response
Setting command	AT+MMAD	Response 1: +MMAD: <channel>,<value> OK
		Response 2: ERROR
Read current settings	AT+MMAD?	Response 1: +MMAD: <channel>,<value> OK
		Response 2: ERROR

Parameter

Name	Description	Value
channel	ADC channel number. There are usually two channels.	Range: 0–1 (The range varies depending on platforms.) Unsigned type, decimal number
value	Voltage value detected in millivolts (mV)	Range: 0–2000 (The maximum value varies depending on platforms.) Unsigned type, decimal number

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

AT+MMAD

+MMAD: 0,500 ^①

+MMAD: 1,375 ^②

OK

① Represents the 0 channel voltage value of 500mV

② Represents the 1 channel voltage value of 375mV

11.10 +MTSM, temperature sensor measurement

Description

This command measures the current temperature sensor value in Celsius degrees. The temperature is taken from a thermistor internally.



When the module restarts and the default value is 0, all parameters restore to their default values.

Format

Type	Command	Response
Setting command	AT+MTSM=<Report>[,<Rate>][,<Low>,<High>]	<p>Response 1:</p> <p>If <Report>=0</p> <p>OK</p> <p>If <Report>=8</p> <p>+MTSM: "</p> <p><sensor name>:<Temp></p> <p><sensor name>:<Temp></p> <p>...</p> <p>"</p> <p>OK</p> <p>If <Report>=1, 6, or 7</p> <p>+MTSM: <Temp></p> <p>OK</p> <p>If <Report>=2 or 3</p> <p>OK</p> <p>Response 2:</p> <p>+MTSM: <Temp></p> <p>...</p>

Type	Command	Response
		+MTSM: <Temp>
		Response 3: ERROR
Read current settings	AT+MTSM?	+MTSM: <Report>[,<Rate>][,<Low>,<High>] OK
Query command parameter range	AT+MTSM=?	+MTSM: (range <Report>),(range <Rate>),(range <Low>/<High>) OK

Parameter

Name	Description	Value
Report	Value indicates report type	Type: integer <ul style="list-style-type: none"> • 0: deactivate unknown reports (default value) • 1: report the current temperature once • 2: activate unsolicited reports • 3: activate unsolicited reports only for out-of-border events • 6: report temperature of BBIC • 7: report RF temperature • 8: Report the temperature of all sensors once.
Rate	Select the time interval between unsolicited reports	Type: integer Range: 1 to 255 Unit: second Default value: 1
Low	Minimum boundary level for temperature values in unsolicited reports	Type: integer Range: 0 to 125 Default value: 0
High	Maximum boundary level for temperature values in unsolicited reports	Type: integer Range: 0 to 125 Default value: 0
Temp	Temperature value of current sensor	Type: integer

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
-------------------------	----	------------------------------	----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+MTSM? 1
+MTSM: 0

OK

AT+MTSM=? 2
+MTSM: (0-3,6-7),(1-255),(0-125),(0-125)

OK

AT+MTSM =1 3
+MTSM: 32

OK

AT+MTSM =8 4
+MTSM: "
Main:28
DSP:27
IPA:27
CPU:27
Modem:26
XO:24
PA:24
"

OK

AT+MTSM? 5
+MTSM: 8

OK

```

- 1 Read current temperature sensor settings.
- 2 Query command parameter range.
- 3 Set to report the current temperature once.

- ④ Set to report the temperature of all sensors once.
- ⑤ Read current temperature sensor settings.

11.11 +GTFMODE, enable hardware flight mode

Description

This command enables the hardware to switch to flight mode. When AT+GTFMODE=1, the hardware pin operates (whether to enter the flight mode), and the pin is pulled low to enter the flight mode; when AT+GTFMODE =0, the hardware pin operation is invalid.



Refer to the appropriate product hardware manual for the pins that control the flight mode.

Format

Type	Command	Response
Setting command	AT+GTFMODE=<n>	Response 1: OK
		Response 2: ERROR
	AT+GTFMODE?	+GTFMODE:<n> OK
Read current settings	AT+GTFMODE=?	+GTFMODE: (list of supported <n>s) OK

Parameter

Name	Description	Value
n	Enable or disable hardware flight mode	Type: integer <ul style="list-style-type: none"> • 0: invalid hardware pin operation (default value) • 1: valid hardware pin operation

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTFMODE?**+GTFMODE:0**

OK

AT+GTFMODE=1

OK

AT+GTFMODE?**+GTFMODE:1**

OK

11.12 +GTUSBMODE, set USB profile

Description

This command changes the USB profile of the module. There are two main profiles: AT+NCM profile for legacy AT command and MBIM profile for Windows 8.1 or Windows 10 supporting. The new profile is activated after a reset or power cycle.

Format

Type	Command	Response
Setting command	AT+GTUSBMODE=<mode>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTUSBMODE?	+GTUSBMODE: <mode> OK
Query command parameter range	AT+GTUSBMODE=?	+GTUSBMODE: (list of supported <mode>s) OK

Parameter

Name	Description	Value
mode	USB function mode	Type: integer 20: Modem 21: Modem+AT 22: Modem+AT+RMNET

Name	Description	Value
		23: Modem+AT+ECM
		24: RNDIS+Modem+Diag+ADB
		29: MBIM+AT+DIAG
		30: MBIM+MODEM+DIAG+AT
		36: RMNET+DIAG+AT+Pipe(default value)
		37: RMNET+DIAG+AT+Pipe+ADB
		38: ECM+DIAG+AT+Pipe
		39: ECM+DIAG+AT+Pipe+ADB
		40: RNDIS+DIAG+AT+Pipe
		41: RNDIS+DIAG+AT+Pipe+ADB
		42: MBIM+Pipe+DIAG+AT
		43: MBIM+Pipe+DIAG+AT+ADB
		47: RMNET+DIAG+AT+Pipe+DPL
		48: ECM+DIAG+AT+Pipe+DPL
		49: MBIM+Pipe+DIAG+AT+DPL

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Async command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	5000	Max Result Returning Duration (ms)	5000

Example

