UC200A-GL&UC200T&
UG89 Series
AT Commands Manual

UMTS/HSPA+ Module Series

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Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

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About the Document

History

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1 Introduction

This document presents the AT Commands Set for Quectel UC200A-GL, UC200T series and UG89 modules. The commands and configurations for LTE network are not supported by UC200A-GL, UC200T series and UG89 modules.

1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on the command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals to its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

AT commands implemented by UC200A-GL, UC200T series and UG89 fall into three categories syntactically: “Basic”, “S Parameter” and “Extended”, as listed below:

- **Basic Command**

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

- **S Parameter Syntax**

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

- **Extended Command**

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

Table 1: Types of AT Commands

Command Type	Syntax	Description
Test Command	**AT+<cmd>=?**	Test the existence of corresponding Write Command and return information about the type, value, or range of its parameter.
Read Command	**AT+<cmd>?**	Check the current parameter value of a corresponding Write Command.
Write Command	**AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]**	Set user-definable parameter value.
Execution Command	**AT+<cmd>**	Return a specific information parameter or perform a specific action.

Multiple commands can be placed on a single line using a semi-colon (**;**) between commands. In such cases, only the first command should have **AT** prefix. Commands can be in upper or lower case.

Spaces should be ignored when you enter AT commands, except in the following cases:

- Within quoted strings, where spaces are preserved;
- Within an unquoted string or numeric parameter;
- Within an IP address;
- Within the AT command name up to and including a **=**, **?** or **=?**.

On input, at least a carriage return is required. A newline character is ignored so it is permissible to use carriage return/line feed pairs on the input.

If no command is entered after the **AT** token, **OK** will be returned. If an invalid command is entered, **ERROR** will be returned.

Optional parameters, unless explicitly stated, need to be provided up to the last parameter being entered.

1.3. AT Command Responses

When the AT command processor has finished processing a line, it will output **OK**, **ERROR** ,or **+CME ERROR: <err>** to indicate that it is ready to accept a new command. Solicited information responses are sent before the final **OK**, **ERROR** or **+CME ERROR: <err>**.

Responses will be in the format of:

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

Or

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

1.4. Supported Character Sets

The AT command interface of the module uses the **GSM** character set by default and supports the following character sets:

- GSM format
- UCS2
- IRA

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

1.5. AT Command Port

The main UART port and two USB ports (USB modem port and USB AT port) support AT command communication and data transfer.

1.6. Unsolicited Result Code

As an Unsolicited Result Code and a report message, URC is not issued as part of the response related to an executed AT command. URC is issued by UC200A-GL, UC200T series and UG89 without being requested by the TE and it is issued automatically when a certain event occurs. Typical events leading to URCs are incoming calls (**RING**), received short messages, high/low voltage alarm, high/low temperature alarm, etc.

1.7. Turn off Procedure

It is recommended to execute **AT+QPOWD** command to turn off the module, as it is the safest and best way. This procedure is realized by letting the module log off from the network and allowing the software to enter into a secure and safe data state before disconnecting the power supply.

After sending **AT+QPOWD**, please do not enter any other AT commands. When the command is executed successfully, the module will output message **POWERED DOWN** and then enter the power-off state. In order to avoid data loss, it is suggested to wait for 3 s to disconnect the power supply after the URC **POWERED DOWN** is outputted. If **POWERED DOWN** cannot be received within 65 s, the power supply shall be switched off compulsorily.

1.8. Declaration of AT Command Examples

The AT command examples in this document are provided to help you learn about how to use the AT commands introduced herein. The examples, however, should not be taken as Quectel's recommendation or suggestions about how you should design a program flow or what status you should set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there exists a correlation among these examples and that they should be executed in a given sequence.

2 General Commands

2.1. ATI Display Product Identification Information

This command delivers a product information text.

ATI Display Product Identification Information	
Execution Command **ATI**	Response **Quectel** **<objectID>** **Revision: <revision>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<objectID>	String type. Identifier of device type.
<revision>	String type. Identification text of product software version.

Example

```
ATI
Quectel
UC200T
Revision: UC200TEMAAR02A01M16

OK
```

2.2. AT+GMI Request Manufacturer Identification

This command returns a manufacturer identification text. It is identical with **AT+CGMI** in ***Chapter 2.5***.

AT+GMI Request Manufacturer Identification	
Test Command **AT+GMI=?**	Response **OK**
Execution Command **AT+GMI**	Response **Quectel** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

2.3. AT+GMM Request TA Model Identification

This command returns a product model identification text. It is identical with **AT+CGMM** in ***Chapter 2.6***.

AT+GMM Request TA Model Identification	
Test Command **AT+GMM=?**	Response **OK**
Execution Command **AT+GMM**	Response **<objectID>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<objectID>	String type. Identifier of device type.

2.4. AT+GMR Request TA Revision Identification of Software Release

This command delivers a product firmware version identification text. It is identical with **AT+CGMR** in ***Chapter 2.7***.

AT+GMR Request TA Revision Identification of Software Release	
Test Command **AT+GMR=?**	Response **OK**
Execution Command **AT+GMR**	Response **<revision>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<revision>	String type. Identification text of software version, including line terminators, which should not exceed 2048 characters in the information text.

Example

```
AT+GMR
UC200TEMAAR02A01M16

OK
```

2.5. AT+CGMI Request Manufacturer Identification

This command returns a manufacturer identification text. It is identical with above **AT+GMI**.

AT+CGMI Request Manufacturer Identification	
Test Command **AT+CGMI=?**	Response **OK**
Execution Command **AT+CGMI**	Response **Quectel**

	OK
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

2.6. AT+CGMM Request Model Identification

This command returns a product model identification text. It is identical with above **AT+GMM.**

AT+CGMM Request Model Identification	
Test Command **AT+CGMM=?**	Response **OK**
Execution Command **AT+CGMM**	Response **<objectID>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<objectID>	String type. Identifier of device type.

2.7. AT+CGMR Request TA Revision Identification of Software Release

This command delivers a product firmware version identification text. It is identical with above **AT+GMR**.

AT+CGMR Request TA Revision Identification of Software Release	
Test Command **AT+CGMR=?**	Response **OK**
Execution Command **AT+CGMR**	Response **<revision>**

	OK
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<revision>	String type. Identification of software version, including line terminators, which should not exceed 2048 characters in the information text.

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

This command returns the International Mobile Equipment Identity (IMEI) number of ME. Which permits the users to identify individual ME device. It is identical with **AT+CGSN** in ***Chapter 2.9***.

AT+GSN Request International Mobile Equipment Identity (IMEI)	
Test Command **AT+GSN=?**	Response **OK**
Execution Command **AT+GSN**	Response **<IMEI>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

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

NOTE

The IMEI is unique to each ME, so it can be used to identify an ME.

2.9. AT+CGSN Request International Mobile Equipment Identity

This command returns International Mobile Equipment Identity (IMEI) number of ME. It is identical with above **AT+GSN**.

AT+CGSN International Mobile Equipment Identity	
Test Command **AT+CGSN=?**	Response **OK**
Execution Command **AT+CGSN**	Response **<IMEI>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

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

NOTE

The IMEI is unique to each ME, so it can be used to identify an ME.

2.10. AT&F Reset AT Command Settings to Factory Defaults

This command resets AT command settings to the default values specified by the manufacturer (see ***Table 6***).

AT&F Reset AT Command Settings to Factory Defaults	
Execution Command **AT&F[<value>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference	

V.25ter	

Parameter

<value>	Integer type. 0 Reset all AT command settings to factory defaults.

2.11. AT&V Display Current Configuration

This command displays the current settings of several AT command parameters (see ***Table 2***), including the single-letter AT command parameters which are not readable.

AT&V Display Current Configuration	
Execution Command **AT&V**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Table 2: AT&V Response

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

S8: 2
S10: 15

OK

2.12. AT&W Store Current Parameters to User Defined Profile

This command stores the current AT command settings to a user-defined profile in non-volatile memory (see ***Table 7***). The AT command settings will be automatically restored from the user-defined profile during power-up or **ATZ** is executed after power-up.

AT&W Store Current Parameters to User Defined Profile	
Execution Command **AT&W[<n>]**	Response **OK**
Maximum Response Time	300 ms
Reference V.25ter	

Parameter

<n>	Integer type. 0 Profile number to store current parameters

2.13. ATZ Set All Current Parameters to User Defined Profile

This command first resets the AT command settings to the default values specified by the manufacturer, similar to **AT&F**. Afterwards the AT command settings are restored from the user-defined profile in non-volatile memory, if they have been stored with AT&W before (See ***Table 7***).

Any additional AT command on the same command line may be ignored.

ATZ Set All Current Parameters to User Defined Profile	
Execution Command **ATZ[<value>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference	

V.25ter	

Parameter

<value>	Integer type. 0 Reset to profile number 0

2.14. ATQ Set Result Code Presentation Mode

This command controls whether the result code is transmitted to the TE. Other information text transmitted as response is not affected.

ATQ Set Result Code Presentation Mode	
Execution Command **ATQ<n>**	Response If **<n>** = 0: **OK** If **<n>** = 1: (none)
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type. 0 TA transmits result code 1 Result codes are suppressed and not transmitted

2.15. ATV TA Response Format

This command determines the contents of header and trailer transmitted with AT command result codes and information responses.

The numeric equivalents and brief descriptions of results code are listed in the ***Table 3***.

ATV TA Response Format	
Execution Command **ATV<value>**	Response When **<value>** = 0 **0** When **<value>** = 1 **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<value>	Integer type.	
	0	Information response: **<text><CR><LF>** Short result code format: **<numeric code><CR>**
	1	Information response: **<CR><LF><text><CR><LF>** Long result code format: **<CR><LF><verbose code><CR><LF>**

Example

```
ATV1                                    //Set <value> = 1
OK
AT+CSQ
+CSQ: 30,99

OK                                      //When <value> = 1, the result code is OK.
ATV0                                    //Set <value> = 0
0
AT+CSQ
+CSQ: 30,99
0                                       //When <value> = 0, the result code is 0.
```

Table 3: The Numeric Equivalents and Brief Description of ATV0&ATV1

ATV1	ATV0	Description
OK	0	Acknowledges execution of a command.
CONNECT	1	A connection has been established. The DCE is switching

		from command mode to data mode.
RING	2	The DCE has detected an incoming call signal from network.
NO CARRIER	3	The connection has been terminated or the attempt to establish a connection failed.
ERROR	4	Command not recognized caused by command line maximum length exceeded, parameter value invalid, or other problem with processing the command line.
NO DIALTONE	6	No dial tone detected.
BUSY	7	Engaged (busy) signal detected.
NO ANSWER	8	(Wait for Quiet Answer) dial modifier was used, but remote ringing followed by five seconds of silence was not detected before expiration of the connection timer (S7).

2.16. ATE Set Command Echo Mode

This command controls whether the module echoes characters received from TE or not during AT command mode.

ATE Set Command Echo Mode	
Execution Command **ATE<value>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<value>	Integer type.	
	0	Echo mode OFF
	1	Echo mode ON

2.17. ATS3 Set Command Line Termination Character

This command determines the character recognized by the module to terminate an incoming command line. It is also generated for result codes and information text, along with character value set via **ATS4**.

ATS3 Set Command Line Termination Character	
Read Command **ATS3?**	Response **<n>** **OK**
Write Command **ATS3=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type. Command line termination character. Range: Range: 0–127. (Default 13 = **<CR>**)

2.18. ATS4 Set Response Formatting Character

This command determines the character generated by the module for result code and information text, along with the command line termination character set via **ATS3**.

ATS4 Set Response Formatting Character	
Read Command **ATS4?**	Response **<n>** **OK**
Write Command **ATS4=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type. Response formatting character. Range: 0–127. (Default 10 = **<LF>**)

2.19. ATS5 Set Command Line Editing Character

This command determines the value of editing character used by the module to delete the immediately preceding character from the AT command line (i.e. equates to backspace key).

ATS5 Set Command Line Editing Character	
Read Command **ATS5?**	Response **<n>** **OK**
Write Command **ATS5=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type. Response editing character. Range: 0–127. (Default 8 = **<Backspace>**)

2.20. ATX Set CONNECT Result Code Format and Monitor Call Progress

This command determines whether TA transmits particular result codes to TE or not. It also controls whether TA detects the presence of a dial tone when it begins dialing and the engaged tone (busy signal) or not.

ATX Set CONNECT Result Code Format and Monitor Call Progress	
Execution Command **ATX<value>**	Response **OK**
Maximum Response Time	300 ms

Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<value>	Integer type. 0 **CONNECT** result code returned only. Dial tone and busy detection are both disabled. 1 **CONNECT<text>** result code returned only. Dial tone and busy detection are both disabled. 2 **CONNECT<text>** result code returned. Dial tone detection is enabled, while busy detection is disabled. 3 **CONNECT<text>** result code returned. Dial tone detection is disabled, while busy detection is enabled. 4 **CONNECT<text>** result code returned. Both dial tone and busy detection are enabled.

2.21. AT+CFUN Set Phone Functionality

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

AT+CFUN Set Phone Functionality	
Test Command **AT+CFUN=?**	Response **+CFUN: (**range of supported **<fun>**s**),(**list of supported **<rst>**s**)** **OK**
Read Command **AT+CFUN?**	Response **+CFUN: <fun>** **OK**
Write Command **AT+CFUN=<fun>[,<rst>]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	15 s, determined by network.
Characteristics	/
Reference	

3GPP TS 27.007	

Parameter

<fun>	Integer type.	
	0	Minimum functionality
	1	Full functionality
	3	Disable the ME from receiving RF signals
	4	Disable the ME from both transmitting and receiving RF signals
	5	Disable (U)SIM
<rst>	Integer type.	
	0	Do not reset the ME before setting it to **<fun>** functionality level. (This is the default setting when **<rst>** is not given.)
	1	Reset the ME. The device is fully functional after the reset. This value is available only for **<fun>** = 1
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CFUN=0                    //Switch UE to minimum functionality
OK
AT+COPS?
+COPS: 0                     //No operator is registered

OK
AT+CPIN?
+CME ERROR: 13               //(U)SIM failure
AT+CFUN=1                    //Switch UE to full functionality
OK

+CPIN: SIM PIN
AT+CPIN=1234
OK

+CPIN: READY

+QUSIM: 1

+QIND: PB DONE

+QIND: SMS DONE
AT+CPIN?
+CPIN: READY
```

```
OK
AT+COPS?
+COPS: 0,0,"CHN-UNICOM",6                    //Operator is registered

OK
```

2.22. AT+CMEE Error Message Format

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

AT+CMEE Error Message Format	
Test Command **AT+CMEE=?**	Response **+CMEE: (**range of supported **<n>**s**)** **OK**
Read Command **AT+CMEE?**	Response **+CMEE: <n>** **OK**
Write Command **AT+CMEE=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type.	
	0	Disable result code and **ERROR** will be reported if there is an error occurs
	1	Enable result code with numeric values
	2	Enable result code with verbose values
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CMEE=0                    //Disable result code and ERROR will be reported if there is an error occurs
OK
```

```
AT+CPIN?
ERROR                    //Only ERROR will be displayed
AT+CMEE=1                //Enable error result code with numeric values
OK
AT+CPIN?
+CME ERROR: 10
AT+CMEE=2                //Enable error result code with verbose (string) values
OK
AT+CPIN?
+CME ERROR: SIM not inserted
```

2.23. AT+CSCS Select TE Character Set

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

AT+CSCS Select TE Character Set	
Test Command **AT+CSCS=?**	Response **+CSCS: (**list of supported **<chset>**s**)** **OK**
Read Command **AT+CSCS?**	Response **+CSCS: <chset>** **OK**
Write Command **AT+CSCS=<chset>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<chset>	String type.	
	"GSM"	GSM default alphabet
	"IRA"	International reference alphabet
	"UCS2"	UCS2 alphabet

Example

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

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

OK
```

2.24. AT+QURCCFG Configure URC Indication Option

This command configures the output port of URC.

AT+QURCCFG Configure URC Indication Option	
Test Command **AT+QURCCFG=?**	Response **+QURCCFG: "urcport",(**list of supported **<URC_port_value>**s**)** **OK**
Write Command **AT+QURCCFG="urcport"[,<URC_port_value>]**	If the optional parameter is omitted, return current configuration: **+QURCCFG: "urcport",<URC_port_value>** **OK** If the optional parameter is specified, configures the output port of URC. **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved automatically.

Parameter

<URC_port_value>	String type. Set URC output port.	
	"usbat"	USB AT port
	"usbmodem"	USB modem port
	"uart1"	Main UART

Example

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

OK
AT+QURCCFG="urcport"
+QURCCFG: "urcport","usbat"

OK
AT+QURCCFG="urcport","usbmodem"
OK
AT+QURCCFG="urcport"
+QURCCFG: "urcport","usbmodem"

OK
```

2.25. AT+CUSD Unstructured Supplementary Service Data

This command allows control of the Unstructured Supplementary Service Data (USSD) according to *3GPP TS 22.090*. Both network and mobile initiated operations are supported.

Parameter **<mode>** is used to disable/enable the presentation of an unsolicited result code. **<mode>**=2 is used to cancel an ongoing USSD session. For an USSD response from the network or a network initiated operation, the format is: **+CUSD: <status>[,<rspstr>,[<dcs>]]**.

When **<reqstr>** is given, a mobile initiated USSD string or a response USSD string to a network-initiated operation is sent to the network. The response USSD string from the network is returned in a subsequent **+CUSD** URC.

AT+CUSD Unstructured Supplementary Service Data	
Test Command **AT+CUSD=?**	Response **+CUSD: (**range of supported **<mode>**s**)** **OK**

Read Command **AT+CUSD?**	Response **+CUSD: <mode>** **OK**
Write Command **AT+CUSD=[<mode>[,<reqstr>[,<dcs>]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	120 s, determined by network.
Characteristics	The command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<mode>	Integer type. Disable/enable the result code presentation status to the TE. 0 Disable the result code presentation to the TE 1 Enable the result code presentation to the TE 2 Cancel session (not applicable to Read Command response)
<reqstr>	String type. Unstructured Supplementary Service Data (USSD) to be sent to the network. If this parameter is not given, network is not interrogated.
<rspstr>	String type. Unstructured Supplementary Service Data (USSD) received from the network.
<dcs>	Integer type. *3GPP TS 23.038* Cell Broadcast Data Coding Scheme, Default: 15.
<status>	Integer type. USSD response from the network or the network-initiated operation. 0 No further user action required (network initiated USSD Notify, or no further information needed after mobile initiated operation) 1 Further user action required (network initiated USSD Request, or further information needed after mobile initiated operation) 2 USSD terminated by network 3 Other local client has responded 4 Operation not supported 5 Network time out
<err>	Error codes. See ***Chapter 11.5*** for details.