```

AT+GTUSBMODE=? 1
+GTUSBMODE: (20-24,29-30,36-43,47-49)
OK
AT+GTUSBMODE=37 2
OK
AT+CFUN=15 3
OK
AT+GTUSBMODE? 4
+GTUSBMODE: 37
OK

```

- 1 Query available parameters and ranges.
- 2 Enable ADB mode.
- 3 Reboot module.
- 4 Confirm current USB configuration mode

11.13 +GTLPGEN, enable/disable LPG

Description

This command is used to enable or disable the LPG function, and which is enabled by default.

Format

Type	Command	Response
Setting command	AT+GTLPGEN=<lpg_en>	Response 1: OK Response 2: ERROR
Read current settings	AT+GTLPGEN?	+GTLPGEN: <lpg_en> OK
Query command parameter range	AT+GTLPGEN=?	+GTLPGEN: (list of supported <lpg_en>s) OK

Parameter

Name	Description	Value
lpg_en	LPG enable switch	Type: integer 0: disable the LPG function 1: enable the LPG function(default value)

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTLPGEN=1

OK

AT+GTLPGEN?

++GTLPGEN: 1

OK

AT+GTLPGEN=?

+GTLPGEN: (0,1)

OK

12 Telephone Book

12.1 +CNUM, request MSISDN(s)

Description

This command displays up to 2 strings of text information that identify the module. The output string contains double quotes. On SIM cards that have EFmsisdn file, the string(s) returned are the MSISDN numbers and their associated data. On SIM cards that don't have EFmsisdn file, the strings returned are the MSISDN numbers and their associated data stored in Modem NVM.

Format

Type	Command	Response
Query command	AT+CNUM	+CNUM: [<alpha1>,<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>,<number2>,<type2>[,<speed>,<service>[,<itc>]] [...]] OK
Read current International Mobile Subscriber Identity number	AT+CNUM?	+CNUM: [<alpha1>,<number1>,<type1>[,<speed>,<service>[,<itc>]] [<CR><LF>+CNUM: [<alpha2>,<number2>,<type2>[,<speed>,<service>[,<itc>]] [...]] OK
Query command parameter range	AT+CNUM=?	OK

Parameter

Name	Description	Value
alpha _x	Optional alphanumeric string associated with <number _x >	Type: string The used character set should be the one selected with command AT+CSCS.
number _x	Phone number of format specified by <typex>	Type: string String of 11-digit numbers, for example: 19912351011.
typex	Domestic or international	Type: integer <ul style="list-style-type: none"> 129: ISDN/telephony numbering plan, national/international unknown 145: ISDN/telephony

Name	Description	Value
		numbering plan, international number • 161: ISDN/telephony numbering plan, national number
speed	Baud rate Same as <speed> defined in CBST commands.	Type: integer For details, see the description in CBST.
service	Service related to the phone number	Type: integer • 0: asynchronous modem • 1: synchronous modem • 2: PAD access (asynchronous) • 3: packet access (synchronous) • 4: voice • 5: fax
itc	Information transfer capability	Type: integer • 0: 3,1 kHz • 1: UDI

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CNUM ①
 +CNUM: , "15478212457", 129

OK

AT+CNUM? ②
 +CNUM: , "15478212457", 129

OK

AT+CNUM=? ③
 OK

① Query MSISDN(s) number.

- ② Query MSISDN(s) number.
- ③ Query command parameter range.

13 Access and Security

13.1 +CPIN, enter PIN

Description

If the terminal has previously set (SIM PIN, SIM PUK, and PH SIM PIN), it is necessary to send the unlocking code to the terminal. If the PIN code is entered twice, the PIN will not change. If no PIN code has been set, +CME ERROR is returned when unlocking.



SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM PUK2 refer to the PIN of the selected application on the UICC.

For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM.

Format

Type	Command	Response
Setting command	AT+CPIN=<pin>[,<newpin>]]	Response 1: OK
		Response 2: ERROR
Read current settings	AT+CPIN?	Response 1: +CPIN: <code> OK
		Response 2: ERROR
Query command parameter range	AT+CPIN=?	OK

Parameter

Name	Description	Value
pin, newpin	PIN	Type: string
code	Type of PIN	<ul style="list-style-type: none">• READY: MT is not pending for any password.• SIM PIN: MT is waiting SIM PIN to be given.• SIM PUK: MT is waiting SIM PUK to be given.• PH-SIM PIN: MT is waiting phone-to-SIM card password

Name	Description	Value
		to be given.
		<ul style="list-style-type: none"> • PH-FSIM PIN: MT is waiting phone-to-very first SIM card password to be given. • PH-FSIM PUK: MT is waiting phone-to-very first SIM card unblocking password to be given. • SIM PIN2: MT is waiting SIM PIN2 to be given. If PIN2 is not entered right, for example, +CME ERROR: 17 is returned, it is recommended that MT does not block its operation. • SIM PUK2: MT is waiting SIM PUK2 to be given. If PUK2 is not entered right, for example, +CME ERROR: 18 is returned, it is recommended that MT does not block its operation. • PH-NET PIN: MT is waiting network personalization password to be given. • PH-NET PUK: MT is waiting network personalization unblocking password to be given. • PH-NETSUB PIN: MT is waiting network subset personalization password to be given. • PH-NETSUB PUK: MT is waiting network subset personalization unblocking password to be given. • PH-SP PIN: MT is waiting service provider personalization password to be given. • PH-SP PUK: MT is waiting service provider personalization unblocking password to be given. • PH-CORP PIN: MT is waiting corporate personalization password to be given. • PH-CORP PUK: MT is waiting corporate personalization unblocking password to be given.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+CPIN="1111"

①

OK

AT+CPIN?

②

```
+CPIN: READY
```

```
OK
```

```
AT+CPIN=?
```

```
3
```

```
OK
```

- ① Setting command.
- ② Read current settings.
- ③ Query command parameter range.

13.2 +TPIN, query number of remaining SIM PIN/PUK entering attempts

Description

This command returns the number of remaining attempts to enter the PIN and PUK of the SIM card being used. The command returns the number of remaining attempts for PIN1 (CHV1), PIN2 (CHV2), PUK1 (unlock CHV1), and PUK2 (unlock CHV2). The number of available attempts depends on the vendor. Typically 3 PIN attempts and 10 PUK attempts. This command will return an error if the SIM is not inserted.

Format

Type	Command	Response
Read current settings	AT+TPIN?	Response 1: +TPIN: <chv1>,<unb1_chv1>,<chv2>,<unb1_chv2> OK Response 2: ERROR

Parameter

Name	Description	Value
chv1	Number of remaining PIN attempts	Type: integer
chv2	Number of remaining PIN2 attempts	Type: integer
unb1_chv1	Number of remaining PUK attempts	Type: integer
unb1_chv2	Number of remaining PIN2 attempts	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command

Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+TPIN? ①
+TPIN: 2,10 and 3,10

OK

```

① Setting command.

13.3 +CPWD, change password

Description

This command sets a new password for the facility lock. The password can only be changed once the required facility is enabled by the +CLCK command. A password can be changed only if the provided password <oldpwd> has been verified.

The entered password <oldpwd> must also comply to the password rules. The facility value <fac> is not case-sensitive. In the password value, letters are not allowed.

Format

Type	Command	Response
Setting command	AT+CPWD=<fac>,<oldpwd>,<newpwd>	Response 1: OK
		Response 2: ERROR
Query current parameter range of the command	AT+CPWD=?	Response 1: +CPWD: list of supported (<fac>,<pwdlength>)s OK
		Response 2: ERROR

Parameter

Name	Description	Value
fac	- -	Type: string <ul style="list-style-type: none"> “SC”: SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power up and when this lock

Name	Description	Value
		command issued) <ul style="list-style-type: none"> • "AO": BAOC (Barr All Outgoing Calls) (see 3GPP TS 22.088 [6] clause 1) • "OI": BOIC (Barr Outgoing International Calls) (see 3GPP TS 22.088 [6] clause 1) • "OX": BOIC exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 clause 1)
fac	- -	Type: string <ul style="list-style-type: none"> • "AI": BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 [6] clause 2) • "IR": BIC Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 clause 2) • "AB": All Barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0) • "AG": All outGoing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0) • "AC": All inComing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0) • "P2": SIM PIN2
oldpwd	The password should be same as the password set by the user, or use the +CPWD command to change the password.	Type: string
newpwd	The password should be same as the password set by the user, or use the +CPWD command to change the password. The maximum length of the password can be set through <pwdlength>.	Type: string
pwdlength	Maximum length of the password	Type: integer

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take	No	Require Data Store at Power Down	No

Effect

Max Response Duration (ms) 1000

Max Result Returning Duration (ms) 1000

Example

AT+CPWD="SC","1111" , "2222"

❶

OK

AT+CPWD=?