2.26. AT+QCUSDCVT Configure the Return Format of AT+CUSD

This command configures the return format of **AT+CUSD** as string.

AT+QCUSDCVT Configure the Return Format of AT+CUSD	
Test Command **AT+QCUSDCVT=?**	Response **+QCUSDCVT: (**list of supported **<enable>**s**)** **OK**
Read Command **AT+QCUSDCVT?**	Response **+QCUSDCVT: <enable>** **OK**
Write Command **AT+QCUSDCVT=<enable>**	Response **OK**
Characteristics	The command takes effect after rebooting. The configurations will be saved automatically.

Parameter

<enable>	Integer type. Enable/Disable to configure return format **AT+CUSD** as string.	
	0	Disable
	1	Enable

Example

```
AT+QCUSDCVT?                    //Query the current configuration.
+QCUSDCVT: 0

OK
AT+CUSD=1,"**100#"
OK

+CUSD: 2,"556e6b6e6f776e20416c706861626574",0
AT+QCUSDCVT=1
OK                              //Configure the return format of AT+CUSD.
AT+CUSD=1,"**100#"
OK

+CUSD: 2,"Unknown Alphabet",0
```

2.27. AT^DSCI Call Status Indication

This command indicates the call status.

AT^DSCI Call Status Indication	
Test Command **AT^DSCI=?**	Response **^DSCI: (**list of supported **<n>**s**)** **OK**
Read Command **AT^DSCI?**	Response **^DSCI: <n>** **OK**
Write Command **AT^DSCI=<n>**	Response **OK**
Characteristics	/

Parameter

<n>	Integer type. Enable/disable the presentation of the DSCI at TE . 0 Disable 1 Enable
<id>	Integer type. Call ID.
<dir>	Integer type. Call direction. 0 Mobile originated call 1 Mobile terminated call
<stat>	Integer type. Call state. 1 CALL_HOLD 2 CALL_ORIGINAL 3 CALL_CONNECT 4 CALL_INCOMING 5 CALL_WAITING 6 CALL_END 7 CALL_ALERTING
<type>	Integer type. Call type. 0 Voice call 1 PS call
<number>	Integer type. Phone number.
<num_type>	Integer type. Type of phone number. Type of address of octet in integer format (see *3GPP TS 24.008*). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character "+") 161 National type

NOTE

When the presentation of the DSCI at TE is enabled, an unsolicited result code is returned after the action:
^DSCI: <id>,<dir>,<stat>,<type>,<number>,<num_type>

Example

```
//Dial a call
AT^DSCI=1                          //Enable DSCI.
OK
ATD10086;                          //Dial 10086.
OK

^DSCI: 1,0,2,0,10086,129           //A call is originated.

^DSCI: 1,0,7,0,10086,129           //The call is alerting.

^DSCI: 1,0,3,0,10086,129           //The call is connected.

ATH
OK

^DSCI: 1,0,6,0,10086,129           //The call is ended.

//Incoming call
RING

^DSCI: 1,1,4,0,13022100000,129     //The call is incoming.

RING

^DSCI: 1,1,6,0,13022100000,129     //The call is ended.

NO CARRIER
```

2.28. AT+QADCEXT Set the Voltage Detection in the Sleep State

This command configures whether the module needs to be shut down by detecting the state of the external voltage when the module enters the sleep state.

AT+QADCEXT Set the Voltage Detection in the Sleep State	
Test Command **AT+QADCEXT=?**	Response **+QADCEXT:** (range of supported **<mode>**s)**,(**range of supported **<channel>**s)**,(**range of supported **<voltage>**s)**,(**range of supported **<time>**s) **OK**
Read Command **AT+QADCEXT?**	Response **+QADCEXT:<mode>,<channel>** **OK**
Execution Command **AT+QADCEXT**	Response **OK** Or **ERROR**
Write Command **AT+QADCEXT=<mode>,<channel>,<voltage>,<time>**	Response **OK** Or **ERROR**
Turn off the function occupied by the ADC channel **AT+QADCEXT=<enable>[,<channel>]** (When**<channel>**is specified, it means the disabling of the set features of specified ADC channel; when **<channel>** is omitted, it means the disabling of the set features of all ADC channels.)	Response **OK** Or **ERROR**
Maximum Response Time	/
Characteristics	The configurations will not be saved automatically.

Parameter

<mode>	Integer type. Range: 0–2. 0 Disable 1 ADC detection voltage in the sleep state to shut down the module automatically 2 ADC detection voltage to switch internal and external antenna automatically
<channel>	Integer type. Range: 0–2. 0 When **<mode>**=1, it indicates set two channels simultaneously 1 When **<mode>**=1, it indicates ADC detection channel 0 2 When **<mode>**=1, it indicates ADC detection channel 1
<voltage>	Integer type. Range: 0–4000. When **<mode>**=1, it indicates the set voltage threshold, Unit: mV.
<time>	Integer type. Range: 0–65535. When **<mode>**=1, it indicates the time the voltage detection lowers than the set value continuously. Unit: second.
<enable>	Integer type. 0 Disable ADC channel.

NOTE

The feature of ADC detection to switch internal and external antenna automatically is not currently supported.

Example

```
AT+QADCEXT =1,1,2000,100        //Enable the feature of ADC detection voltage in the sleep state to shut down the module automatically. The detected ADC channel is channel 0. ADC channel voltage is 2000 mV. Within 100 seconds, when the detection voltage is lower than the configured ADC channel voltage, the module will automatically shut down.
OK
AT+QADCEXT=0                    //Disable the set features for all ADC channels.
OK
AT+QADCEXT =0,1                 //Disable the set features for all ADC channels 0.
OK
```

2.29. AT+CGAUTO Set Number of Rings before Automatically Answering (For UG89 Only)

This command controls automatic answering for the incoming calls.

AT+CGAUTO Set Number of Rings before Automatically Answering	
Read Command **AT+CGAUTO?**	Response **<n>** **OK**
Write Command **AT+CGAUTO=<n>**	Response **OK** Or **ERROR**
Maximum Response Time	/
Characteristics	This command takes effect immediately. The configuration will not be saved.

Parameter

<n>	Integer type. Range: 0–255.	
	0	Disable automatic answering call.
	1-255	Enable automatic answering on the ring number specified.

NOTE

1. If **<n>** is set too high, the calling party may hang up before the call is answered automatically.
2. This command is applicable for UG89 only.

Example

```
AT+CGAUTO=3          //Set three rings before automatically answering a call.
OK

RING                 //A call is coming.

RING

RING                 //Automatically answering the call after three rings.
```

2.30. ATS0 Set Number of Rings before Automatically Answering

This command controls automatic answering for the incoming calls.

ATS0 Set Number of Rings before Automatically Answering	
Read Command **ATS0?**	Response **<n>** **OK**
Write Command **ATS0=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration can be saved with **AT&W**.
Reference V.25ter	

Parameter

<n>	Integer type. This parameter setting determines the number of rings before auto-answer.	
	0	Automatic answering is disabled
	1–255	Enable automatic answering on the ring number specified

NOTE

If **<n>** is set too high, the calling party may hang up before the call is answered automatically.

Example

```
ATS0=3                    //Set three rings before automatically answering a call.
OK

RING                      //A call is coming.

RING

RING                      //Automatically answering the call after three rings.
```

2.31. ATS6 Set Pause before Blind Dialing

This command is implemented for compatibility reasons only and has no effect.

ATS6 Set Pause before Blind Dialing	
Read Command **ATS6?**	Response **<n>** **OK**
Write Command **ATS6=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration can be saved with **AT&W**.
Reference V.25ter	

Parameter

<n>	Integer type. Number of seconds to wait before blind dialing. Range: 0–10. Default value: 2.

2.32. ATS7 Set the Time to Wait for Connection Completion

This command specifies the time (unit: second) to wait for the connection completion in case of answering or originating a call. If no connection is established during the time, the module disconnects from the line.

ATS7 Set the Time to Wait for Connection Completion	
Read Command **ATS7?**	Response **<n>** **OK**
Write Command **ATS7=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration can be saved with **AT&W**.
Reference V.25ter	

Parameter

<n>	Integer type.	
	0	Disabled
	1–255	The time to wait for connection completion. Unit: second.

2.33. ATS8 Set the Time to Wait for Comma Dial Modifier

This command is implemented for compatibility reasons only and has no effect.

ATS8 Set the Time to Wait for Comma Dial Modifier	
Read Command **ATS8?**	Response **<n>** **OK**
Write Command **ATS8=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration can be saved with **AT&W**.
Reference V.25ter	

Parameter

<n>	Integer type. Default value: 2.	
	0	No pause when comma encountered in dial string
	1–255	Number of seconds to wait for comma dial modifier

2.34. ATS10 Set Disconnection Delay after Indicating the Absence of Data Carrier

This command determines the time (unit: tenths of a second) during which the UE remains connected in absence of a data carrier. If the data carrier is once more detected before disconnection, the TA remains connected.

ATS10 Set Disconnection Delay after Indicating the Absence of Data Carrier	
Read Command **ATS10?**	Response **<n>** **OK**
Write Command **ATS10=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type. The time to wait before disconnecting after UE has indicated the absence of received line signal. Range: 1–255. Default value: 15. Unit: Tenths of a second.

2.35. AT+QPPPDROP Terminate PPP Connection

This command terminates the PPP connection.

AT+QPPPDROP Terminate PPP Connection	
Test Command **AT+QPPPDROP=?**	Response **+QPPPDROP: (**range of supported **<op>**s**)** **OK**
Write Command **AT+QPPPDROP[=<op>]**	Response **OK**
Maximum Response Time	300 ms

Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<op>	Integer type. The operation about dropping PPP connection. 0 Hang up PPP connection without sending TERM REQ frame to peer. 1 Hang up PPP connection and automatically send TERM REQ frame to peer. 2 Hang up PPP connection with sending TERM REQ frame to peer.

NOTE

1. This command will return **OK** immediately and then perform following procedures:
   Step 1: Check if PPP link exists. Run step 2 if exists.
   Step 2: Hang up PPP link and then output **NO CARRIER** to the port that's used for dialing up.
2. If **<op>** is 1, TERM REQ frame will be sent to peer only when PPP connection exists and dial-up port is in data mode.
3. If **<op>** is omitted, the hung-up procedure is the same as one that **<op>** is set to 1.

Example

```
AT+QPPPDROP //Send command from USB_AT port
OK          //Receive reslult from USB_AT port

//MCU's dial-up port receives the TERM REQ frame from module
7E FF 7D 23 C0 21 7D 25 7D 25 7D 20 7D 24 5C A4 7E

NO CARRIER  // PPP has been terminated and output this URC from dial-up port. If ATV0 is set,
               the module will output NO CARRIER as number format (3).
```

3 Serial Interface Control Commands

3.1. AT&C Set DCD Function Mode

This command controls the behavior of the UE's DCD (data carrier detection) line relates to the detection of received line signal from the distant end.

AT&C Set DCD Function Mode	
Execution Command **AT&C[<value>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<value>	Integer type. It determines how the state of circuit (DCD) relates to the detection of received line signal from the distant end. 0 DCD function is always ON 1 DCD function is ON only in the presence of data carrier

3.2. AT&D Set DTR Function Mode

This command determines how the UE responds if DTR line is changed from low to high level during data mode.

AT&D Set DTR Function Mode	
Execution Command **AT&D[<value>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/

Reference V.25ter	

Parameter

<value>	Integer type. 0 TA ignores status on DTR 1 Low→High on DTR: Change to command mode while remaining the connected call. 2 Low→High on DTR: Disconnect data call and change to command mode. When DTR is at high level, auto-answer function is disabled.

3.3. AT+IFC Set TE-TA Local Data Flow Control

This command determines the flow control behavior of the serial port.

AT+IFC Set TE-TA Local Data Flow Control	
Test Command **AT+IFC=?**	Response **+IFC: (**list of supported **<dce_by_dte>**s**),(**list of supported **<dte_by_dce>**s**)** **OK**
Read Command **AT+IFC?**	Response **+IFC: <dce_by_dte>,<dte_by_dce>** **OK**
Write Command **AT+IFC=<dce_by_dte>,<dte_by_dce>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved by **AT&W**.
Reference V.25ter	

Parameter

<dce_by_dte>	Integer type. Specify the method that will be used by TE when receiving data from TA 0 None 2 RTS flow control

<dte_by_dce>	Integer type. Specify the method that will be used by TA when receiving data from TE 0 None 2 CTS flow control

NOTE

1. The values of **<dce_by_dte>** and **<dte_by_dce>** must be the same.
2. Flow control is only applicable for data mode.

Example

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

OK
```

3.4. AT+IPR Set TE-TA Fixed Local Rate

This command queries and sets the baud rate of the UART.

AT+IPR Set TE-TA Fixed Local Rate	
Test Command **AT+IPR=?**	Response **+IPR: (**list of supported auto detectable **<rate>**s**),(**list of supported fixed-only **<rate>**s**)** **OK**
Read Command **AT+IPR?**	Response **+IPR: <rate>** **OK**
Write Command **AT+IPR=<rate>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved by **AT&W**.
Reference V.25ter	

Parameter

<rate>	Integer type. Baud rate per second of TA on the serial port. Unit: bps. 4800 9600 19200 38400 57600 115200 230400 460800 921600 1000000

NOTE

1. If a fixed baud rate is set, make sure that both TE (DTE, usually external processor) and TA (DCE, Quectel module) are configured to the same rate.
2. The value of **AT+IPR** can be restored with **AT&F** and **ATZ**.

Example

```
AT+IPR=115200                    //Set fixed baud rate to 115200 bps
OK
AT&W                             //Store current setting, that is, the serial communication
                                   speed is 115200 bps after restarting the module
OK
AT+IPR?
+IPR: 115200

OK
AT+IPR=115200;&W                 //Set fixed baud rate to 115200 bps and store current setting
OK
```

4 Status Control Commands

4.1. AT+CPAS Query Mobile Equipment Activity Status

This command queries the activity status of mobile equipment.

AT+CPAS Query Mobile Equipment Activity Status	
Test Command **AT+CPAS=?**	Response **+CPAS: (**list of supported **<pas>**s**)** **OK**
Execution Command **AT+CPAS**	Response TA returns the activity status of MT: **+CPAS: <pas>** **OK** Or **ERROR** If there is any error related to MT functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<pas>	Integer type.	
	0	Ready
	2	Unknown
	3	Ringing
	4	Call in progress or call hold
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CPAS
+CPAS: 0                                    // The module is ready to handle requests

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

OK
AT+CPAS
+CPAS: 3                                    //The module is ringing

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

OK
AT+CPAS
+CPAS: 4                                    //Call in progress

OK
```

4.2. AT+CEER Report Extended Error

This command queries an extended error and report the cause of the last failed operation, such as:

- The failure to release a call
- The failure to set up a call (both mobile originated or terminated)
- The failure to modify a call by using supplementary services
- The failure to activate, register, query, deactivate or deregister a supplementary service
- The failure to attach GPRS or the failure to activate a PDP context
- The failure to detach GPRS or the failure to deactivate a PDP context

The release cause **<text>** is a text to describe the cause information given by the network.

AT+CEER Report Extended Error	
Test command **AT+CEER=?**	Response **OK**
Execution command **AT+CEER**	Response **+CEER: <text>**

	OK Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<text>	String type. Release cause text. Reason for the last call failure to setup or release (listed in ***Chapter 11.8***). Both CS and PS domain call types are reported. Cause data is captured from Call Manager events and cached locally for later use by this command.
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3. AT+QCFG Configure Extended Settings

This command queries and configures various settings of UE.

AT+QCFG Configure Extended Settings	
Test Command **AT+QCFG=?**	Response **+QCFG: "gprsattach",(**list of supported **<attach_mode>**s**),(**list of supported **<effect>**s**)** **+QCFG: "nwscanmode",(**range of supported **<scan_mode>**s**)** **+QCFG: "nwscanseq",(**list of supported **<scanseq>**s**)** **+QCFG: "roamservice",(**list of supported **<roam_mode>**s**),(**list of supported **<effect>**s**)** **+QCFG: "servicedomain",(**range of supported **<service>**s**),(**list of supported **<effect>**s**)** **+QCFG: "band",(**list of supported **<bandval>**s**)** **+QCFG: "urc/ri/other",(**list of supported **<typeRI>**s**),(**range of supported **<pulse_duration>**s**),(**range of supported **<pulse_count>**s**)** **+QCFG: "urc/ri/ring",(**list of supported **<typeRI>**s**),(**range of supported **<pulse_duration>**s**),(**range of supported **<pulse_count>**s**)**

	+QCFG: "urc/ri/smsincoming",(list of supported **<typeRI>**s**),(**range of supported **<pulse_duration>**s**),(**range of supported **<pulse_count>**s**)** **+QCFG: "urcdelay",(**range of supported **<time>**s**)** **+QCFG: "urc/cache",(**list of supported **<enable>**s**)** **+QCFG: "risignaltype",(**list of supported **<RI_signal_type>**s**)** **+QCFG: "ledmode",**(list of supported **<led_mode>**s) **+QCFG: "pcmclk",**(list of supported **<PCM_clkout>**s) **+QCFG: "usbnet",**(list of supported **<net>**s) **+QCFG: "ppp/termframe",**(list of supported **<flag>**s) **+QCFG: "airplanecontrol",**(list of supported **<enable>**s) **+QCFG: "uart2ipr",(**list of supported **<ipr>**s**)** **+QCFG: "nat",(**list of supported **<nat>**s**)** **OK**
Maximum Response Time	300 ms

4.3.1. AT+QCFG="gprsattach" Configure GPRS Attach Mode

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

AT+QCFG="gprsattach" Configure GPRS Attach Mode	
Write Command **AT+QCFG="gprsattach"[,<attach_mode>[,<effect>]]**	Response If the optional parameters are omitted, query current configuration: **+QCFG: "gprsattach",<attach_mode>,<effect>** **OK** If any of the optional parameters is specified, configure the GPRS attach mode: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configurations will be saved automatically.

Parameter

<attach_mode>	Integer type. The mode to attach GRPS when UE is powered on. 0 Manual attach 1 Auto attach
<effect>	Integer format. When to take effect 0 Take effect after UE reboots (currently not supported) 1 Take effect immediately
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

This configuration will affect the supported network mode of the module.

4.3.2. AT+QCFG="nwscanmode" Configure Network Search Mode

This command specifies the network mode to be searched.