❷

+CPWD:

("AB", 4) , ("AC", 4) , ("AG", 4) , ("AI", 4) , ("AO", 4) , ("IR", 4) , ("OI", 4) , ("OX", 4) , ("SC", 8) , ("P2", 8)

OK

❶ Setting command.

❷ Query command parameter range.

13.4 +CLCK, facility lock

Description

This command locks, unlocks or interrogates a module or a network facility <fac> (any kind of call barring program).

A password is required for lock and unlock operations, but is not required for querying. When querying the status of a single call barring program <mode>=2, the <status> for each call type will be returned.

Format

Type	Command	Response
Setting command	AT+CLCK=<fac>,<mode>[,<passwd>[,<classx>]]	Response 1: ERROR Response 2: When <mode>=2 and command is successfully executed: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]] OK
Query command parameter range	AT+CLCK=?	+CLCK: (list of supported <fac>s) OK

Parameter

Name	Description	Value
fac	--	Type: string <ul style="list-style-type: none"> "SC": Lock the SIM card. When the SIM card is locked, the password will be asked when starting

Name	Description	Value
		up. <ul style="list-style-type: none"> • "AO": BAOC (Barr All Outgoing Calls) (see 3GPP TS 22.088 [6] clause 1) • "OI": BOIC (Barr Outgoing International Calls) (see 3GPP TS 22.088 [6] clause 1)
fac	--	Type: string <ul style="list-style-type: none"> • "OX": BOIC exHC (Barr Outgoing International Calls except to Home Country) (see 3GPP TS 22.088 clause 1) • "AI": BAIC (Barr All Incoming Calls) (see 3GPP TS 22.088 [6] clause 2) • "IR": BIC Roam (Barr Incoming Calls when Roaming outside the home country) (see 3GPP TS 22.088 clause 2) • "AB": All Barring services (see 3GPP TS 22.030 [19]) (applicable only for <mode>=0)
fac	--	Type: string <ul style="list-style-type: none"> • "AG": All outGoing barring services (see 3GPP TS 22.030 [19]) (applicable only for <mode>=0) • "AC": All inComing barring services (see 3GPP TS 22.030 [19]) (applicable only for <mode>=0) • "PF": Lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PHFSIM) (MT asks password when other than the first SIM/UICC card is inserted)
fac	--	Type: string <ul style="list-style-type: none"> • "FD": SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>) • "PN": Network Personalization (see 3GPP TS 22.022 [33]) • "PU": network sUbsset Personalization (see 3GPP TS 22.022 [33]) • "PP": service Provider Personalization (see 3GPP TS 22.022 [33]) • "PC": Corporate Personalization (see 3GPP TS 22.022 [33])
mode	Unlocked or not	Type: integer <ul style="list-style-type: none"> • 0: unlock • 1: lock

Name	Description	Value
		<ul style="list-style-type: none"> • 2: query status
status	Activate or not	Type: integer <ul style="list-style-type: none"> • 0: not activated • 1: activated
passwd	Must be the same as the facility password specified in the MT user interface, or use the command to change the password	Type: string
classx	Indicates a sum of integers each representing a class of information (the default value is 7: voice, data and fax)	Type: integer <ul style="list-style-type: none"> • 1: voice • 2: data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128) • 4: fax (facsimile services) • 8: short message service • 16: data circuit synchronization • 32: data circuit asynchronization • 64: dedicated packet access • 128: dedicated PAD access