AT+QCFG="nwscanmode" Configure Network Search Mode	
Write Command **AT+QCFG="nwscanmode"[,<scan_mode>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "nwscanmode",<scan_mode>** **OK** If the optional parameter is specified, set the network mode to be searched: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<scan_mode>	Integer type. Network searching mode.

	0	Automatic
	1	GSM only
	2	WCDMA only
<err>	Error codes. See ***Chapter 11.5*** for details.	

NOTE

If the mode conflicts with the current configuration, an error will be returned.

4.3.3. AT+QCFG="nwscanseq" Configure Network Searching Sequence

This command specifies the sequence of searching network.

AT+QCFG="nwscanseq" Configure Network Searching Sequence	
Write Command **AT+QCFG="nwscanseq"[,<scanseq>]**	Response If the optional parameter is omitted, query current configuration: **+QCFG: "nwscanseq",<scanseq>** **OK** If the optional parameter is specified, specify the network searching sequence: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configurations will be saved automatically.

Parameter

<scanseq>	Integer type. Network searching sequence.	
	0	Automatic
	1	GSM only
	2	WCDMA only
	9	WCDMA/GSM
	11	GSM/WCDMA

<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

1. If the mode is changed, the configuration will take effect immediately. Otherwise, it takes effect only after the module is restarted.
2. If the mode conflicts with the current configuration, an error will be returned.

4.3.4. AT+QCFG="roamservice" Configure Roam Service

This command enables or disables the roam service.

AT+QCFG="roamservice"	Configure Roam Service
Write Command **AT+QCFG="roamservice"[,<roam_mode>[,<effect>]]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "roamservice",<roam_mode>,<effect>** **OK** If the optional parameters is specified, configure the mode of roam service: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<roam_mode>	Integer type. The mode of roam service. 0 Disable roam service 1 Enable roam service
<effect>	Integer type. When to take effect 0 Take effect after UE reboots (currently not supported) 1 Take effect immediately

<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.5. AT+QCFG="servicedomain" Configure Service Domain

This command specifies the registered service domain.

AT+QCFG="servicedomain" Configure Service Domain	
Write Command **AT+QCFG="servicedomain"[,<service>[,<effect>]]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "servicedomain",<service>,<effect>** **OK** If the optional parameter is specified, configure the service domain of UE: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<service>	Integer type. Service domain of UE 0 CS only 1 PS only 2 CS & PS
<effect>	Integer format. When to take effect 0 Take effect after UE reboots (currently not supported) 1 Take effect immediately
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.6. AT+QCFG="band" Configure Band

This command specifies the preferred frequency bands to be searched of UE.

AT+QCFG="band" Configure Band	
Write Command **AT+QCFG="band"[,<bandval>]**	Response If the optional parameter is omitted, query current configuration: **+QCFG: "band",<bandval>** **OK** If the optional parameter is specified, configure the preferred frequency bands to be searched: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<bandval>	A hexadecimal value that specifies the GSM and WCDMA frequency band. If it is set to 0, it means not to change GSM and WCDMA frequency band. (e.g.: 00000013=00000001(GSM900)+00000002(GSM1800)+00000010(WCDMA 2100) 00000000 No change 00000001 GSM900 00000002 GSM1800 00000010 WCDMA 2100 00000020 WCDMA 1900 00000040 WCDMA 850 00000080 WCDMA 900 0000FFFF Any frequency band
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

If setting a band that is not supported by the module, an error will be returned.

4.3.7. AT+QCFG="urc/ri/other" Specify RI Behavior When Other URCs are Presented

This command specifies the RI (ring indicator) behavior when other URCs are presented.

AT+QCFG="urc/ri/other" Specify RI Behavior When Other URCs are Presented	
Write Command **AT+QCFG="urc/ri/other"[,<typeRI>[,<pulse_duration>[,<pulse_count>]]]**	Response If the optional parameters are omitted, query the current configuration: **+QCFG: "urc/ri/other",<typeRI>,<pulse_duration>,<pulse_count>** **OK** If the optional parameters is specified, set the RI behavior when other URCs are presented: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<typeRI>	String type. RI behavior when URCs are presented "off" No change. Ring indicator keeps inactive. "pulse" Pulse. Pulse width determined by **<pulse_duration>**.
<pulse_duration>	Integer type. The width of pulse. This parameter is effect only when **<typeRI>** is "pulse". Range: 5–2000. Default value: 120. Unit: ms.
<pulse_count>	Integer type. The count of pulse. This parameter is only meaningful when **<typeRI>** is "pulse". The interval time between two pulses is equal to **<pulse_duration>**. Range: 1–5. Default value: 1. Unit: s.
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.8. AT+QCFG="urc/ri/ring" Ring Line Behavior of RING

The command specifies the behavior of ring line when RING is presented to indicate an incoming call.

AT+QCFG="urc/ri/ring" Ring Line Behavior of RING	
Write Command **AT+QCFG="urc/ri/ring"[,<typeRI>[,<pulse_duration>[,<pulse_count>]]]**	Response If the optional parameters are omitted, query the current configuration: **+QCFG: "urc/ri/ring",<typeRI>,<pulse_duration>,<pulse_count>** **OK** If any of the optional parameters is specified, specify the behavior of ring line when RING is presented to indicate an incoming call: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<typeRI>	String type. The behavior of the ring line when URCs are presented "off" No change. Ring line keeps inactive "pulse" Pulse. Pulse width determined by **<pulse_duration>**
<pulse_duration>	Integer type. The width of pulse. This parameter is only meaningful when **<typeRI>** is “pulse”. If this parameter is not needed, you can set it as null. Range: 5–2000. Default value: 120. Unit: ms.
<pulse_count>	Integer type. The count of pulse. This parameter is only meaningful when **<typeRI>** is “pulse”. The interval time between two pulse is equal to **<pulse_duration>**. Range: 1–5. Default value: 1
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.9. AT+QCFG="urc/ri/smsincoming" Ring Line Behavior of Incoming SMS

This command specifies the behavior of ring line when the incoming message URCs are presented. Related incoming message URCs list: **+CMTI, +CMT, +CDS**, **+CBM**.

AT+QCFG="urc/ri/smsincoming"	Ring Line Behavior of Incoming SMS
Write Command **AT+QCFG="urc/ri/smsincoming"[,<typeRI>[,<pulse_duration>[,<pulse_count>]]]**	Response If the optional parameters are omitted, query the current configuration: **+QCFG: "urc/ri/smsincoming",<typeRI>,<pulse_duration>,<pulse_count>** **OK** If the optional parameters are specified, specify the behavior of ring line of incoming SMS: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<typeRI>	String type. The behavior of the ring line when URCs are presented. "off" No change. Ring line keeps inactive "pulse" Pulse. Pulse width determined by **<pulse_duration>**
<pulse_duration>	Integer type. The width of pulse. This parameter is valid only when **<typeRI>** is "pulse". If this parameter is not needed, it can be set to null. Range: 5–2000. Default value: 120. Unit: ms.
<pulse_count>	Integer type. The count of pulse. This parameter is valid only when **<typeRI>** is "pulse". The interval time between two pulses is equal to **<pulse_duration>**. Range: 1–5. Default value: 1.
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.10. AT+QCFG="urcdelay" Set Delay Time of URC Indication

This command sets the delay time of URC indication from the time that ring indicator pulse starts.

AT+QCFG="urcdelay" Set Delay Time of URC Indication	
Write Command **AT+QCFG="urcdelay"[,<time>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "urcdelay",<time>** **OK** If the optional parameter is specified, set when the URC indication will be outputted: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<time>	Integer type. Set the delay time of URC indication when ring indicator pulse starts. RI behavior when URCs are presented. Range: 0–120. Unit: s. 0 No delay.
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.11. AT+QCFG="urc/cache" Enable/Disable URC Cache Function

AT+QCFG="urc/cache" Enable/Disable URC Cache Function	
Write Command **AT+QCFG="urc/cache"[,<enable>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "urc/cache",<enable>** **OK**

	If the optional parameter is specified, enable/disable URC cache function: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<enable>	Integer type. 0 Disable URC cache 1 Enable URC cache
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QCFG="urc/cache"
+QCFG: "urc/cache",0          //URC cache function is disabled

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

OK

//Make a call and send two messages to the module
AT+QCFG="urc/cache",0         //Disable URC cache
OK

RING                          //Output cached URC

NO CARRIER                    //Output cached URC

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

+CMTI: "ME",1                 //Output cached URC
```

```
AT+QCFG="urc/cache"
+QCFG: "urc/cache",0          //URC cache function is disabled

OK
```

4.3.12. AT+QCFG="risignaltype" RI Signal Output Carrier

This command specifies the RI (ring indicator) signal output carrier.

AT+QCFG="risignaltype" RI Signal Output Carrier	
Write Command **AT+QCFG="risignaltype",[<RI_signal_type>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "risignaltype",<RI_signal_type>** **OK** If the optional parameter is specified, configure the RI signal output carrier: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<RI_signal_type>	String type. RI signal output carrier.	
	"respective"	The ring indicator behaves on the port where URC is presented. For example, if a URC is presented on UART port, it is physical ring indicator. If the URC is presented on USB port, it is virtual ring indicator. If the URC is presented on USB AT port, and the port does not support ring indicator, then there will be no ring indicator. **AT+QURCCFG="urcport"** can get the port on which URC is presented.
	"physical"	No matter which port URC is presented on, URC only causes the behavior of physical ring indicator.

<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.13. AT+QCFG="ledmode" Configures the Output Mode of Network Status Light

This command configures the output mode of the network status light. Two output modes are currently supported.

AT+QCFG="ledmode" Configures the Output Mode of Network Status Light	
Write Command **AT+QCFG="ledmode"[,led_mode]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "ledmode",<led_mode>** **OK** If the optional parameter is specified, return: **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<led_mode>	Integer type. Output mode of the pin indicating the network status. 0 The indication methods are listed below: Network searching: LED is ON for 200 ms; LED is OFF for 1800 ms Idle: LED is ON for 1800 ms; LED is OFF for 200 ms Data transfer is ongoing: LED is ON for 125 ms; LED is OFF for 125 ms Voice calling: always ON 1 LED is ON when attaching to the network and OFF in other conditions.

4.3.14. AT+QCFG="pcmclk" Enable/disable PCM Clock Signal Output

This command enables or disables PCM clock output when there is no calling and audio play.

AT+QCFG="pcmclk" Enable/disable PCM Clock Signal Output	
Write Command **AT+QCFG="pcmclk"[,<PCM_clkout>]**	Response If the optional parameter is omitted, query the current configuration:

	+QCFG: "pcmclk",<PCM_clkout> **OK** If the optional parameter is specified, enable or disable PCM clock signal output: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will not be saved.

Parameter

<PCM_clkout>	Integer type. Enable/disable PCM clock signal output. 0 Disable PCM clock signal output 1 Enable PCM clock signal output
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

The output frequency is 2048 kHz by default. If you need to modify the output frequency, see the parameter **<clock>** setting in the **AT+QDAI** command.

4.3.15. AT+QCFG="usbnet" Configure the Network Card Type Interface

This command configures the network card type interface.

AT+QCFG ="usbnet" Configure the Network Card Type Interface	
Write Command **AT+QCFG="usbnet"[,<net>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "usbnet",<net>** **OK** If the configuration parameter is specified, configure the network card type interface

	OK Or **ERROR** If error is related to ME functionality: **+CME ERROR:<err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configuration will be saved automatically.

Parameter

<net>	Integer type. The protocol of net port. 1 ECM interface 3 RNIDS interface
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.16. AT+QCFG="ppp/termframe" Enable/Disable the PPP TERM Frame Sending

This command enables/disables the PPP TERM frame sending when PPP is hung up by module itself.

AT+QCFG="ppp/termframe" Enable/Disable the PPP TERM Frame Sending	
Write Command **AT+QCFG="ppp/termframe"[,<flag>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "ppp/termframe",<flag>** **OK** If the configuration parameter is specified, enable/disable the PPP TERM frame sending: **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR:<err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configuration will be saved automatically.

Parameter

<flag>	Integer type. 0 Disable TERM frame sending when hang up PPP by module itself. 1 Enable TERM frame sending when hang up PPP by module itself.
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

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

Example

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

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

OK
```

4.3.17. AT+QCFG="airplanecontrol" Turn On/Off the Wireless Disabling Feature

This command turns on/off the wireless disabling configuration.

AT+QCFG="airplanecontrol"	Turn On/Off the Wireless Disabling Feature
Write Command **AT+QCFG="airplanecontrol"[,<enable>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "airplanecontrol",<enable>,<status>** **OK** If the configuration parameter is specified, turn on/off the wireless disabling configuration: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms

Characteristics	The command takes effect immediately; The configuration will be saved automatically.

Parameter

<enable>	Integer type. Wireless Disable Configuration 0 Wireless Disable feature disabled 1 Wireless Disable feature enabled. Enter airplane mode when Wireless Disable pin turns to active and exit airplane mode when Wireless Disable pin turns to inactive. Unsolicited result code **+QIND: airplanestatus,<status>** when Wireless Disable pin status changes. Not allowed exit airplane mode by **AT+CFUN=1** command when Wireless Disable pin active.
<status>	Integer type, 0 Enter airplane mode 1 Exit airplane mode
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

1. Wireless Disable pin active is low level and inactive is high level for now.
2. See hardware design for more information about W_Disable pin.

Example

```
AT+QCFG="airplanecontrol"
+QCFG: "airplanecontrol",0,0      //Wireless Disable Configuration is 0, disabled

OK

//Active Wireless Disable pin
AT+QCFG="airplanecontrol",1       //Active Wireless Disable Configuration and take effect immediately.
OK

+QIND: airplanestatus,1           //Enter airplane mode because Wireless Disable pin is active
AT+CFUN?
+CFUN: 4                          //In airplane mode

OK

//Inactive Wireless Disable pin
+QIND: airplanestatus,0           //Exit airplane mode
AT+CFUN?
```

```
+CFUN: 1                        //In normal mode

OK

//Reboot modem
AT+QCFG="airplanecontrol"
+QCFG: "ariplanecontrol",1,0    //This setting still takes effect after reboot

OK

//Active Wireless Disable pin
+QIND: airplanestatus,1         //Enter airplane mode
AT+CFUN?
+CFUN: 4                        //In airplane mode

OK
```

4.3.18. AT+QCFG="uart2ipr" Configure Baud Rate

This command configures the baud rate of UART2.

AT+QCFG="uart2ipr" Configure Baud Rate	
Write Command **AT+QCFG="uart2ipr"[,<ipr>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "uart2ipr",<ipr>** **OK** If the optional parameter is specified, configure the baud rate of UART2: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configuration will be saved automatically.

Parameter

<ipr>	Integer type. Baud rate of UART2. 4800 9600 19200 38400 57600 115200 230400 460800 921600
<err>	Error codes. See ***Chapter 11.5*** for details.

4.3.19. AT+QCFG="nat" Configure Working Mode of NIC

This command configures the working mode of NIC.

AT+QCFG="nat" Configure Working Mode of NIC	
Write Command **AT+QCFG="nat"[,<nat>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "nat",<nat>** **OK** If the optional parameter is specified, configure the working mode of NIC: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after rebooting; The configuration will be saved automatically.

Parameter

<nat>	Integer type. The working mode of NIC. 0 Routing mode

	1 NIC mode
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QCFG="nat",1                    // Configure the working mode of NIC to NIC mode.
OK
```

4.4. AT+QINDCFG Control URC Indication

This command controls URC indication.

AT+QINDCFG Control URC Indication	
Test command **AT+QINDCFG=?**	Response **+QINDCFG: (**list of supported **<urctype>**s**),(**list of supported **<enable>**s**),(**list of supported **<savetonvram>**s**)** **OK**
Write command **AT+QINDCFG=<urctype>[,<enable>[,<savetonvram>]]**	Response If the optional parameters are omitted, query the current configuration: **+QINDCFG: <urctype>,<enable>** **OK** If any of the optional parameters are specified, set the URC indication configurations: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configurations will be saved after configuring **<savetonvram>**.

Parameter

<urctype>	String type. URC type
	"all" Main switch of all URCs. Default is ON.
	"csq" Indication of signal strength and channel bit error rate change (similar to **AT+CSQ**). Default is OFF. If this configuration is ON, present: **+QIND: "csq",<rssi>,<ber>**
	"datastatus" Indication of data service status. Default is OFF. If this configuration is ON, present: **+QIND: "datastatus",<suspended>,<reason>** **<reason>** is an integer type listed as below: 0 SUSPEND_NO_CAUSE 1 SUSPEND_BY_RAU_ATTACH 2 SUSPEND_BY_LAU 3 SUSPEND_BY_TAU 4 SUSPEND_BY_CS_SERVICE 5 SUSPEND_BY_DS_OPERATION 6 SUSPEND_BY_POWERUP
	"mode" Indication of network main mode and sub mode. Default is OFF. If this configuration is ON, present: **^MODE:<main_mode>,<sub_mode>** **<main_mode>** is an integer type listed as below: 0 SYSINFO_SYSTEMO_MODE_NO_SERVICE 1 SYSINFO_SYSTEMO_MODE_RESERVED_1 2 SYSINFO_SYSTEMO_MODE_RESERVED_2 3 SYSINFO_SYSTEMO_MODE_GSM_GPRS 5 SYSINFO_SYSTEMO_MODE_WCDMA **<sub_mode>** is an integer type listed as below: 0 SYSINFO_SYSTEMO_SUBMODE_NO_SERVICE 1 SYSINFO_SYSTEMO_SUBMODE_GSM 3 SYSINFO_SYSTEMO_SUBMODE_GSM_EGPRS 5 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSDPA 6 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSUPA 7 SYSINFO_SYSTEMO_SUBMODE_UTRAN_HSPA 8 SYSINFO_SYSTEMO_SUBMODE_UTRAN
	"smsfull" SMS storage full indication. Default is OFF. If this configuration is ON, present: **+QIND: "smsfull",<storage>**
	"smsincoming" Incoming message indication. Default is ON. Related URC list: **+CMTI**, **+CMT**, **+CDS**
	"act" Indication of network access technology change. Default is OFF. If this configuration is ON, present: **+QIND: "act",<actvalue>** **<actvalue>** is a string type. The values are listed as below: “GSM”

	"EGPRS" "WCDMA" "HSDPA" "HSUPA" "HSDPA&HSUPA" "UNKNOWN" The examples of URC are as below: **+QIND: "act","HSDPA&HSUPA"** **+QIND: "act","UNKNOWN"** The description of "act" is as below: 1. If module does not register on network, **<actvalue>** would be "UNKNOWN". 2. If this configuration is ON, the URC of "act" will be reported immediately. Only when the network access technology changes, a new URC will be reported.
<enable>	Integer type. URC indication is ON or OFF 0 OFF 1 ON
<savetonvram>	Integer type. Whether to save configuration into NV. 0 Not save 1 Save
<err>	Error codes. See ***Chapter 11.5*** for details.

4.5. Power Back-off Function Related Commands

4.5.1. AT+QPWRBACKOFF Configure Power Back-off Value for GSM/WCDMA Band

This command configures the back-off power value of GSM/WCDMA Band.

AT+QPWRBACKOFF	**Configure Power Back-off Value for GSM/WCDMA Band**
Test Command **AT+QPWRBACKOFF=?**	Response **+QPWRBACKOFF: (**list of supported **<band>**s**),(**range of supported **<power_value>**s**)** **OK**
Write Command **AT+QPWRBACKOFF=<band>[,<power_value>]**	Response If the optional parameter is omitted, query the current configuration: **+QPWRBACKOFF: <band>,<power_value>** **OK**

	If any of the optional parameters is specified, configure GSM/WCDMA band back-off power value: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Characteristics	The command takes effect after rebooting; The configurations will be saved automatically.

Parameter

<band>	String type. Bands supported by GSM/WCDMA are as follows: GSM: "GSM900" "GSM850" "GSM1800" "GSM1900" WCDMA: "B1" "B2" "B5" "B6" "B8"
<power_value>	Integer type. Power back-off value. Range: 0–20. Default value: 0. Unit: dBm.
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QPWRBACKOFF="GSM900",4          //Set the power back-off value of GSM900 to 4 dBm.
OK
AT+QPWRBACKOFF="WB1",2             //Set the power back-off value of WCDMA Band 1 to 2 dBm.
OK
AT+QPWRBACKOFF="GSM900"            //Query the power back-off value of GSM900.
+QPWRBACKOFF: GSM900,4

OK
AT+QPWRBACKOFF="WB1"               //Query the power back-off value of WCDMA Band 1.
+QPWRBACKOFF: WB1,2

OK
```

4.5.2. AT+QGRIP Enable/Disable Power Back-off Function

AT+QGRIP Enable/Disable Power Back-off Function	
Test Command **AT+QGRIP=?**	Response **+QGRIP: (**list of supported **<mode>**s**)** **OK**
Read Command **AT+QGRIP?**	Response **+QGRIP: <mode>** **OK**
Write Command **AT+QGRIP=<mode>**	Response **OK**
Characteristics	The command takes effect immediately; The configurations will be saved automatically.

Parameter

<mode>	Integer type 0 Disable power back-off function 1 Enable power back-off function
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QGRIP=1      //Enable power back-off
OK
AT+QGRIP=0      //Disable power back-off
OK
```

5 (U)SIM Related Commands

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

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

AT+CIMI Request International Mobile Subscriber Identity (IMSI)	
Test Command **AT+CIMI=?**	Response **OK**
Execution Command **AT+CIMI**	Response **<IMSI>** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<IMSI>	String type. International Mobile Subscriber Identity (string without double quotes)
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CIMI
460023210226023                    //Query IMSI number of (U)SIM which is attached to ME

OK
```

5.2. AT+CLCK Facility Lock

This command locks, unlocks or interrogates a MT or a network facility **<fac>**. It can be aborted when network facilities are being set or interrogated. Password is normally needed to do such actions. When querying the status of network service (**<mode>**=2) the response line for 'not active' case (**<status>**=0) should be returned only if service is not active for any **<class>**. The factory default password of PF, PN, PU, PP and PC lock is "12341234".

AT+CLCK Facility Lock	
Test Command **AT+CLCK=?**	Response **+CLCK: (**list of supported **<fac>**s**)** **OK**
Write Command **AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]**	Response If **<mode>** is not equal to 2 and the command is set successfully: **OK** If **<mode>**=2 and command is set successfully: **+CLCK: <status>[,<class>]** **[+CLCK: <status>[,<class>]]** **[…]** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	5 s
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<fac>	String type.	
	"SC"	(U)SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued).
	"AO"	BAOC (Bar All Outgoing Calls) (see *3GPP TS 22.088 clause 1*).
	"OI"	BOIC (Bar Outgoing International Calls) (see *3GPP TS 22.088 clause 1*).
	"OX"	BOIC-exHC (Bar Outgoing International Calls except to Home Country) (see

		3GPP TS 22.088 clause 1).
	"AI"	BAIC (Bar All Incoming Calls) (see *3GPP TS 22.088 clause 2*).
	"IR"	BIC-Roam (Bar Incoming Calls when Roaming outside the home country) (see *3GPP TS 22.088 clause 2*).
	"AB"	All Barring services (see *3GPP TS 22.030*) (applicable only for **<mode>**=0).
	"AG"	All outgoing barring services (see *3GPP TS 22.030*) (applicable only for **<mode>**=0).
	"AC"	All incoming barring services (see *3GPP TS 22.030*) (applicable only for **<mode>**=0).
	"FD"	SIM card or active application in the UICC (GSM or USIM) fixed dialing memory feature (If PIN2 authentication has not been done during the current session, PIN2 is required as **<passwd>**).
	"PF"	Lock Phone to the very first inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other SIM/UICC cards are inserted).
	"PN"	Network Personalization (see *3GPP TS 22.022*).
	"PU"	Network Subset Personalization (see *3GPP TS 22.022*).
	"PP"	Service Provider Personalization (see *3GPP TS 22.022*).
	"PC"	Corporate Personalization (see *3GPP TS 22.022*).
<mode>	Integer type.	
	0	Unlock
	1	Lock
	2	Query status
<passwd>	String type. Password	
<class>	Integer type.	
	1	Voice
	2	Data
	4	FAX
	7	All telephony except SMS
	8	Short message service
	16	Data circuit synchronization
	32	Data circuit asynchronization
<status>	Integer type.	
	0	Not active
	1	Active
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CLCK="SC",2                  //Query the status of (U)SIM card
+CLCK: 0                        //The (U)SIM card is unlocked (OFF)

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

```
OK
AT+CLCK="SC",2                    //Query the status of (U)SIM card
+CLCK: 1                          //The (U)SIM card is locked (ON)

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

5.3. AT+CPIN Enter PIN

This command enters a password or queries whether or not the module requires a password which is necessary before it can be operated. The password may be (U)SIM PIN, (U)SIM PUK, PH-SIM PIN, etc. If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken and an error message **+CME ERROR** is returned to TE.

If the PIN required is (U)SIM PUK or (U)SIM PUK2, the second pin **<newpin>** is required. This second pin is used to replace the old pin in the (U)SIM.

AT+CPIN Enter PIN	
Test Command **AT+CPIN=?**	Response **OK**
Read Command **AT+CPIN?**	Response TA returns an alphanumeric string indicating whether or not some password is required. **+CPIN: <code>** **OK**
Write Command **AT+CPIN=<pin>[,<newpin>]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	5 s
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<code>	String type.

	READY	MT is not pending for any password
	SIM PIN	MT is waiting for (U)SIM PIN to be given
	SIM PUK	MT is waiting for (U)SIM PUK to be given
	SIM PIN2	MT is waiting for (U)SIM PIN2 to be given
	SIM PUK2	MT is waiting for (U)SIM PUK2 to be given
	PH-NET PIN	MT is waiting for network personalization password to be given
	PH-NET PUK	MT is waiting for network personalization unblocking password to be given
	PH-NETSUB PIN	MT is waiting for network subset personalization password to be given
	PH-NETSUB PUK	MT is waiting for network subset personalization unblocking password to be given
	PH-SP PIN	MT is waiting for service provider personalization password to be given
	PH-SP PUK	MT is waiting for service provider personalization unblocking password to be given
	PH-CORP PIN	MT is waiting for corporate personalization password to be given
	PH-CORP PUK	MT is waiting for corporate personalization unblocking password to be given
<pin>	String type. Password. If the requested password is a PUK, such as (U)SIM PUK1, PH-FSIM PUK or another passwords, then **<pin>** must be followed by **<newpin>**.	
<newpin>	String type. A new password required if the requested code is a PUK.	
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
//Enter PIN
AT+CPIN?
+CPIN: SIM PIN                    //Query PIN code is locked

OK
AT+CPIN=1234                      //Enter PIN
OK

+CPIN: READY
AT+CPIN?                          //PIN has already been entered
+CPIN: READY

OK
//Enter PUK and PIN
AT+CPIN?
+CPIN: SIM PUK                    //Query PUK code is locked

OK
```

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

+CPIN: READY
AT+CPIN?
+CPIN: READY                       //PUK has already been entered

OK
```

5.4. AT+CPWD Change Password

This command sets a new password for the facility lock function defined by **AT+CLCK**. This Test Command returns a list of pairs which present the available facilities and the maximum length of their password.

AT+CPWD Change Password	
Test Command **AT+CPWD=?**	Response **+CPWD: (**list of supported **<fac>**s**),<pwdlength>** **OK**
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	5 s
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<fac>	String type.	
	“SC”	(U)SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command is issued)
	“AO”	BAOC (Bar All Outgoing Calls, see *3GPP TS 22.088 clause 1*)
	“OI”	BOIC (Bar Outgoing International Calls, see *3GPP TS 22.088 clause 1*)
	“OX”	BOIC-exHC (Bar Outgoing International Calls except to Home Country, see to *3GPP TS 22.088 clause 1*)
	“AI”	BAIC (Bar All Incoming Calls, see *3GPP TS 22.088 clause 2*)
	“IR”	BIC-Roam (Bar Incoming Calls when Roaming outside the home country,

		see *3GPP TS 22.088 clause 2*)
	“AB”	All barring services (see *3GPP TS 22.030*, applicable only for **<mode>**=0)
	“AG”	All outgoing barring services (see *3GPP TS 22.030*, applicable only for **<mode>**=0)
	“AC	All incoming barring services (see *3GPP TS 22.030*, applicable only for **<mode>**=0)
	“P2”	(U)SIM PIN2
<pwdlength>	Integer type. Maximum length of password.	
<oldpwd>	String type. Password specified for the facility from the user interface or with command.	
<newpwd>	String type. New password.	
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CPIN?
+CPIN: READY

OK
AT+CPWD="SC","1234","4321"          //Change (U)SIM card password to “4321”
OK
//Restart the module or re-activate the (U)SIM card
AT+CPIN?                            //Query PIN code is locked
+CPIN: SIM PIN

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

+CPIN: READY
```

5.5. AT+CSIM Generic (U)SIM Access

This command allows a direct control of the (U)SIM that is installed in the currently selected card slot by a distant application on the TE. The TE shall then keep the processing of (U)SIM information within the frame specified by GSM/UMTS.

AT+CSIM Generic (U)SIM Access	
Test Command **AT+CSIM=?**	Response **OK**
Write Command **AT+CSIM=<length>,<command>**	Response **+CSIM: <length>,<response>**

	OK Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<length>	Integer type. Length of **<command>** or **<response>** string.
<command>	Command passed on by the MT to the (U)SIM in the format as described in *3GPP TS 51.011*.
<response>	Response to the command transferred by the (U)SIM to the MT in the format as described in *3GPP TS 51.011*.
<err>	Error codes. See ***Chapter 11.5*** for details.

5.6. AT+CRSM Restricted (U)SIM Access

This command offers easy but limited access to the (U)SIM database. It transmits the (U)SIM command number **<command>** and its required parameters to the MT.

AT+CRSM Restricted (U)SIM Access	
Test Command **AT+CRSM=?**	Response **OK**
Write Command **AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>][,<pathid>]]]**	Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms

Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<command>	Integer type. (U)SIM command number 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS
<fileid>	Integer type. Identifier for an elementary data file on (U)SIM, if used by **<command>**.
<P1>, **<P2>**, **<P3>**	Integer type. Parameters transferred by the MT to the (U)SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in *3GPP TS 51.011*.
<data>	Information which shall be written to the (U)SIM (hexadecimal character format; see **AT+CSCS**).
<pathid>	The directory path of an elementary file on a UICC in hexadecimal format.
<sw1>, **<sw2>**	Integer type. Information from the (U)SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command.
<response>	Response of a successful completion of the command previously issued (hexadecimal character format; see **AT+CSCS**). STATUS and GET RESPONSE return data, which gives information about the current elementary data field. The information includes the type of file and its size (see *3GPP TS 51.011*). 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.
<err>	Error codes. See ***Chapter 11.5*** for details.

5.7. AT+QCCID Show ICCID

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

AT+QCCID Show ICCID	
Test Command **AT+QCCID=?**	Response **OK**

Execution Command **AT+QCCID**	Response **+QCCID: <ICCID>** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<ICCID>	Integer type. ICCID (Integrated Circuit Card Identifier) number of the (U)SIM card

Example

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

OK
```

5.8. AT+QPINC Display PIN Remainder Counter

This command queries the number of attempts left to enter the password of (U)SIM PIN/PUK.

AT+ QPINC Display PIN Remainder Counter	
Test Command **AT+QPINC=?**	Response **+QPINC: (**list of supported **<facility>**s**)** **OK**
Read Command **AT+QPINC?**	Response **+QPINC: "SC",<PIN_counter>,<PUK_counter>** **+QPINC: "P2",<PIN_counter>,<PUK_counter>** **OK**
Write Command **AT+QPINC=<facility>**	Response **+QPINC: <facility>,<PIN_counter>,<PUK_counter>** **OK** Or **ERROR**

	If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<facility>	String type. "SC" (U)SIM PIN "P2" (U)SIM PIN2
<PIN_counter>	Integer type. Number of attempts left to enter the password of PIN. Range: 0–3.
<PUK_counter>	Integer type. Number of attempts left to enter the password of PUK. Range: 0–10.
<err>	Error codes. See ***Chapter 11.5*** for details.

5.9. AT+QINISTAT Query Initialization Status of (U)SIM Card

This command queries the initialization status of (U)SIM card.

AT+QINISTAT Query Initialization Status of (U)SIM Card	
Test Command **AT+QINISTAT=?**	Response **+QINISTAT: (**range of supported **<status>**s**)** **OK**
Execution Command **AT+QINISTAT**	Response **+QINISTAT: <status>** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<status>	Integer type. Initialization status of (U)SIM card. Actual value is the sum of several of the following four kinds (e.g. 7=1+2+4 means CPIN READY & SMS DONE & PB DONE). 0 Initial state 1 CPIN READY. Operation like lock/unlock PIN is allowed 2 SMS initialization completed 4 Phonebook initialization completed

5.10. AT+QSIMDET (U)SIM Card Detection

This command enables (U)SIM card hot-swap function. (U)SIM card is detected by GPIO interrupt. The level of (U)SIM card detection pin should also be set when the (U)SIM card is inserted.

AT+ QSIMDET (U)SIM Card Detection	
Test Command **AT+QSIMDET=?**	Response **+QSIMDET: (**list of supported **<enable>**s**),(**list of supported **<insert_level>**s**)** **OK**
Read Command **AT+QSIMDET?**	Response **+QSIMDET: <enable>,<insert_level>** **OK**
Write Command **AT+QSIMDET=<enable>,<insert_level>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration will be saved automatically.

Parameter

<enable>	Integer type. Enable or disable (U)SIM card detection 0 Disable 1 Enable
<insert_level>	Integer type. The level of (U)SIM detection pin when a (U)SIM card is inserted 0 Low level 1 High level

NOTE

Hot-swap function is invalid if the configured value of **<insert_level>** is inconsistent with hardware design.

Example

```
AT+QSIMDET=1,0          //Set (U)SIM card detection pin level as low when (U)SIM card is inserted
OK
<Remove (U)SIM card>
```

+CPIN: NOT READY
<Insert (U)SIM card>
+CPIN: READY //If PIN1 of the (U)SIM card is unlocked

5.11. AT+QSIMSTAT (U)SIM Card Insertion Status Report

This command queries (U)SIM card insertion status or determines whether (U)SIM card insertion status report is enabled.

AT+QSIMSTAT (U)SIM Card Insertion Status Report	
Test Command **AT+QSIMSTAT=?**	Response **+QSIMSTAT: (**list of supported **<enable>**s**)** **OK**
Read Command **AT+QSIMSTAT?**	Response **+QSIMSTAT: <enable>,<inserted_status>** **OK**
Write Command **AT+QSIMSTAT=<enable>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration will be saved automatically.

Parameter

<enable>	Integer type. Enable or disable (U)SIM card insertion status report. If it is enabled, when (U)SIM card is removed or inserted, the URC **+QSIMSTAT: <enable>,<inserted_status>** will be reported. 0 Disable 1 Enable
<inserted_status>	Integer type. (U)SIM card is inserted or removed. This parameter is not allowed to be set. 0 Removed 1 Inserted 2 Unknown, before (U)SIM initialization

Example

```
AT+QSIMSTAT?                    //Query (U)SIM card insertion status
+QSIMSTAT: 0,1

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

OK
<Remove (U)SIM card>
+QSIMSTAT : 1,0                 //Report of (U)SIM card insertion status, removed

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

OK
<Insert (U)SIM card>
+QSIMSTAT: 1,1                  //Report of (U)SIM card insertion status, inserted

+CPIN: READY
```

6 Network Service Commands

6.1. AT+COPS Operator Selection

This command returns the current operators and their status, and allows setting automatic or manual network selection.

This Write Command forces an attempt to select and register the GSM/UMTS network operator. If the selected operator is not available, no other operator shall be selected (except **<mode>**=4). The format of selected operator name shall apply to further Read Command (**AT+COPS?**).

This Test Command returns a set of five parameters, each representing an operator presenting in the network. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in the order of: home network, networks referenced in (U)SIM and other networks.

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

AT+COPS Operator Selection	
Test Command **AT+COPS=?**	Response **+COPS: [**list of supported **(<stat>,**long alphanumeric **<oper>,**short alphanumeric **<oper>,**numeric **<oper>[,<AcT>])**s**][,,(**list of supported **<mode>s),(**list of supported **<format>**s**)]** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Read Command **AT+COPS?**	Response **+COPS: <mode>[,<format>[,<oper>][,<AcT>]]** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Write Command	Response

AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]	**OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	180 s, determined by network.
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<stat>	Integer type. 0 Unknown 1 Operator available 2 Current operator 3 Operator forbidden
<oper>	String type. Operator in format as per **<format>**. **<format>** indicates if the format is alphanumeric or numeric
<mode>	Integer type. 0 Automatic mode. **<oper>** field is ignored 1 Manual operator selection. **<oper>** field shall be present and **<AcT>** optionally 2 Manually deregister from network 3 Set only **<format>** (for **AT+COPS?** Read Command), and do not attempt registration/deregistration (**<oper>** and **<AcT>** fields are ignored). This value is invalid in the response of Read Command. 4 Manual/automatic selection. **<oper>** field shall be presented. If manual selection fails, automatic mode (**<mode>**=0) is entered
<format>	Integer type. 0 Long format alphanumeric **<oper>** which can be up to 16 characters 1 Short format alphanumeric **<oper>** 2 Numeric **<oper>**. GSM location area identification number
<AcT>	Integer type. Access technology selected. Values 3, 4, 5 and 6 occur only in the response of Read Command while MS is in data service state and is not intended for the **AT+COPS** Write Command. 0 GSM 2 UTRAN 3 GSM W/EGPRS 4 UTRAN W/HSDPA 5 UTRAN W/HSUPA 6 UTRAN W/HSDPA and HSUPA 7 E-UTRAN 8 UTRAN HSPA+

<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+COPS=?                                   //List all current network operators
+COPS: (2,"CHN-UNICOM","UNICOM","46001",2),(1,"CHN-UNICOM","UNICOM","46001",0),(3,"CHINA MOBILE","CMCC","46000",0),,(0–4),(0–2)

OK
AT+COPS?                                    //Query the currently selected network operator
+COPS: 0,0,"CHN-UNICOM",6

OK
```

6.2. AT+CREG CS Domain Network Registration Status

This Read Command returns the CS domain network registration status. It returns the status of result code presentation and an integer **<stat>** which shows whether the network has currently indicated the registration of the ME. Location information elements **<lac>** and **<ci>** are returned only when **<n>**=2 and ME is registered on the network.