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CLCK="SC",0,"1111" ①
OK
AT+CLCK=? ②
+CLCK: ("AB","AC","AG","AI","AO","IR","OI","OX","SC","FD","PN","PU","PP","PC","PF")
OK

```

① Setting command.

② Query command parameter range.

13.5 +CPINR, remaining PIN retries

Description

Set this command and MT will return the number of PIN retries remaining +CPINR: <code>,<retries>[,<default_retries>]

Format

Type	Command	Response
Setting command	AT+CPINR[=<sel_code>]	Response 1: +CPINR: <code>,<retries>[,<default_retries>] [<CR><LF>+CPINR: <code>,<retries>[,<default_retries>] [...]] OK Response 2: ERROR
Query command parameter range	AT+CPINR=?	OK

Parameter

Name	Description	Value
retries	Number of remaining retries per PIN	Type: integer
default_retries	Number of default/initial retries per PIN	Type: integer
code	Type of PIN	Type: string All values listed under the description of the AT+CPIN command, <code> parameter, except READY.
ext_code	Extended, manufacturer specific codes	Type: string
sel_code	- -	Type: string These values are strings and shall be indicated within double quotes (""). It is optional to support wildcard match by *, meaning match any (sub-)string.

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
-------------------------	-----	------------------------------	----

Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```

AT+CPINR="SIM"* 1
+CPINR: SIM PIN,<retries>,<default_retries>
+CPINR: SIM PUK,<retries>,<default_retries>
+CPINR: SIM PIN2,<retries>,<default_retries>
+CPINR: SIM PUK2,<retries>,<default_retries>

```

OK

1 Set the number of remaining PIN retries returned by the command.

13.6 +CSIM, general SIM access

Description

This command allows a direct control of the SIM by a distant application on the TE.

Format

Type	Command	Response
Setting command	AT+CSIM=<length>,<command>	Response 1: +CSIM: <length>,<response> OK Response 2: ERROR
Query command parameter range	AT+CSIM=?	OK

Parameter

Name	Description	Value
length	Length of the characters that are sent to TE in <command> or <response>.	Type: integer
Command	Command passed on by the MT to the SIM in the format as described in 3GPP TS 51.011 (hexadecimal character format; refer to the +CSCS command).	Type: string
response	Response to the command passed on by the SIM	Type: string

Name	Description	Value
	to the MT in the format as described in 3GPP TS 51.011 (hexadecimal character format; refer to the +CSCS command).	

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

AT+CSIM= 10,"A020000100" 1

+CSIM: 4,"6E00"

OK

AT+CSIM=? 2

OK

1 Setting command.

2 Query command parameter range.

13.7 +CRSM, restricted SIM access

Description

This command provides limited access to the elementary files on the SIM. Access to the SIM database is restricted to the commands which are listed at <command>. All parameters of AT+CRSM are used as specified by 3GPP TS 51.011 (2G) and TS 31.101 (3G). As response to the command, the module sends the actual SIM information parameters and response data. Error result code +CME ERROR may be returned if the command cannot be transferred to the SIM, for example, if the SIM is not inserted, or defected, or PIN1/PUK authentication required, or required input parameters not present. However, failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Some of the AT+CRSM commands require PIN/PIN2 authentication.

Format

Type	Command	Response
Setting command	AT+CRSM=<command>[,<file_id>[,<P1>,<P2>,<P3>[,<data>[,<pathid>]]]]	Response 1: +CRSM: <sw1>,<sw2>[,<response>] OK

Type	Command	Response
		Response 2: ERROR
Query command parameter range	AT+CRSM=?	OK
Parameter		
Name	Description	Value
Command	Commands are passed on by the MT to the SIM (see 3GPP TS 51.011 [28])	Type: integer <ul style="list-style-type: none"> • 176: READ BINARY • 178: READ RECORD • 192: GET RESPONSE • 214: UPDATE BINARY • 220: UPDATE RECORD • 242: STATUS • 203: RETRIEVE DATA • 219: SET DATA All other values are reserved.
file_id	Identifier of an elementary datafile on SIM. Mandatory for every command except STATUS.	Type: integer The range of valid file identifiers depends on the actual SIM and is defined in the 3GPP TS 51.011 [28], the selected file may not exist.
P1, P2, P3	Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP TS 51.011 [28].	Type: integer
data	Information which shall be written to the SIM (hexadecimal character format; see +CSCS).	Type: string
pathid	Contains the path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (for example, "7F205F70" in SIM and UICC). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60].	Type: string
sw1, sw2	Information from the SIM about the execution of the actual command. For details, see TS102.221.	Type: integer
response	Response of a successful completion of the command previously	Type: string

Name	Description	Value
	issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary data field. This information includes the type of file and its size (refer 3GPP TS 51.011 [28]). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command	

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	2000	Max Result Returning Duration (ms)	2000

Example

```

AT+CRSM=178,28480,1,4,28 1
+CRSM: 144, 0, "FFFFFFFFFFFFFFFFFFFFFFFFF0891688166349308F2FFFFFFFF"

OK
AT+CRSM=? 2
OK

```

1 Setting command.

2 Query command parameter range.

1 Read the status of the 6F7B file.

13.8 +CCHO, open UICC logical channel

Description

This command causes the module to return a <sessionid> allocated by UICC for CRLA and CGLA commands to access the UICC.