The Write Command sets whether to present URC or not. It controls the presentation of an unsolicited result code **+CREG: <stat>** when **<n>**=1 and there is a change in the ME network registration status.

AT+CREG CS Domain Network Registration Status	
Test Command **AT+CREG=?**	Response **+CREG: (**range of supported **<n>**s**)** **OK**
Read Command **AT+CREG?**	Response **+CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]]** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Write Command **AT+CREG[=<n>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved (should execute AT&W after

	this command is issued).
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type.	
	0	Disable network registration unsolicited result code
	1	Enable network registration unsolicited result code: **+CREG: <stat>**
	2	Enable network registration unsolicited result code with location information: **+CREG: <stat>[,<lac>,<ci>[,<AcT>]]**
<stat>	Integer type.	
	0	Not registered. ME is not currently searching a new operator to register to
	1	Registered, home network
	2	Not registered, but ME is currently searching a new operator to register to
	3	Registration denied
	4	Unknown
	5	Registered, roaming
<lac>	String type. Two bytes location area code in hexadecimal format	
<ci>	String type. 16-bit (GSM) or 28-bit (UMTS/LTE) cell ID in hexadecimal format	
<AcT>	Integer type. Access technology selected	
	0	GSM
	2	UTRAN
	3	GSM W/EGPRS
	4	UTRAN W/HSDPA
	5	UTRAN W/HSUPA
	6	UTRAN W/HSDPA and HSUPA
	7	E-UTRAN
	8	UTRAN HSPA+
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

```
AT+CREG=1
OK

+CREG: 1                                  //URC reports that ME has registered on network
AT+CREG=2                                 //Activate extended URC mode
OK

+CREG: 1,"D5D6","8062AF0",6               //URC reports that operator has found location area code
                                            and cell ID
```

6.3. AT+CSQ Signal Quality Report

This command indicates the received signal strength **<rssi>** and the channel bit error rate **<ber>**.

This Execution Command returns received signal strength indication **<rssi>** and channel bit error rate **<ber>** from the ME.

This Test Command returns values supported as compound values.

AT+CSQ Signal Quality Report	
Test Command **AT+CSQ=?**	Response **+CSQ: (**list of supported **<rssi>**s**),(**list of supported **<ber>**s**)** **OK**
Execution Command **AT+CSQ**	Response **+CSQ: <rssi>,<ber>** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<rssi>	Integer type.	
	0	-113 dBm or less
	1	-111 dBm
	2–30	-109 dBm to -53 dBm
	31	-51 dBm or greater
	99	Not known or not detectable
<ber>	Integer type. Channel bit error rate (in percent)	
	0–7	As RXQUAL values in the table in *3GPP TS 45.008 subclause 8.2.4*
	99	Not known or not detectable
<err>	Error codes. See ***Chapter 11.5*** for details.	

Example

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

OK
AT+CSQ
+CSQ: 28,99          //The current signal strength indication is 28 and channel bit error rate is 99

OK
```

NOTE

After using network related commands such as **AT+CCWA** and **AT+CCFC**, it is recommended to wait for 3 seconds before entering **AT+CSQ** so as to ensure that any network access required for the preceding command has been finished.

6.4. AT+CPOL Preferred Operator List

This command edits and queries the list of preferred operators.

AT+CPOL Preferred Operator List	
Test Command **AT+CPOL=?**	Response **+CPOL: (**list of supported **<index>**s**),(**range of supported **<format>**s**)** **OK**
Read Command **AT+CPOL?**	Response **+CPOL: <index>,<format>,<oper>[,<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>,<HSPA+>,<E-UTRAN+>]** **[+CPOL: <index>,<format>,<oper>[,<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>,<HSPA+>,<E-UTRAN+>]** **[…]** **OK**
Write Command **AT+CPOL=<index>[,<format>[,<oper>[<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**

Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<index>	Integer type. The order number of operator in the (U)SIM preferred operator list
<format>	Integer type. 0 Long format alphanumeric **<oper>** 1 Short format alphanumeric **<oper>** 2 Numeric **<oper>**
<oper>	String type. **<format>** indicates the format is alphanumeric or numeric (see **AT+COPS**). If **<index>** is given but the **<oper>** is left out, the entry is deleted.
<GSM>	Integer type. GSM access technology 0 Access technology is not selected 1 Access technology is selected
<GSM_compact>	Integer type. GSM compact access technology 0 Access technology is not selected 1 Access technology is selected
<UTRAN>	Integer type. UTRAN access technology 0 Access technology is not selected 1 Access technology is selected
<E-UTRAN>	Integer type. E-UTRAN access technology 0 Access technology is not selected 1 Access technology is selected
<HSPA+>	Integer type. HSPA+ access technology 0 Access technology is not selected 1 Access technology is selected
<E-UTRAN+>	Integer type. E-UTRAN+ access technology 0 Access technology is not selected 1 Access technology is selected
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

The access technology selection parameters **<GSM>**, **<GSM_compact>**, **<UTRAN>** and **<E-UTRAN>** are required for SIM cards or UICC's containing PLMN selector with access technology.

6.5. AT+COPN Read Operator Names

This command returns the list of operator names from the ME. Each operator code **<numericn>** that has an alphanumeric equivalent **<alphan>** in the ME memory is returned.

AT+COPN Read Operator Names	
Test Command **AT+COPN=?**	Response **OK**
Execution Command **AT+COPN**	Response **+COPN: <numeric1>,<alpha1>** **[+COPN: <numeric2>,<alpha2>** **[…]]** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	Depends on the number of operator names.
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<numericn>	String type. Operator in numeric format (see **AT+COPS**)
<alphan>	String type. Operator in long alphanumeric format (see **AT+COPS**)
<err>	Error codes. See ***Chapter 11.5*** for details.

6.6. AT+CTZU Automatic Time Zone Update

This Write Command enables and disables automatic time zone update via NITZ.

AT+CTZU Automatic Time Zone Update	
Test Command **AT+CTZU=?**	Response **+CTZU: (**list of supported **<onoff>**s**)** **OK**
Write Command **AT+CTZU=<onoff>**	Response **OK**

	Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Read Command **AT+CTZU?**	Response **+CTZU: <onoff>** **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<onoff>	Integer type. The mode of automatic time zone update. 0 Disable automatic time zone update via NITZ. 1 Enable automatic time zone update via NITZ and update GMT time to RTC 3 Enable automatic time zone update via NITZ and update LOCAL time to RTC
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CTZU?
+CTZU: 1

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

OK
AT+CTZU=0
OK
AT+CTZU?
+CTZU: 0

OK
```

6.7. AT+CTZR Time Zone Reporting

This command controls the time zone reporting of changed event. If reporting is enabled, the MT returns the unsolicited result code **+CTZV: <tz>** or **+CTZE: <tz>,<dst>,<time>** whenever the time zone is changed. The configuration is stored to NV automatically.

AT+CTZR Time Zone Reporting	
Test Command **AT+CTZR=?**	Response **+CTZR: (**range of supported **<reporting>**s**)** **OK**
Write Command **AT+CTZR=<reporting>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Read Command **AT+CTZR?**	Response **+CTZR: <reporting>** **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<reporting>	Integer type. The mode of time zone reporting 0 Disable time zone reporting of changed event 1 Enable time zone reporting of changed event by unsolicited result code: **+CTZV: <tz>** 2 Enable extended time zone reporting by unsolicited result code: **+CTZE: <tz>,<dst>,<time>**
<tz>	String type. The sum of the local time zone (difference between the local time and GMT is expressed in quarters of an hour) plus daylight saving time. The format is “±zz”, expressed as a fixed width, two-digit integer with the range -48 to +56. To maintain a fixed width, numbers in the range -9 to +9 are expressed with a leading zero, e.g. “-09”, “+00” and “+09”.
<dst>	Integer type. Indicates whether **<tz>** includes daylight savings adjustment

	0 **<tz>** includes no adjustment for daylight saving time 1 **<tz>** includes +1 hour (equals 4 quarters in **<tz>**) adjustment for daylight saving time 2 **<tz>** includes +2 hours (equals 8 quarters in **<tz>**) adjustment for daylight saving time
<time>	String type. The local time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). This parameter can be provided by the network when delivering time zone information and will be presented in the unsolicited result code of extended time zone reporting if provided by the network.
<err>	See ***Chapter 11.5*** for details.

Example

```
AT+CTZR=2
OK
AT+CTZR?
+CTZR: 2

OK

+CTZE: "+32",0,"2019/10/15,06:51:13"          //<reporting> is 2
```

6.8. AT+QLTS Obtain the Latest Time Synchronized Through Network

This command obtains the latest time synchronized through network.

AT+QLTS Obtain the Latest Time Synchronized Through Network	
Test Command **AT+QLTS=?**	Response **+QLTS: (**range of supported **<mode>**s**)** **OK**
Execution Command **AT+QLTS**	Response **+QLTS: <time>,<dst>** **OK**
Write Command **AT+QLTS=<mode>**	Response **+QLTS: <time>,<dst>** **OK** Or **ERROR**

	If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<mode>	Integer type. Query network time mode 0 Query the latest time that has been synchronized through network 1 Query the current GMT time calculated from the latest time that has been synchronized through network 2 Query the current LOCAL time calculated from the latest time that has been synchronized through network
<time>	String type. Format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -48 to +48). e.g. 6th of May 2004, 22:10:00 GMT+2 hours equals to “04/05/06,22:10:00+08”
<dst>	Daylight saving time.
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

If the time has not been synchronized through network, the command will return a null time string: **+QLTS: ""**

Example

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

OK
AT+QLTS                    //Query the latest time synchronized through network
+QLTS: "2019/10/11,03:40:48+32,0"
OK
AT+QLTS=0                  //Query the latest time synchronized through network. It offers the same
                             function as Execution Command AT+QLTS.
+QLTS: "2019/10/11,03:40:48+32,0"

OK
AT+QLTS=1                  //Query the current GMT time calculated from the latest time that has been
                             synchronized through network
+QLTS: "2019/10/11,03:41:22+32,0"
```

```
OK
AT+QLTS=2                    //Query the current LOCAL time calculated from the latest time that has been
                               synchronized through network
+QLTS: "2019/10/11,11:41:23+32,0"

OK
```

6.9. AT+QNWINFO Query Network Information

This command indicates network information such as the selected access technology, the operator and the selected band.

AT+QNWINFO Query Network Information	
Test Command **AT+QNWINFO=?**	Response **OK**
Execution Command **AT+QNWINFO**	Response **+QNWINFO: <AcT>,<oper>,<band>,<channel>** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<AcT>	String type. The selected access technology “NONE” “GSM” “GPRS” “EDGE” “WCDMA” “HSDPA” “HSUPA” “HSPA+”
<oper>	String type. The operator in numeric format
<band>	String type. The selected band “GSM 1800” “GSM 900” “WCDMA 2100” “WCDMA 850” “WCDMA 900”

<channel>	Integer type. Channel ID

Example

```
AT+QNWINFO=?
OK
AT+QNWINFO
+QNWINFO: "HSDPA","46001","WCDMA 2100",10663

OK
```

7 Phonebook Commands

7.1. AT+CNUM Subscriber Number

This command gets the subscribers own number(s) from the (U)SIM.

AT+CNUM Subscriber Number	
Test Command **AT+CNUM=?**	Response **OK**
Execution Command **AT+CNUM**	Response **[+CNUM: [<alpha>],<number>,<type>]** **[+CNUM: [<alpha>],<number>,<type>]** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP 27.007	

Parameter

<alpha>	Optional alphanumeric string associated with **<number>**. The used character set should be the one selected with **AT+CSCS** command
<number>	String type. Phone number in format specified by **<type>**
<type>	Integer type. Type of address of octet (see *3GPP TS 24.008 subclause 10.5.4.7* for details). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character "+") 161 National type
<err>	Error codes. See ***Chapter 11.5*** for details.

7.2. AT+CPBF Find Phonebook Entries

This command searches the phonebook entries starting with the given **<findtext>** string from the current phonebook memory storage selected with **AT+CPBS**, and return all found entries sorted in alphanumeric order.

AT+CPBF Find Phonebook Entries	
Test Command **AT+CPBF=?**	Response **+CPBF: <nlength>,<tlength>** **OK**
Write Command **AT+CPBF=<findtext>**	Response **[+CPBF: <index>,<number>,<type>,<text>]** **[…]** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	Depends on the storage of phonebook entries.
Characteristics	/
Reference 3GPP 27.007	

Parameter

<nlength>	Integer type. Indicates the maximum length of field **<number>**.
<tlength>	Integer type. Indicates the maximum length of field **<text>**.
<findtext>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<index>	Integer type. Value in the range of of location numbers of phone book memory.
<number>	String type. The phone number in format specified by **<type>**.
<type>	Integer type. Type of address of octet (see *3GPP TS 24.008 subclause 10.5.4.7* for details). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character “+”) 161 National type
<text>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.

<err>	See ***Chapter 11.5*** for details.

7.3. AT+CPBR Read Phonebook Entries

This command returns phonebook entries in location number range **<index1>... <index2>** from the current phonebook memory storage selected with **AT+CPBS**. If **<index2>** is left out, only location **<index1>** is returned.

AT+CPBR Read Phonebook Entries	
Test Command **AT+CPBR=?**	Response **+CPBR: (**list of supported **<index>**s**),<nlength>,<tlength>** **OK**
Write Command **AT+CPBR=<index1>[,<index2>]**	Response **+CPBR: <index1>,<number>,<type>,<text>** **[+CPBR: <index2>,<number>,<type>,<text>** **[…]]** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	Depends on the storage of phonebook entries.
Characteristics	/
Reference 3GPP 27.007	

Parameter

<index>	Integer type. Value in the range of of location numbers of phonebook memory.
<number>	String type. Phone number in format specified by **<type>**.
<nlength>	Integer type. Indicates the maximum length of field **<number>**.
<tlength>	Integer type. Indicates the maximum length of field **<text>**.
<index1>	Integer type. The first phonebook record to read.
<index2>	Integer type. The last phonebook record to read.
<type>	Integer type. Type of address of octet (see *3GPP TS 24.008 subclause 10.5.4.7* for details). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character “+”)

	161 National type
<text>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<err>	Error codes. See ***Chapter 11.5*** for details.

7.4. AT+CPBS Select Phonebook Memory Storage

This command selects phonebook memory storage, which is used by other phonebook commands. The Read Command returns currently selected memory, the number of used locations and the total number of locations in the memory when supported by manufacturer. The Test Command returns supported storages as compound value.

AT+CPBS Select Phonebook Memory Storage	
Test Command **AT+CPBS=?**	Response **+CPBS: (**list of supported **<storage>**s**)** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Read Command **AT+CPBS?**	Response **+CPBS: <storage>,<used>,<total>** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Write Command **AT+CPBS=<storage>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Reference 3GPP 27.007	

Parameter

<storage>	String type. "SM" (U)SIM phonebook "DC" ME dialed calls list (**AT+CPBW** may not be applicable to this storage) "FD" (U)SIM fix dialing-phone book (**AT+CPBW** operation need the authority of PIN2) "LD" (U)SIM last-dialing-phone book (**AT+CPBW** may not be applicable to this storage) "ON" (U)SIM own numbers (MSISDNs) list "AP" Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DFPHONEBOOK under ADF USIM is selected. "SDN" Service Dialing Number
<used>	Integer type. Indicates the total number of used locations in selected memory
<total>	Integer type. Indicates the total number of locations in selected memory
<err>	Error codes. See ***Chapter 11.5*** for details.

7.5. AT+CPBW Write Phonebook Entry

This command writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **AT+CPBS**. It can also delete a phonebook entry in location number **<index>**.

AT+CPBW Write Phonebook Entry	
Test Command **AT+CPBW=?**	Response **+CPBW: (**range of supported **<index>**s**),<nlength>,(**list of supported **<type>**s**),<tlength>** **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Write Command **AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality:

	+CME ERROR: <err>
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP 27.007	

Parameter

<index>	Integer type. Value in the range of of location numbers of phone book memory. If **<index>** is not given, the first free entry will be used. If **<index>** is given as the only parameter, the phonebook entry specified by location is deleted.
<number>	String type. Phone number in format specified by **<type>**.
<nlength>	Integer type. Indicates the maximum length of field **<number>**.
<tlength>	Integer type. Indicates the maximum length of field **<text>**.
<type>	Integer type. Type of address of octet (see *3GPP TS 24.008 subclause 10.5.4.7* for details). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character "+") 161 National type
<text>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CSCS="GSM"
OK
AT+CPBW=10,"15021012496",129,"QUECTEL"
OK                                  //Make a new phonebook entry at location 10
AT+CPBW=10                          //Delete entry at location 10
OK
```

8 Short Message Service Commands

8.1. AT+CSMS Select Message Service

This command selects messaging service **<service>** and returns the types of messages supported by the ME.