Format

Type	Command	Response
Setting command	AT+CCHO=<dfname>	Response 1: <sessionid>

Type	Command	Response
		OK
		Response 2: ERROR
Read current settings	--	--
Query command parameter range	--	--

Parameter

Name	Description	Value
dfname	DF name in UICC, hexadecimal string	Type: string DF has a maximum length of 16 bytes and converted parameters have a maximum length of 32 bytes. The 4 bytes of 0xA0, 0x00, 0x03 and 0xEF need to be converted into a string of 8 bytes of "A00003EF." Detailed reference: 3GPP TS 27.007
sessionid	Session ID allocated by SIM card	Type: integer Detailed reference: 3GPP TS 27.007

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CCHO="A0000000871002FF86FFFF89FFFFFFFF"
```

```
1
```

```
OK
```

13.9 +CCHC, close UICC logical channel

Description

This command closes the previously opened UICC logical channel. The UICC will not be accessed after it is closed.

Format

Type	Command	Response
Setting command	AT+CCHC=<sessionid>	Response 1: +CCHC OK Response 2: ERROR
Read current settings	- -	- -
Query command parameter range	- -	- -

Parameter

Name	Description	Value
sessionid	Session ID previously assigned by SIM card	Type: integer Detailed reference: 3GPP TS 27.007

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CCHC=1
+CCHC
OK
```

13.10 +CGLA, access general UICC logical channel

Description

The command sends the command to the UICC through the previously opened UICC logical channel, and the UICC returns the execution result of the command.

Format

Type	Command	Response
Setting command	AT+CGLA=<sessionid>,<length>,<command>	Response 1: +CGLA: <length>,<response> OK Response 2: ERROR
Read current settings	--	--
Query command parameter range	--	--

Parameter

Name	Description	Value
sessionid	Session ID previously assigned by SIM card	Type: integer Detailed reference: 3GPP TS 27.007
length	Length of sent command or received response	Type: integer The length is twice the actual bytes of the command or response. If that command is two-byte of 0xB0 and 0x3C, the command string is "B03C" and the length is 4.
command	Command string sent to UICC	Type: string String converted from command bytes The 4-byte command of 0xA0, 0x00, 0x03 and 0xEF needs to be converted into a string of 8 bytes of "A00003EF."
response	UICC response	Type: string String converted from response bytes Detailed reference: 3GPP TS 27.007

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+CGLA=1,8," A00003EF"
```

```
+CGLA: 4,"6C20"
```

```
OK
```

14 Data Connection Control

14.1 +GTRNDIS, RNDIS configuration

Description

This command is used to enable or disable RNDIS function with specified cid.

Format

Type	Command	Response
Setting command	AT+GTRNDIS=<status>,<cid>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+ GTRNDIS?	Response 1: +GTRNDIS: <status>,<cid>,<ip>,<pdns>,<sdns> OK
		Response 2: +GTRNDIS: 0 OK
Query command parameter range	AT+ GTRNDIS =?	+GTRNDIS: (list of supported < status >s),(list of supported <cid>s) OK

Parameter

Name	Description	Value
status	RNDIS activation status	Type: integer <ul style="list-style-type: none"> • 0: deactivate RNDIS (default) • 1: active RNDIS
cid	Profile ID used by RNDIS and specified with AT+CGDCONT	Type: integer
ip	IP address allocated by network to RNDIS device through PDP context	Type: string
pdns	Primary DNS allocated by network to RNDIS device through PDP context	Type: string
sdns	Secondary DNS allocated by network to RNDIS device through PDP context	Type: string

Characteristic

Require SIM Card Normal	Yes	Require Network Registration	Yes
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	No
Max Response Duration (ms)	30000	Max Result Returning Duration (ms)	30000

Example

AT+GTRNDIS=?

①

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

OK

AT+GTRNDIS=1,1

②

OK

AT+GTRNDIS?

③

1,1,"10.17.203.254,240e:ff:b442:ec6a:39cd:3d4c:c2dc:c1a9","202.96.134.33,240e:1f:1::1","202.96.128.166,240e:1f:1::33"

OK

① Query available parameters and ranges.

② Activate GTRNDIS.

③ Confirm current activation status.

14.2 +GTAUTOCONNECT, automatically activate PDP

Description

The ECM/RNDIS function of the default cid is automatically activated during a USB mode-based startup.

Format

Type	Command	Response
Setting command	AT+GTAUTOCONNECT=<n>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTAUTOCONNECT?	+GTAUTOCONNECT: <n> OK
Query command parameter range	AT+GTAUTOCONNECT=?	+GTAUTOCONNECT: (list of supported <n>s)

Type	Command	Response	
		OK	
Parameter			
Name	Description	Value	
n	Automatic dial switch	0: disable automatic dialing(default) 1: enable automatic dialing	
Characteristic			
Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example**AT+GTAUTOCONNECT=1**

OK

AT+GTAUTOCONNECT?

+GTAUTOCONNECT: 1

OK

AT+GTAUTOCONNECT=?

+GTAUTOCONNECT: (0,1)

OK

14.3 +GTIPPASS, enable IP pass

Description

This command is used to enable the IP pass function of all data dialing. It is set before enabling data dialing. All addresses allocated by ECM are network public IP addresses.

Format

Type	Command	Response
Query command	AT+GTIPPASS=<state>	Response 1: OK Response 2: ERROR

Type	Command	Response
Read current settings	AT+GTIPPASS?	+GTIPPASS: <state> OK
Query command parameter range	AT+GTIPPASS=?	+GTIPPASS: (list of supported <state>s) OK

Parameter

Name	Description	Value
state	IP pass switch	Type: integer 0: disable IP pass (default value) 1: enable IP pass

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTIPPASS=0

OK

AT+GTIPPASS?

+GTIPPASS: 0

OK

AT+GTIPPASS=?

+GTIPPASS: (0,1)

OK

14.4 +GTPREDNSCFG, pre-configure DNS addresses

Description

When the network does not send the DNS address to the terminal, the user pre-configures the primary and secondary DNS addresses.

Format

Type	Command	Response
Query command	AT+GTPREDNSCFG=<mode>[,<pri_dns_server>[,<sec_dns_server>]]	Response 1: OK Response 2: ERROR
Read current settings	AT+GTPREDNSCFG?	+GTPREDNSCFG: <mode>[,<pri_dns_server>[,<sec_dns_server>]] OK
Query command parameter range	AT+GTPREDNSCFG=?	+GTPREDNSCFG: (list of supported <mode>s),(list of supported <pri_dns_server>s),(list of supported <sec_dns_server>s) OK

Parameter

Name	Description	Value
mode	Mode	Type: integer 0: disable the pre-configuration function(default) 1: enable the pre-configuration function
pri_dns_server	Primary DNS	Type: string Preconfigured primary DNS server
sec_dns_server	Secondary DNS	Type: string Preconfigured secondary DNS server

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	Yes	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

AT+GTPREDNSCFG=0

OK

AT+GTPREDNSCFG?

+GTPREDNSCFG: 0

OK

AT+GTPREDNSCFG=1,"114.114.114.114","8.8.8.8"

OK

AT+GTPREDNSCFG?

+GTPREDNSCFG: 1,"114.114.114.114","8.8.8.8"

OK

AT+GTPREDNSCFG=?

+GTPREDNSCFG: (0,1),16,16

OK

14.5 +GTDHCPRANGE, set DHCP IP range

Description

This command is used to set the DHCP IP range customized by ECM/RNDIS.

Format

Type	Command	Response
Query command	AT+GTDHCPRANGE =<bridge_ip>,<dhcp_start_ip>,<dhcp_end_ip>	Response 1: OK
		Response 2: ERROR
Read current settings	AT+GTDHCPRANGE?	+GTDHCPRANGE: <bridge_ip>,<dhcp_start_ip>,<dhcp_end_ip> OK
Query command parameter range	AT+GTDHCPRANGE=?	+GTDHCPRANGE: (max length of supported <bridge_ip>),(max length of supported <dhcp_start_ip>),(max length of supported <dhcp_end_ip>) OK

Parameter

Name	Description	Value
bridge_ip	Bridge IP	Type: string Default value: 192.168.225.1
dhcp_start_ip	DHCP start IP	Type: string Default value: 192.168.225.2
dhcp_end_ip	DHCP end IP	Type: string Default value: 192.168.225.2

Characteristic

Require SIM Card Normal	No	Require Network Registration	No
Require Data Connection	No	Async or Sync Command	Sync command
Require Restart to Take Effect	No	Require Data Store at Power Down	Yes
Max Response Duration (ms)	1000	Max Result Returning Duration (ms)	1000

Example