AT+CSMS Select Message Service	
Test Command **AT+CSMS=?**	Response **+CSMS: (**list of supported **<service>**s**)** **OK**
Read Command **AT+CSMS?**	Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**
Write Command **AT+CSMS=<service>**	Response **+CSMS: <mt>,<mo>,<bm>** **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<service>	Integer type. Type of message service	
	0	*3GPP TS 23.040* and *3GPP TS 23.041* (the syntax of SMS AT commands is compatible with *3GPP TS 27.005 Phase 2 version 4.7.0*; Phase 2+ features which do not require new command syntax may be supported, e.g. correct routing of messages with new Phase 2+ data coding schemes).
	1	*3GPP TS 23.040* and *3GPP TS 23.041* (the syntax of SMS AT commands is

	compatible with *3GPP TS 27.005 Phase 2+ version*; the requirement of **<service>** setting 1 is mentioned under corresponding command descriptions).
<mt>	Integer type. Mobile terminated messages 0 Type not supported 1 Type supported
<mo>	Integer type. Mobile originated messages 0 Type not supported 1 Type supported
<bm>	Integer type. Broadcast type messages 0 Type not supported 1 Type supported
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CSMS=?                          //Test command
+CSMS: (0,1)

OK
AT+CSMS=1                          //Set type of message service as 1
+CSMS: 1,1,1

OK
AT+CSMS?                           //Read command
+CSMS: 1,1,1,1

OK
```

8.2. AT+CMGF Message Format

This command specifies the input and output format of the short messages. **<mode>** indicates the format of messages used with the Test, Read, Write and Execution Commands and unsolicited result codes resulting from received messages.

The format of messages can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter **<chset>** specified by **AT+CSCS** to inform the character set to be used in the message body in the TA-TE interface.

AT+CMGF Message Format	
Test Command **AT+CMGF=?**	Response **+CMGF: (**list of supported **<mode>**s**)**

	OK
Read Command **AT+CMGF?**	Response **+CMGF: <mode>** **OK**
Write Command **AT+CMGF[=<mode>]**	Response TA sets parameter to denote which kind of I/O format of messages is used. **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<mode>	Integer type.	
	0	PDU mode
	1	Text mode

8.3. AT+CSCA Service Center Address

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

AT+CSCA Service Center Address	
Test Command **AT+CSCA=?**	Response **OK**
Read Command **AT+CSCA?**	Response **+CSCA: <sca>,<tosca>** **OK**
Write Command **AT+CSCA=<sca>[,<tosca>]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms

Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<sca>	Service center address. *3GPP TS 24.011* RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<tosca>**.
<tosca>	Type of service center address. *3GPP TS 24.011* RP SC address Type-of-Address octet in integer format (default see **<toda>**).
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CSCA="+8613800210500",145          //Set SMS service center address
OK
AT+CSCA?                              //Query SMS service center address
+CSCA: "+8613800210500",145

OK
```

8.4. AT+CPMS Preferred Message Storage

This command selects the memory storages **<mem1>**, **<mem2>** and **<mem3>** to be used for reading, writing, etc.

AT+CPMS Preferred Message Storage	
Test Command **AT+CPMS=?**	Response **+CPMS: (**list of supported **<mem1>**s**),(**list of supported **<mem2>**s**),(**list of supported **<mem3>**s**)** **OK**
Read Command **AT+CPMS?**	Response **+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK**
Write Command	Response

AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	**+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<mem1>	String type. Messages to be read and deleted from this memory storage "SM" (U)SIM message storage "ME" Mobile equipment message storage
<mem2>	String type. Messages will be written and sent to this memory storage "SM" (U)SIM message storage "ME" Mobile equipment message storage
<mem3>	String type. Received messages will be placed in this memory storage if routing to PC is not set (**AT+CNMI**) "SM" (U)SIM message storage "ME" Mobile equipment message storage
<usedx>	Integer type. Number of current messages in **<memx>**
<totalx>	Integer type. Total number of messages which can be stored in **<memx>**
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CPMS="SM","SM","SM"                  //Set SMS message storage as "SM"
+CPMS: 0,50,0,50,0,50

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

OK
```

8.5. AT+CMGD Delete Message

This command deletes short messages from the preferred message storage **<mem1>** location **<index>**. If **<delflag>** is presented and not set to 0, then the ME shall ignore **<index>** and follow the rules of **<delflag>** shown as below.

AT+CMGD Delete Message	
Test Command **AT+CMGD=?**	Response **+CMGD: (**list of supported **<index>**s**),(**list of supported **<delflag>**s**)** **OK**
Write Command **AT+CMGD=<index>[,<delflag>]**	Response TA deletes message from preferred message storage **<mem1>** location **<index>**. **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms. Note: Operation of **<delflag>** depends on the storage of deleted messages.
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type. Value in the range of location numbers supported by the associated memory.
<delflag>	Integer type. 0 Delete the message specified in **<index>** 1 Delete all read messages from **<mem1>** storage 2 Delete all read messages from **<mem1>** storage and sent mobile originated messages 3 Delete all read messages, sent and unsent mobile originated messages from **<mem1>** storage 4 Delete all messages from **<mem1>** storage
<mem1>	String type. Messages to be read and deleted from this memory storage "SM" (U)SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CMGD=1                    //Delete the message specified in <index>=1
OK
AT+CMGD=1,4                  //Delete all messages from <mem1> storage
OK
```

8.6. AT+CMGL List Messages

This Read Command returns messages with status value **<stat>** from preferred message storage **<mem1>** to the TE. If the status of the message is REC UNREAD, the status in the storage changes to REC READ. When executing **AT+CMGL** without status value **<stat>**, it will report the list of SMS with REC UNREAD status.

AT+CMGL List Messages	
Test Command **AT+CMGL=?**	Response **+CMGL: (**list of supported **<stat>**s**)** **OK**
Write Command **AT+CMGL[=<stat>]**	Response If in text mode (**AT+CMGF=1**) and the command is executed successfully: For SMS-SUBMITs and/or SMS-DELIVERs: **+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<toa/toda>,<length>]<CR><LF><data>[<CR><LF>** **+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<toa/toda>,<length>]<CR><LF><data>[...]]** For SMS-STATUS-REPORTs: **+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF>** **+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]]** For SMS-COMMANDs: **+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>** **+CMGL: <index>,<stat>,<fo>,<ct>[...]]** For CBM storage: **+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF>** **+CMGL:**

	<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]] **OK** If in PDU mode (**AT+CMGF=0**) and the command is executed successfully: **+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu><CR><LF>** **+CMGL:** **<index>,<stat>,[alpha],<length><CR><LF><pdu>[...]]** **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Execution Command **AT+CMGL**	Response List all messages with REC UNREAD status from message storage **<mem1>**, and then the status in the storage changes to REC READ.
Maximum Response Time	300 ms. Note: Operation of **<stat>** depends on the storage of listed messages.
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<stat>	String type. In text mode:	
	“REC UNREAD”	Received unread messages
	“REC READ”	Received read messages
	“STO UNSENT”	Stored unsent messages
	“STO SENT”	Stored sent messages
	“ALL”	All messages
	Integer type. In PDU mode:	
	0	Received unread messages
	1	Received read messages
	2	Stored unsent messages
	3	Stored sent messages
	4	All messages
<index>	Integer type. Value in the range of location numbers supported by the associated memory	

<da>	Destination Address. *3GPP TS 23.040* TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<oa>	Originating address. *3GPP TS 23.040* TP-Originating-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<tooa>**.
<alpha>	String type alphanumeric representation of **<da>** or **<oa>** corresponding to the entry found in MT phonebook. Implementation of this feature is manufacturer specified. The used character set should be the one selected with **AT+CSCS** (see definition of this command in *3GPP TS 27.007*).
<scts>	Service center time stamp. *3GPP TS 23.040* TP-Service-Centre-Time-Stamp in time-string format (see **<dt>**).
<toda>	Type of recipient address. *3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format.
<tooa>	Type of originating address. *3GPP TS 24.011* TP-Originating-Address Type-of-Address octet in integer format (default see **<toda>**).
<length>	Integer type. Message length. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**) the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<data>	In the case of SMS: *3GPP TS 23.040* TP-User-Data in text mode responses; format: - If **<dcs>**, indicates that *3GPP TS 23.038* GSM 7 bit default alphabet is used and **<fo>** indicates that *3GPP TS 23.040* TP-User-Data-Header-Indication is not set. - If TE character set other than "HEX" (see **AT+CSCS** in *3GPP TS 27.007*): ME/TA converts GSM alphabet into current TE character set according to rules of *Annex A* in *3GPP TS 27.007*. - If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55)). - If **<dcs>**, indicates that 8-bit or UCS2 data coding scheme is used, or **<fo>** indicates that *3GPP TS 23.040* TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: *3GPP TS 23.041* CBM Content of Message in text mode responses; format: - If **<dcs>**, indicates that *3GPP TS 23.038* GSM 7 bit default alphabet is used: - If TE character set other than "HEX" (see **AT+CSCS** in *3GPP TS27.007*): ME/TA converts GSM alphabet into current TE character set according to rules of *Annex A* in *3GPP TS 27.007*. - If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal number.

	- If **<dcs>**, indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.
<pdu>	In the case of SMS: *3GPP TS 24.011* SC address followed by *3GPP TS 23.040* TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) *3GPP TS 27.007*.
<mem1>	String type. Messages to be read and deleted from this memory storage "SM" (U)SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CMGF=1                          //Set SMS message format as text mode
OK
AT+CMGL="ALL"                      //List all messages from message storage
+CMGL: 1,"STO UNSENT","",,
<This is a test from Quectel>
+CMGL: 2,"STO UNSENT","",,
<This is a test from Quectel>

OK
```

8.7. AT+CMGR Read Message

This command returns SMS message with location value **<index>** from message storage **<mem1>** to the TE. If status of the message is "REC UNREAD", status in the storage changes to "REC READ".

AT+CMGR Read Message	
Test Command **AT+CMGR=?**	Response **OK**
Write Command **AT+CMGR=<index>**	Response If in text mode (**AT+CMGF=1**) and the command is executed successfully: For SMS-DELIVER: **+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** **OK** For SMS-SUBMIT:

	+CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> **OK** For SMS-STATUS-REPORTs: **+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **OK** For SMS-COMMANDs: **+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]** **OK** For CBM storage: **+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** **OK** If in PDU mode (**AT+CMGF=0**) and command is executed successfully: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	Depends on the length of message content.
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type. Value in the range of location numbers supported by the associated memory.
<stat>	String type. In text mode: "REC UNREAD" Received unread messages

	"REC READ"	Received read messages
	"STO UNSENT"	Stored unsent messages
	"STO SENT"	Stored sent messages
	"ALL"	All messages
	Integer type. In PDU mode:	
	0	Received unread messages
	1	Received read messages
	2	Stored unsent messages
	3	Stored sent messages
	4	All messages
<alpha>	String type alphanumeric representation of **<da>** or **<oa>** corresponding to the entry found in MT phonebook. Implementation of this feature is manufacturer specified. The used character set should be the one selected with **AT+CSCS** (see definition of this command in *3GPP TS 27.007*).	
<da>	Destination address. *3GPP TS 23.040* TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.	
<oa>	Originating address. *3GPP TS 23.040* TP-Originating-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<tooa>**.	
<scts>	Service center time stamp. *3GPP TS 23.040* TP-Service-Centre-Time-Stamp in time-string format (see **<dt>**).	
<fo>	First octet. Depending on the command or result code: First octet of *3GPP TS 23.040* SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND in integer format. If a valid value has been entered once, the parameter can be omitted.	
<pid>	Protocol identifier. *3GPP TS 23.040* TP-Protocol-Identifier in integer format (default 0).	
<dcs>	Data coding scheme. Depending on the command or result code: *3GPP TS 23.038* SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.	
<vp>	Validity period. Depending on SMS-SUBMIT **<fo>** setting: *3GPP TS 23.040* TP-Validity-Period either in integer format or in time-string format (see **<dt>**).	
<mn>	Message number. *3GPP TS 23.040* TP-Message-Number in integer format.	
<mr>	Message reference. *3GPP TS 23.040* TP-Message-Reference in integer format.	
<ra>	Recipient address. *3GPP TS 23.040* TP-Recipient-Address Address-Value field in string format. BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS**). The type of address is given by **<tora>**.	
<tora>	Type of recipient address. *3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format (default refer **<toda>**).	
<toda>	Type of destination address. *3GPP TS 24.011* TP-Destination-Address	

	Type-of-Address octet in integer format.
<tooa>	Type of originating address. *3GPP TS 24.011* TP-Originating-Address Type-of-Address octet in integer format (default see **<toda>**).
<sca>	Service center address. *3GPP TS 24.011* RP SC address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<tosca>**.
<tosca>	Type of service center address. *3GPP TS 24.011* RP SC address. Type-of-Address octet in integer format (default see **<toda>**).
<length>	Message length. Integer type. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**) the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<data>	The text of short message.
<pdu>	In the case of SMS: *3GPP TS 24.011* SC address followed by *3GPP TS 23.040* TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).
<dt>	*3GPP TS 23.040* TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss zz", during which characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals "94/05/06,22:10:00+08".
<st>	*3GPP TS 23.040* TP-Status in integer format.
<ct>	The TP Command Type is an 8 bit field specifying the type of operation that the SC is to perform. See *3GPP 23.040* for details.
<cdata>	The TP Command Data field contains data relating to the operation requested by the MS which is to be performed at the SC. The maximum length of this field is 157 octets. The usage and provision of the optional TP Command Data field shall be determined by the function selected by the TP Command Type field. See *3GPP 23.040* for details.
<sn>	Integer type. Serial number.
<mid>	Integer type. Message ID.
<page>	Integer type. Page.
<pages>	Integer type. Total pages.
<mem1>	String type. Messages to be read and deleted from this memory storage. "SM" (U)SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
+CMTI: "SM",3                    //Indicates that new message has been received and saved
                                   to <index>=3 of "SM"
AT+CSDH=1
```

```
OK
AT+CMGR=3                                    //Read message
+CMGR: "REC UNREAD","+8615021012496",,"18/12/15,15:06:37+32",145,4,0,0,"+8613800210500",145,27
<This is a test from Quectel>

OK
```

8.8. AT+CMGS Send Message

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

AT+CMGS Send Message	
Test Command **AT+CMGS=?**	Response **OK**
Write Command 1) If in text mode (**AT+CMGF=1**): **AT+CMGS=<da>[,<toda>]<CR>** **>**Text is entered. **<Ctrl+Z/ESC>** Send the message/Quit the sending. 2) If PDU mode (**AT+CMGF=0**): **AT+CMGS=<length><CR>** PDU is given. **<Ctrl+Z/ESC>** Send the message/Quit the sending.	Response TA sends message from TE to the network (SMS-SUBMIT). Message reference value **<mr>** is returned to the TE on successful message delivery. Optionally (when **AT+CSMS <service>** value is 1 and network supports) **<scts>** is returned. Values can be used to identify message upon unsolicited delivery status report result code. If in text mode (**AT+CMGF=1**) and sent successfully: **+CMGS: <mr>** **OK** If in PDU mode (**AT+CMGF=0**) and sent successfully: **+CMGS: <mr>** **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**

Maximum Response Time	120 s, determined by network.
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<da>	Destination address. *3GPP TS 23.040* TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<toda>	Type of recipient address. *3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format.
<length>	Message length. Integer type. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<mr>	Message reference. *3GPP TS 23.040* TP-Message-Reference in integer format.
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CMGF=1                                  //Set SMS message format as text mode
OK
AT+CSCS="GSM"                              //Set character set as GSM which is used by the TE
OK
AT+CMGS="15021012496"
> <This is a test from Quectel>            //Text is entered. Use <Ctrl+Z> to send the message,
                                           or <ESC> to quit the sending.
+CMGS: 247

OK
```

8.9. AT+CMMS Send More Messages

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

AT+CMMS Send More Messages	
Test Command	Response

AT+CMMS=?	**+CMMS:** (list of supported **<n>**s) **OK**
Read Command **AT+CMMS?**	Response **+CMMS: <n>** **OK**
Write Command **AT+CMMS=<n>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	120 s, determined by network.
Characteristics	This command takes effect immediately
Reference 3GPP TS 27.005	

Parameter

<n>	Integer type.	
	0	Feature disabled
	1	Keep enabled until the time between the response of the latest message send command (**AT+CMGS**, **AT+CMSS**, etc.) and the next send command exceeds 1–5 seconds (the exact value is up to ME implementation), and then ME shall close the link and TA switches **<n>** back to 0 automatically
	2	Feature enabled (If the time between the response of the latest message send command and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation), ME shall close the link but TA will not switch **<n>** back to 0 automatically)
<err>	Error codes. See ***Chapter 11.5*** for details.	

NOTE

After the use of Read Command, a delay of 5–10 seconds is required before issuing the Write Command. Otherwise **+CMS ERROR: 500** may appear.

8.10. AT+CMGW Write Message to Memory

This command stores short messages from TE to memory storage **<mem2>**, and then the memory location **<index>** of the stored message is returned. Message status will be set to "STO UNSENT" by default, but parameter **<stat>** also allows other status values to be given.

The syntax of input text is the same as the one specified in **AT+CMGS** Write Command.

AT+CMGW Write Message to Memory	
Test Command **AT+CMGW=?**	Response **OK**
Write Command 1) If text mode (**AT+CMGF=1**): **AT+CMGW=<oa/da>[,<tooa/toda>[,<stat>]]<CR>** **>**Text is entered. **<Ctrl+Z/ESC>** Send the message/Quit the sending. 2) If PDU mode (**AT+CMGF=0**): **AT+CMGW=<length>[,<stat>]<CR>** PDU is given. **<Ctrl+Z/ESC>** Send the message/Quit the sending.	Response If writing is successful: **+CMGW: <index>** **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<da>	Destination address. *3GPP TS 23.040* TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<oa>	Originating address. *3GPP TS 23.040* TP-Originating-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address given by **<tooa>**.
<tooa>	Type of originating address. *3GPP TS 24.011* TP-Originating-Address Type-of-Address octet in integer format (default see **<toda>**).

<stat>	PDU mode	Text mode	Explanation
	0	"REC UNREAD"	Received unread messages
	1	"REC READ"	Received read messages
	2	"STO UNSENT"	Stored unsent messages
	3	"STO SENT"	Stored sent messages
	4	"ALL"	All messages
<toda>	Type of recipient address. *3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format.		
<length>	Message length. Integer type, indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).		
<pdu>	In the case of SMS: *3GPP TS 24.011* SC address followed by *3GPP TS 23.04* TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).		
<index>	Index of message in selected storage **<mem2>**.		
<err>	Error codes. See ***Chapter 11.5*** for details.		

Example

```
AT+CMGF=1                          //Set SMS message format as text mode
OK
AT+CSCS="GSM"                      //Set character set as GSM which is used by the TE
OK
AT+CMGW="15021012496"
> <This is a test from Quectel>    //Text is entered. Use <Ctrl+Z> to send the message, or <ESC> to
                                     quit the sending.
+CMGW: 4

OK
AT+CMGF=0                          //Set SMS message format as PDU mode
OK
AT+CMGW=18
> 0051FF00000008000A0500030002016D4B8BD5
+CMGW: 5

OK
```

8.11. AT+CMSS Send Message from Storage

This Write Command sends messages with location value **<index>** from message storage **<mem2>** to the network (SMS-SUBMIT). If a new recipient address **<da>** is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value **<mr>** is returned to the TE on successful message delivery. Values can be used to identify message upon unsolicited delivery status report result code.

AT+CMSS Send Message from Storage	
Test Command **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>[,<toda>]]**	Response If in text mode (**AT+CMGF=1**) and sent successfully: **+CMSS: <mr>[,<scts>]** **OK** If in PDU mode (**AT+CMGF=0**) and sent successfully: **+CMSS: <mr> [,<ackpdu>]** **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	120 s, determined by network.
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type. Value in the range of location numbers supported by the associated memory.
<da>	Destination Address. *3GPP TS 23.040* TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (see **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<toda>	Type of recipient address. *3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format.
<mr>	Message reference. *3GPP TS 23.040* TP-Message-Reference in integer format.

<scts>	Service center time stamp. *3GPP TS 23.040* TP-Service-Centre-Time-Stamp in time-string format (see **<dt>**).
<ackpdu>	The format is the same as **<pdu>** in case of SMS, but without *3GPP TS 24.011* SC address field and the parameter shall be bounded by double quote characters like a normal string type parameter.
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CMGF=1                          //Set SMS message format as text mode.
OK
AT+CSCS="GSM"                      //Set character set as GSM which is used by the TE.
OK
AT+CMGW="15021012496"
> Hello                            //Text is entered. Use <CTRL+Z> to send message or <ESC> to quit the sending.

+CMGW: 4

OK
AT+CMSS=4                          //Send the message of index 4 from memory storage.
+CMSS: 54

OK
```

8.12. AT+CNMA New Message Acknowledgement to UE/TE

This Write and Execution Commands confirm successful receipt of a new message (SMS-DELIVER or SMS-STATUS-REPORT) routed directly to the TE. If the UE does not receive acknowledgement within required time (network timeout), it sends an **RP-ERROR** message to the network. The UE will automatically disable routing to the TE by setting both **<mt>** and **<ds>** values of **AT+CNMI** to 0.

AT+CNMA New Message Acknowledgement to UE/TE	
Test Command **AT+CNMA=?**	Response **+CNMA:** (list of supported **<n>**s) **OK**
Execution Command **AT+CNMA**	Response **OK** Or **ERROR** If there is any error related to ME functionality:

	+CMS ERROR: <err>
Write Command **AT+CNMA=<n>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<n>	Integer type. Parameter required only for PDU mode 0 Command operates similarly as in text mode 1 Send positive (RP-ACK) acknowledgement to the network. Accepted only in PDU mode 2 Send negative (RP-ERROR) acknowledgement to the network. Accepted only in PDU mode
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

The Execution and Write Commands shall only be used when **AT+CSMS** parameter **<service>** equals 1 (phase 2+) and an appropriate URC has been issued by the module, i.e.:
+CMT for **<mt>**=2 incoming message classes 0, 1, 3 and none;
+CMT for **<mt>**=3 incoming message classes 0 and 3;
+CDS for **<ds>**=1.

Example

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

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

+CMT: “+8615021012496”,,“18/12/15,17:07:21+32”,145,4,0,0,”+8613800551500”,145,28
This is a test from Quectel.          //Short message is outputted directly when an SMS is incoming.
AT+CNMA                               //Send ACK to the network.
```

```
OK
AT+CNMA
+CMS ERROR：340                    //The second time to return error. It needs ACK only once.
```

8.13. AT+CNMI SMS Event Reporting Configuration

This Write Command selects the procedure on how the received new messages from the network are indicated to the TE when TE is active, e.g. DTR is at low level (ON). If TE is inactive (e.g. DTR is at high level (OFF)), message receiving should be done as specified in *3GPP TS 23.038*.

AT+CNMI SMS Event Reporting Configuration	
Test Command **AT+CNMI=?**	Response **+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**
Read Command **AT+CNMI?**	Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**
Write Command **AT+CNMI[=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.005	

Parameter

<mode>	Integer type.	
	0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
	1	Discard indication and reject new received message unsolicited result codes

when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.

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

<mt> Integer type. The rules for storing received SMS depend on its data coding scheme (see *3GPPTS 23.038*) and preferred memory storage (**AT+CPMS**) setting, and the value is:

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

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

2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code: **+CMT: [<alpha>],<length><CR><LF><pdu>** (PDU mode enabled) or **+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** (text mode enabled; about the parameters in italics, see **AT+CSDH**) or **^HCMT: <oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>** (text mode for CDMA SMS). Class 2 messages result in indication as defined in **<mt>**=1.

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

<bm> Integer type. The rules for storing received CBMs depend on its data coding scheme (see *3GPP TS 23.038*) and the setting of Select CBM Types (**AT+CSCB**), and the value is:

0 No CBM indications are routed to the TE.

2 New CBMs are routed directly to the TE using unsolicited result code:
+CBM: <length><CR><LF><pdu> (PDU mode); or
+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode)

<ds> Integer type.

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

1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:
+CDS: <length><CR><LF><pdu> (PDU mode)
+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode)

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

<bfr> Integer type.

0 TA 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).

1 TA buffer of unsolicited result codes defined within this command is cleared when **<mode>** 1 or 2 is entered.

<err> Error codes. See ***Chapter 11.5*** for details.

NOTE

Unsolicited result code:

+CMTI: <mem>,<index>	Indicates that a new message has been received.
+CMT: [<alpha>],<length><CR><LF><pdu>	A short message is outputted directly.
+CBM: <length><CR><LF><pdu>	A cell broadcast message is outputted directly.

Example

```
AT+CMGF=1                          //Set SMS message format as text mode
OK
AT+CSCS="GSM"                      //Set character set as GSM which is used by the TE
OK
AT+CNMI=1,2,0,1,0                  //Set SMS-DELIVERs are routed directly to the TE
OK

+CMT: "+8615021012496",,"18/12/15,17:07:21+32",145,4,0,0,"+8613800551500",145,28
This is a test from Quectel.       //Short message is outputted directly when an SMS is incoming.
```

8.14. AT+CSCB Select Cell Broadcast Message Types

This Write Command selects which types of CBMs are to be received by the ME.

AT+CSCB Select Cell Broadcast Message Types	
Test Command **AT+CSCB=?**	Response **+CSCB:** (list of supported **<mode>**s) **OK**
Read Command **AT+CSCB?**	Response **+CSCB : <mode>,<mids>,<dcss>** **OK**
Write Command **AT+CSCB=<mode>,<mids>[,<dcss>]**	Response **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately. The configuration will be saved to NV automatically.

Reference 3GPP TS 27.005	

Parameter

<mode>	Integer type. 0 Message types specified in **<mids>** and **<dcss>** are accepted 1 Message types specified in **<mids>** and **<dcss>** are not accepted
<mids>	String type. All different possible combinations of CBM message identifiers (see **<mid>**) , e.g. "0,1,5,320-478,922"
<dcss>	String type. All different possible combinations of CBM data coding schemes (see **<dcs>**) (default is empty string), e.g. "0-3,5"
<err>	Error codes. See ***Chapter 11.5*** for details.

8.15. AT+CSDH Show SMS Text Mode Parameters

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

AT+CSDH Show SMS Text Mode Parameters	
Test Command **AT+CSDH=?**	Response **+CSDH:** (list of supported **<show>**s) **OK**
Read Command **AT+CSDH?**	Response **+CSDH: <show>** **OK**
Write Command **AT+CSDH=<show>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.005	

Parameter

<show>	Integer type	
	0	Do not show header values defined in commands **+CSCA**, **+CSMP** (**<sca>**, **<tosca>**, **<fo>**, **<vp>**, **<pid>**, **<dcs>**) and **<length>**, **<toda>** or **<tooa>** in **+CMT**, **+CMGL**, **+CMGR** result codes for SMS-DELIVERs and SMS-SUBMITs in text mode
	1	Show the values in result codes

Example

```
AT+CSDH=0
OK
AT+CMGR=2
+CMGR: "STO UNSENT" ,"",
<This is a test from Quectel>
OK
AT+CSDH=1
OK
AT+CMGR=2
+CMGR: "STO UNSENT","",,128,17,0,0,143,"+8613800551500",145,18
<This is a test from Quectel>
OK
```

8.16. AT+CSMP Set SMS Text Mode Parameters

This command is used to set values for additional parameters needed when a short message is sent to the network or placed in a storage in text mode when text mode is selected (**AT+CMGF=1**). It is possible to set the validity period starting from when the SM is received by the SMSC (**<vp>** ranges from 0 to 255) or define the absolute time of the validity period termination (**<vp>** is a string).

AT+CSMP Set SMS Text Mode Parameters	
Test Command **AT+CSMP=?**	Response **OK**
Read Command **AT+CSMP?**	Response **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
Write Command **AT+CSMP=<fo>[,<vp>[,<pid>[,<dcs>]]]**	Response **OK** Or **ERROR**

	If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.005	

Parameter

<fo>	First octet. Depending on the command or result code: First octet of *3GPP TS 23.040* SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, SMS-COMMAND in integer format. If a valid value has been entered once, parameter can be omitted.
<vp>	Validity period. Depending on SMS-SUBMIT **<fo>** setting: *3GPP TS 23.040* TP-Validity-Period either in integer format or in time-string format (see **<dt>**). Default value: 167.
<pid>	Protocol identifier. *3GPP TS 23.040* TP-Protocol-Identifier in integer format (default value is 0).
<dcs>	Data coding scheme. Depending on the command or result code: *3GPP TS 23.038* SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<err>	Error codes. See ***Chapter 11.5*** for details.

8.17. AT+QCMGS Send Concatenated Messages

This command is used to send concatenated massages. Different from **AT+CMGS**, when sending a concatenated message via this command, each segment of the concatenated message must be identified by the additional parameters: **<uid>**, **<msg_seg>** and **<msg_total>**. When sending all segments of the message one by one, **AT+QCMGS** must be executed multiple times (equal to **<msg_total>**) for each segment. This command is only used in text mode (**AT+CMGF=1**).

AT+QCMGS Send Concatenated Messages	
Test Command **AT+QCMGS=?**	Response **OK**
Write Command In text mode (**AT+CMGF=1**): **AT+QCMGS=<da>[,<toda>][,<uid>,<msg_seg>,<msg_total>]<CR>** **>**Text is entered.	Response If in text mode (**AT+CMGF=1**) and sent successfully: **+QCMGS: <mr>** **OK**

<Ctrl+Z/ESC> Send the message/Quit the sending.	Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	120 s, determined by network.
Characteristics	This command takes effect immediately; The configuration will not be saved.

Parameter

<uid>	Integer type. Message identification in the user data header (UDH). Range: 0–255. This parameter is defined and inputted by the user. All segments of a same concatenated message must have the same **<uid>**. Different concatenated messages should have different **<uid>**.
<msg_seg>	Integer type. Sequence number of a concatenated message. Range: 0–7. **<msg_seg>**=0 means: ignore the value and regard it as a non-concatenated message.
<msg_total>	Integer type. The total number of the segments of one concatenated message. Range: 0–7. **<msg_total>**=0 or 1 means: ignore the value and regard it as a non-concatenated message.
<da>	See **AT+CMGS**.
<toda>	See **AT+CMGS**.
<mr>	See **AT+CMGS**.
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

1. For concatenated messages, the maximum length will be reduced by the length of the user data header (UDH). *3GPP TS 23.040* defines two kinds of UDH length: 6 bytes and 7 bytes, so the two kinds of **<uid>** are 8-bit (6 bytes) and 16-bit (7 bytes). **AT+QCMGS** uses 8-bit **<uid>**.
   - In the case of GSM 7 bit default alphabet data coding scheme, the maximum length of each segment of a concatenated message is (140 octets - 6) × 8 / 7 = 153 characters.
   - In the case of 16 bit UCS2 data coding scheme, the maximum length of each segment is (140 - 6) / 2 = 67 characters.
   - In the case of 8-bit data coding scheme, the maximum length of each segment is 140 – 6 = 134 characters.
2. **<mr>** Message-Reference field gives an integer representation of a reference number of the SMS-SUBMIT or SMS-COMMAND submitted to the SC by the MS, and it is used to confirm whether the SMS-DELIVER has been received from SC duplicate or not.
   <uid> The field of UDH. It is message identification of the concatenated SMS, which is different from **<mr>**. Each segment in a concatenated message should have the same **<uid>**, but

<mr> must be incremented for each segment of a concatenated message.

3. **AT+QCMGS** does not support to send message in PDU mode (**AT+CMGF=0**).

Example

```
AT+CMGF=1                                  //Set SMS message format as text mode
OK
AT+CSCS="GSM"                              //Set character set as GSM which is used by the TE
OK
AT+QCMGS="15056913384",120,1,2             //Input 120 for <uid>, and send the first segment of
                                            the concatenated SMS
>ABCD                                      //Text is entered. Use <Ctrl+Z> to send the message,
                                            or <ESC> to quit the sending.
+QCMGS: 190

OK

AT+QCMGS="15056913384",120,2,2             //Send the second segment of the concatenated SMS.
>EFGH                                      //Text is entered. Use <Ctrl+Z> to send the message,
                                            or <ESC> to quit the sending.
+QCMGS: 191

OK
```

8.18. AT+QCMGR Read Concatenated Messages

The function of this command is similar to **AT+CMGR**, except that the message to be read is a segment of concatenated messages, and parameters **<uid>**, **<msg_seg>** and **<msg_total>** would be shown in the result. Several segments should be concatenated to a whole concatenated message according to these three parameters. Similar to **AT+QCMGS**, **AT+QCMGR** is only used in text mode (**AT+CMGF=1**).

AT+QCMGR Read Concatenated Messages	
Test Command **AT+QCMGR=?**	Response **OK**
Write Command **AT+QCMGR=<index>**	Response If in text mode (**AT+CMGF=1**) and command is executed successfully: For SMS-DELIVER: **+QCMGR:** **<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]** **<CR><LF><data>**

	OK For SMS-SUBMIT: **+QCMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]<CR><LF><data>** **OK** For SMS-STATUS-REPORTs: **+QCMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **OK** For SMS-COMMANDs: **+QCMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]** **OK** Else, if there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	Depends on the length of message content.
Characteristics	This command takes effect immediately; The configuration will be saved automatically.

Parameter

<uid>	Integer type. Message identification in the user data header (UDH). Range: 0-65535 (see **NOTE** below). All segments of a same concatenated message have same **<uid>**. Different concatenated messages should have different **<uid>**.
<msg_seg>	Integer type. Sequence number of a concatenated message. Range: 1-7.
<msg_total>	Integer type. The total number of the segments of one concatenated message. Range: 2-7.
	See **AT+CMGR** for details of other parameters.
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

1. The **<uid>** in **AT+QCMGR** is different from the **<uid>** in **AT+QCMGS**. It is possible that UE receives concatenated messages with 8-bit or 16-bit **<uid>**, so its maximal value is 255 with 8-bit and 65535 with 16-bit.
2. If the message to be read is not a concatenated message, **<uid>**, **<msg_seg>** and **<msg_total>** would not be shown in the result.

Example

```
+CMTI: "SM",3                  //The first message of a concatenated message comes.

+CMTI: "SM",4                  //The second message of a concatenated message comes.

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

OK
AT+QCMGR=4                     //Read the second segment of the concatenated message.
+QCMGR: "REC UNREAD","+8615056913384",,"18/12/20,14:44:37+32",120,2,2
EFGH

OK
```

9 Packet Domain Commands

9.1. AT+CGATT Attachment or Detachment of PS

This Write Command is used to attach the MT to, or detach the MT from the Packet Domain service. After the command has been completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the **OK** response will be returned. If the requested state cannot be achieved, an **ERROR** or **+CME ERROR** response is returned.

AT+CGATT Attachment or Detachment of PS	
Test Command **AT+CGATT=?**	Response **+CGATT:** (list of supported **<state>**s) **OK**
Read Command **AT+CGATT?**	Response **+CGATT: <state>** **OK**
Write Command **AT+CGATT=<state>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	140 s, determined by network.
Characteristics	This command takes effect immediately; The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<state>	Integer type. Indicates the state of PS attachment	
	0	Detached
	1	Attached

<err>	Other values are reserved and will result in an **ERROR** response to the Write Command Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CGATT=1                    //Attach to PS service
OK
AT+CGATT=0                    //Detach from PS service
OK
AT+CGATT?                     //Query the current PS service state
+CGATT: 0

OK
```

9.2. AT+CGDCONT Define PDP Context

This command specifies PDP context parameters for a specific context **<cid>**. A special form of the Write Command (**AT+CGDCONT=<cid>**) causes the values for context **<cid>** to become undefined. It is not allowed to change the definition of an already activated context.

This Read Command returns the current settings for each defined PDP context.

AT+CGDCONT Define PDP Context	
Test Command **AT+CGDCONT=?**	Response **+CGDCONT:** (range of supported **<cid>**s),**<PDP_type>, <APN>,<PDP_addr>,**(list of supported **<data_comp>**s),(list of supported **<head_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) **OK**
Read Command **AT+CGDCONT?**	Response **+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>[…]** **OK**
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<data_comp>[,<head_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<I**	Response **OK** Or **ERROR**

M_CN_Signalling_Flag_Ind>]]]]]]]]	
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately; The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<cid> PDP context identifier. Range: 1–15. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command.

<PDP_type> String type. Packet data protocol type, a string parameter which specifies the type of packet data protocol.

"IP" Internet Protocol (*IETF STD 5*)

"PPP" Point to Point Protocol (*IETF STD 5*)

Only IP, IPv6 and IPv4v6 values are supported for EPS services.

"IPV6" Internet Protocol, version 6

"IPV4V6" Virtual **<PDP_type>** introduced to handle dual IP stack UE capability

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

<PDP_addr> A string parameter identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The allocated address may be read using the **AT+CGPADDR** command.

<data_comp> A numeric parameter that controls PDP data compression (applicable for SNDCP only) (see *3GPP TS 44.065*).