```
AT+GTDHCPRANGE= "192.168.225.1", "192.168.225.20", "192.168.225.60"
```

```
OK
```

```
AT+GTDHCPRANGE?
```

```
+GTDHCPRANGE: "192.168.225.1", "192.168.225.20", "192.168.225.60"
```

```
OK
```

```
AT+GTDHCPRANGE=?
```

```
+GTDHCPRANGE: (32), (32), (32)
```

```
OK
```

15 Error Code Table

15.1 CME Error Codes

<err> Value	Description
0	phone failure
1	no connection to phone
2	phone-adapter link reserved
3	operation not allowed
4	operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
19	incorrect PUK1
20	memory full
21	invalid index
22	not found
23	memory failure
24	text string too long
25	invalid characters in text string
26	dial string too long
27	invalid characters in dial string
30	no network service

<err> Value	Description
31	network timeout
32	network not allowed - emergency calls only
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required
49	EAP method not supported
50	Incorrect parameters
100	unknown
103	Illegal MS
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	location area not allowed
113	roaming not allowed in this location area
114	GPRS services not allowed in this PLMN
116	MSC temporarily not reachable
117	Network failure
132	Service not supported
133	Service not subscribed
134	service option temporarily out of order
135	NS-api already used
148	Unspecified GPRS error
149	PDP authentication error
150	invalid mobile class
244	Attach failure

<err> Value	Description
257	Invalid error mapping
258	APN not listed in APN Control List (ACL)
701	incorrect security code
702	max attempts reached
1001	Unassigned (unallocated) number
1003	No route to destination
1006	Channel unacceptable
1008	Operator determined barring
1016	Normal call clearing
1017	User busy
1018	No user responding
1019	User alerting no answer
1021	Call rejected
1022	Number changed
1026	Non selected user clearing
1027	Destination out of order
1028	Invalid number format (incomplete number)
1029	Facility rejected
1030	Response to STATUS ENQUIRY
1031	Normal unspecified
1034	No circuit/channel available
1038	Network out of order
1041	Temporary failure
1042	Switching equipment congestion
1043	Access information discarded
1044	requested circuit/channel not available
1047	Resources unavailable unspecified
1049	Quality of service unavailable
1050	Requested facility not subscribed
1055	Incoming calls barred within the CUG
1057	Bearer capability not authorized

<err> Value	Description
1058	Bearer capability not presently available
1063	Service or option not available unspecified
1065	Bearer service not implemented
1068	ACM equal to or greater than ACMmax
1069	Requested facility not implemented
1070	Only restr. digital information bearer capability
1079	Service or option not implemented unspecified
1081	Invalid transaction identifier value
1087	User not member of CUG
1088	Incompatible destination
1091	Invalid transit network selection
1095	Semantically incorrect message
1096	Invalid mandatory information
1097	Message type non-existent or not implemented
1098	Message type not compatible with protocol state
1099	Information element non-existent or not implemented
1100	Conditional IE error
1101	Message not compatible with protocol state
1102	Recovery on timer expiry
1111	Protocol error unspecified
1127	Interworking unspecified
1279	Number not allowed
1283	CCBS possible

15.2 CMS Error Codes

<err> Value	Description
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
17	Network failure
21	Short message transfer rejected

<err> Value	Description
22	Memory capacity exceeded
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown Subscriber
38	Network out of order
41	Temporary failure
42	Congestion
47	Resources unavailable unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message reference value
95	Invalid message unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error unspecified
127	Interworking unspecified
128	Telematic interworking not supported
129	Short message type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme (alphabet) not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be action
161	Command unsupported
175	Unspecified TP-Command error
176	TPDU not supported
192	SC busy

<err> Value	Description
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
197	SM Rejected-Duplicate SM
198	TP-VPF not supported
199	TP-VP not supported
208	SIM SMS storage full
209	No SMS storage capability in SIM
210	Error in MS
211	Memory Capacity Exceeded
212	SIM Application Toolkit Busy
213	SIM data download error
224	TP_FCS_APPL_ERR_START
254	TP_FCS_APPL_ERR_STOP
255	TP_FCS_UNSPECIFIED
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	Invalid PDU mode param
305	invalid text mode parameter
310	SIM not inserted
311	SIM PIN required
312	PH-SIM PIN necessary
313	SIM failure
314	SIM busy
315	SIM wrong
317	SIM PIN2 required
318	SIM PUK2 required
319	incorrect PUK1

<err> Value	Description
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
512	MN_SMS_RP_ACK
513	MN_SMS_TIMER_EXPIRED
514	MN_SMS_FORW_AVAIL_FAILED
515	MN_SMS_FORW_AVAIL_ABORTED
516	MS invalid TP-Message-Type-Indicator
517	MS no TP-Status-Report in Phase 1
518	MS no TP-Reject-Duplicate in Phase 1
519	MS no TP-Reply-Path in Phase 1
520	MS no TP-User-Data-Header in Phase 1
521	MS missing TP-Validity-Period
522	MS invalid TP-Service-Centre-Time-Stamp
523	MS missing TP-Destination-Address
524	MS invalid TP-Destination-Address
525	MS missing Service-Centre-Address
526	MS invalid Service-Centre-Address
527	MS invalid alphabet
528	MS invalid TP-User-Data-Length
529	MS missing TP-User-Data
530	MS TP-User-Data too long
531	MS no Command-Request in Phase 1
532	MS Cmd-Req invalid TP-Destination-Address
533	MS Cmd-Req invalid TP-User-Data-Length
534	MS Cmd-Req invalid TP-User-Data
535	MS Cmd-Req invalid TP-Command-Type

<err> Value	Description
536	MN MNR creation failed
537	MS CMM creation failed
538	MS network connection lost
539	MS pending MO SM transfer
540	RP-Error OK
541	RP-Error OK no icon display
542	SMS-PP Unspecified
543	SMS rejected By SMS CONTROL