0 Off (Default if value is omitted)

1 On (Manufacturer preferred compression)

2 V.42bis

3 V.44 (Not supported currently)

<head_comp> A numeric parameter that controls PDP header compression (see *3GPP TS 44.065* and *3GPP TS 25.323*).

0 Off

1 On

2 RFC1144

3 RFC2507

4 RFC3095

<IPv4AddrAlloc> Numeric type. Control how the MT/TA requests to get the IPv4 address information.

0 IPv4 address allocated through NAS signalling

	1 IPv4 address allocated through DHCP
<request_type>	Numeric type. Indicate the type of PDP context activation request for the PDP context. Please see *3GPP TS 24.301 (subclause 6.5.1.2)* and *3GPP TS 24.008 (subclause 10.5.6.17)*. If the initial PDP context is supported *(subclause 10.1.0)*, it is not allowed to assign **<cid>**=0 for emergency bearer services. According to *3GPP TS 24.008 (subclause 4.2.4.2.2 and 4.2.5.1.4)* and *3GPP TS 24.301 (subclause 5.2.2.3.3 and 5.2.3.2.2)*, a separate PDP context must be established for emergency bearer services.
<P-CSCF_discovery>	Numeric type. Affect how the MT/TA requests to get the P-CSCF address, (refer to *3GPP TS 24.229* ***annex B*** *and* ***L***).
	0 Preference of P-CSCF address discovery not affected by **AT+CGDCONT**
	1 Preference of P-CSCF address discovery through NAS signaling
	2 Preference of P-CSCF address discovery through DHCP
<IM_CN_Signalling_Flag_Ind>	Numeric type. Indicates to the network whether the PDP context is for IM CN subsystem-related signaling only or not.
	0 UE indicates that the PDP context is not for IM CN subsystem-related signaling only
	1 UE indicates that the PDP context is for IM CN subsystem-related signaling only.

NOTE

Currently the PDP context parameters can be saved after power-off.

9.3. AT+CGQREQ Quality of Service Profile (Requested)

This command allows the TE to specify the quality of service profile that is used when the MT activates a PDP context.

The Write Command specifies a profile for the context **<cid>**. A special form of the Write Command, **AT+CGQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined. The Read Command returns the current settings for each defined context.

AT+CGQREQ Quality of Service Profile (Requested)	
Test Command **AT+CGQREQ=?**	Response **+CGQREQ: <PDP_type>,**(list of supported **<precedence>**s)**,** (range of supported **<delay>**s)**,**(list of supported **<reliability>**s)**,**(list of supported **<peak>**s)**,**(list of supported **<mean>**s) **OK**

Read Command **AT+CGQREQ?**	Response **[+CGQREQ: <cid>,<precedence>,<delay>,>reliability>,<peak>,<mean>]** **[+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>]** **[…]** **OK**
Write Command **AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command).
<PDP_type>	String type. Packet Data Protocol type. "IP" Internet Protocol (*IETF STD 5*) "PPP" Point to Point Protocol (*IETF STD 51*) Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6" Internet Protocol, version 6 "IPV4V6" Virtual **<PDP_type>** introduced to handle dual IP stack UE capability
<precedence>	A numeric parameter which specifies the precedence class. 0 Network subscribed value 1 High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3 2 Normal priority. Service commitments shall be maintained ahead of precedence class 3 3 Low priority. Service commitments shall be maintained
<delay>	A numeric parameter which specifies the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. For the details, see ***Table 4***.

	0 Network subscribed value
<reliability>	A numeric parameter which specifies the reliability class
	0 Network subscribed value
	1 Non real-time traffic, error-sensitive application that cannot cope with data loss
	2 Non real-time traffic, error-sensitive application that can cope with infrequent data loss
	3 Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS
	4 Real-time traffic, error-sensitive application that can cope with data loss
	5 Real-time traffic, error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class, in octets per second.
	0 Network subscribed value
	1 Up to 1 000 (8 kbit/s)
	2 Up to 2 000 (16 kbit/s)
	3 Up to 4 000 (32 kbit/s)
	4 Up to 8 000 (64 kbit/s)
	5 Up to 16 000 (128 kbit/s)
	6 Up to 32 000 (256 kbit/s)
	7 Up to 64 000 (512 kbit/s)
	8 Up to 128 000 (1024 kbit/s)
	9 Up to 256 000 (2048 kbit/s)
<mean>	A numeric parameter which specifies the mean throughput class, in octets per hour.
	0 Network subscribed value
	1 100 (~0.22 bit/s)
	2 200 (~0.44 bit/s)
	3 500 (~1.11 bit/s)
	4 1 000 (~2.2 bit/s)
	5 2 000 (~4.4 bit/s)
	6 5 000 (~11.1 bit/s)
	7 10 000 (~22 bit/s)
	8 20 000 (~44 bit/s)
	9 50 000 (~111 bit/s)
	10 100 000 (~0.22 kbit/s)
	11 200 000 (~0.44 kbit/s)
	12 500 000(~1.11 kbit/s)
	13 1000 000 (~2.2 kbit/s)
	14 2 000 000 (~4.4 kbit/s)
	15 5 000 000 (~11.1 kbit/s)
	16 10 000 000 (~22 kbit/s)
	17 20 000 000 (~44 kbit/s)
	18 50 000 000 (~111 kbit/s)
	31 Best effort
<err>	Error codes. See ***Chapter 11.5*** for details.

Table 4: Delay Class

SDU Size	Delay Class	Mean Transfer Delay	95 Percentile
128 octets	1 (Predictive)	<0.5	< 1.5
	2 (Predictive)	<5	< 25
	3 (Predictive)	<50	< 250
	4 (Best Effort)	Unspecified	-
1024 octets	1 (Predictive)	<0.5	< 1.5
	2 (Predictive)	<5	< 25
	3 (Predictive)	<50	< 250
	4 (Best Effort)	Unspecified	-

9.4. AT+CGQMIN Quality of Service Profile (Minimum Acceptable)

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile when the PDP context is activated. The Write Command specifies a profile for the context identified by the context identification parameter **<cid>**.

A special form of the Write Command, **AT+CGQMIN=<cid>** causes the minimum acceptable profile for context number **<cid>** to become undefined. In this case no check is made against the negotiated profile.

This Read Command returns the current settings for each defined context.

AT+CGQMIN Quality of Service Profile (Minimum Acceptable)	
Test Command **AT+CGQMIN=?**	Response **+CGQMIN: <PDP_type>,** (list of supported **<precedence>**s)**,** (range of supported **<delay>**s)**,**(list of supported **<reliability>**s)**,**(list of supported **<peak>**s)**,** (list of supported **<mean>**s) **OK**
Read Command **AT+CGQMIN?**	Response **[+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>]**

	[+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>] **[…]** **OK**
Write Command **AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately; The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)
<PDP_type>	String type. Packet Data Protocol type "IP" Internet Protocol (*IETF STD 5*) "PPP" Point to Point Protocol (*IETF STD 51*) Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6" Internet Protocol, version 6 "IPV4V6" Virtual **<PDP_type>** introduced to handle dual IP stack UE capability
<precedence>	A numeric parameter which specifies the precedence class 0 Network subscribed value 1 High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3 2 Normal priority. Service commitments shall be maintained ahead of precedence class 3 3 Low priority. Service commitments shall be maintained
<delay>	A numeric parameter which specifies the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. For more details, see ***Table 4***. Range: 0–4. Unit: second. 0 Network subscribed value
<reliability>	A numeric parameter which specifies the reliability class. 0 Network subscribed value 1 Non real-time traffic, error-sensitive application that cannot cope with data

		loss
	2	Non real-time traffic, error-sensitive application that can cope with infrequent data loss
	3	Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS
	4	Real-time traffic, error-sensitive application that can cope with data loss
	5	Real-time traffic, error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class, in octets per second.	
	0	Network subscribed value
	1	Up to 1 000 (8 kbit/s)
	2	Up to 2 000 (16 kbit/s)
	3	Up to 4 000 (32 kbit/s)
	4	Up to 8 000 (64 kbit/s)
	5	Up to 16 000 (128 kbit/s)
	6	Up to 32 000 (256 kbit/s)
	7	Up to 64 000 (512 kbit/s)
	8	Up to 128 000 (1024 kbit/s)
	9	Up to 256 000 (2048 kbit/s)
<mean>	A numeric parameter which specifies the mean throughput class, in octets per hour.	
	0	Network subscribed value
	1	100 (~0.22 bit/s)
	2	200 (~0.44 bit/s)
	3	500 (~1.11 bit/s)
	4	1 000 (~2.2 bit/s)
	5	2 000 (~4.4 bit/s)
	6	5 000 (~11.1 bit/s)
	7	10 000 (~22 bit/s)
	8	20 000 (~44 bit/s)
	9	50 000 (~111 bit/s)
	10	100 000 (~0.22 kbit/s)
	11	200 000 (~0.44 kbit/s)
	12	500 000(~1.11 kbit/s)
	13	1000 000 (~2.2 kbit/s)
	14	2 000 000 (~4.4 kbit/s)
	15	5 000 000 (~11.1 kbit/s)
	16	10 000 000 (~22 kbit/s)
	17	20 000 000 (~44 kbit/s)
	18	50 000 000 (~111 kbit/s)
	31	Best effort
<err>	Error codes. See ***Chapter 11.5*** for details.	

9.5. AT+CGEQREQ 3G Quality of Service Profile (Requested)

This command allows the TE to specify a UMTS Quality of Service Profile that is used when the MT activates a PDP context.

AT+CGEQREQ 3G Quality of Service Profile (Requested)	
Test Command **AT+CGEQREQ=?**	Response **+CGEQREQ: <PDP_type>,**(list of supported **<Traffic class>**s)**,**(list of supported **<Maximum bitrate UL>**s)**,**(list of supported **<Maximum bitrate DL>**s)**,**(list of supported **<Guaranteed bitrate UL>**s)**,**(list of supported **<Guaranteed bitrate DL>**s)**,**(list of supported **<Delivery order>**s)**,**(list of supported **<Maximum SDU size>**s)**,**(list of supported **<SDU error ratio>**s)**,**(list of supported **<Residual bit error ratio>**s)**,**(list of supported **<Delivery of erroneous SDUs>**s)**,**(list of supported **<Transfer delay>**s)**,**(list of supported **<Traffic handling priority>**s)**,**(list of supported **<Source statistics descriptor>**s)**,**(list of supported **<Signalling indication>**s) **OK**
Read Command **AT+CGEQREQ?**	Response **[+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>, <Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signalling indication>]** **[...]** **OK**
Write Command **AT+CGEQREQ=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**

descriptor>[,<Signalling indication>]]]]]]]]]]]]]]	
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately; The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<cid>

PDP context identifier, a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command. Range: 1–15.

<PDP_type>

Packet data protocol type, a string parameter which specifies the type of packet data protocol

"IP" Internet Protocol (*IETF STD 5 [103]*)

"PPP" Point to Point Protocol (*IETF STD 51 [104]*)
Only IP, IPv6 and IPv4v6 values are supported for EPS services.

"IPV6" Internet Protocol, version 6

"IPV4V6" Virtual **<PDP_type>** introduced to handle dual IP stack UE capability

The following parameters are defined in *3GPP TS 23.107*

<Traffic class>

Integer type. Indicates the type of application for which the UMTS bearer service is optimized (see *3GPP TS 24.008 subclause 10.5.6.5*). If the parameter is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided.

0 Conversational
1 Streaming
2 Interactive
3 Background
4 Subscribed value

<Maximum bitrate UL>

Integer type. Indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bit rate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000.

0 Subscribed value
0–64
64–568 (value needs to be a multiple of 8)
568–8640 (value needs to be a multiple of 64)

	8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Maximum bitrate DL>	Integer type. Indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Guaranteed bitrate UL>	Integer type. Indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Guaranteed bitrate DL>	Integer type. Indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Delivery order>	Integer type. Indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 No 1 Yes 2 Subscribed value
<Maximum SDU size>	Integer type. (1,2,3,…) indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be

	requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed value 10...1520 (Value needs to be divisible by 10 without remainder) 1502
<SDU error ratio>	String type. Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5×10^{-3} would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**). "0E0" Subscribed value "1E1" "1E2" "7E3" "1E3" "1E4" "1E5" "1E6"
<Residual bit error ratio>	String type. Indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as "mEe". As an example a target residual bit error ratio of 5×10^{-3} would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**). "0E0" Subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"
<Delivery of erroneous SDUs>	Integer type. Indicates whether SDUs detected as erroneous shall be delivered or not (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 No 1 Yes 2 No detect 3 Subscribed value
<Transfer delay>	Integer type. (0,1,2,…) indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed value

	100–150 (value needs to be divisible by 10 without remainder) 200–950 (value needs to be divisible by 50 without remainder) 1000–4000 (value needs to be divisible by 100 without remainder)
<Traffic handling priority>	Integer type. (1,2,3,…) specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed 1 2 3
<Source statistics descriptor>	Integer type. Specifies characteristics of the source of the submitted SDUs for a PDP context. 0 Characteristics of SDUs is unknown 1 Characteristics of SDUs correspond to a speech source
<Signalling indication>	Integer type. Indicates signaling content of submitted SDUs for a PDP context. 0 PDP context is not optimized for signaling 1 PDP context is optimized for signaling
<err>	Error codes. See ***Chapter 11.5*** for details.

9.6. AT+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)

This command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the PDP context establishment and PDP context modification procedures.

AT+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)	
Test Command **AT+CGEQMIN=?**	Response **+CGEQMIN: <PDP_type>,**(list of supported **<Traffic class>**s)**,**(list of supported **<Maximum bitrate UL>**s)**,**(list of supported **<Maximum bitrate DL>**s)**,**(list of supported **<Guaranteed bitrate UL>**s)**,**(list of supported **<Guaranteed bitrate DL>**s)**,**(list of supported **<Delivery order>**s)**,**(list of supported **<Maximum SDU size>**s)**,**(list of supported **<SDU error ratio>**s)**,**(list of supported **<Residual bit error ratio>**s)**,**(list of supported **<Delivery of erroneous SDUs>**s)**,**(list of supported **<Transfer delay>**s)**,**(list of supported **<Traffic handling priority>**s)**,**(list of supported **<Source statistics descriptor>**s)**,**(list of supported **<Signalling indication>**s)

	OK
Read Command **AT+CGEQMIN?**	Response **[+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signalling indication>]** **[…]** **OK**
Write Command **AT+CGEQMIN=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signalling indication>]]]]]]]]]]]]]]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	This command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<cid>	PDP context identifier. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command.
<PDP_type>	Packet data protocol type. A string parameter which specifies the type of packet data protocol. "IP" Internet Protocol (*IETF STD 5 [103]*)

	"PPP" Point to Point Protocol (*IETF STD 51*) Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6" Internet Protocol, version 6 "IPV4V6" Virtual **<PDP_type>** introduced to handle dual IP stack UE capability The following parameters are defined in *3GPP TS 23.107*
<Traffic class>	Integer type. Indicates the type of application for which the UMTS bearer service is optimized (see *3GPP TS 24.008 subclause 10.5.6.5*). If the parameter is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided. 0 Conversational 1 Streaming 2 Interactive 3 Background 4 Subscribed value
<Maximum bitrate UL>	Integer type. Indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Maximum bitrate DL>	Integer type. Indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Guaranteed bitrate UL>	Integer type. Indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value

	0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Guaranteed bitrate DL>	Integer type. Indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32 kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). Range: 0–256000. 0 Subscribed value 0–64 64–568 (value needs to be a multiple of 8) 568–8640 (value needs to be a multiple of 64) 8640–16000 (value needs to be a multiple of 100) 16000–128000 (value needs to be a multiple of 1000) 128000–256000 (value needs to be a multiple of 2000)
<Delivery order>	Integer type. Indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 No 1 Yes 2 Subscribed value
<Maximum SDU size>	Integer type. (1,2,3,…) indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed value 10...1520 (value needs to be divisible by 10 without remainder) 1502
<SDU error ratio>	String type. Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5×10^{-3} would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**). "0E0" Subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"
<Residual bit error ratio>	String type. Indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit

	error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as "mEe". As an example a target residual bit error ratio of 5×10^{-3} would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**). "0E0" Subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"
<Delivery of erroneous SDUs>	Integer type. Indicates whether SDUs detected as erroneous shall be delivered or not (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 No 1 Yes 2 No detect 3 Subscribed value
<Transfer delay>	Integer type. (0,1,2,…) indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed value 100–150 (value needs to be divisible by 10 without remainder) 200–950 (value needs to be divisible by 50 without remainder) 1000–4000 (value needs to be divisible by 100 without remainder)
<Traffic handling priority>	Integer type. (1,2,3,…) specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested (see *3GPP TS 24.008 subclause 10.5.6.5*). 0 Subscribed 1 2 3
<Source statistics descriptor>	Integer type. Specifies characteristics of the source of the submitted SDUs for a PDP context. 0 Characteristics of SDUs are unknown 1 Characteristics of SDUs corresponds to a speech source
<Signalling indication>	Integer type. Indicates signaling content of submitted SDUs for a PDP context. 0 PDP context is not optimized for signaling 1 PDP context is optimized for signaling

<err>	Error codes. See ***Chapter 11.5*** for details.

9.7. AT+CGACT Activate or Deactivate PDP Context

This Write Command is used to activate or deactivate the specified PDP context(s). After the command has been completed, the MT remains in V.250 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. 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 no **<cid>**s specify the activation/deactivation form of the command, it will activate or deactivate all defined contexts.

AT+CGACT Activate or Deactivate PDP Context	
Test Command **AT+CGACT=?**	Response **+CGACT:** (list of supported **<state>**s) **OK**
Read Command **AT+CGACT?**	Response **+CGACT: <cid>,<state>[<CR><LF>** **+CGACT: <cid>,<state>…]** **OK**
Write Command **AT+CGACT=<state>,<cid>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	150 s, determined by network.
Characteristics	This command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<state>	Indicates the state of PDP context activation 0 Deactivated 1 Activated Other values are reserved and will result in an **ERROR** response to the Write Command

<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT**).
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CGDCONT=1,"IP","UNINET"          //Define PDP context
OK
AT+CGACT=1,1                        //Activate PDP
OK
AT+CGACT=0,1                        //Deactivate PDP
OK
```

9.8. AT+CGDATA Enter Data State

This Write Command causes the MT to perform whatever actions that are necessary to establish communication between the TE and the network using one or more packet domain PDP types. This may include performing a PS attach and one or more PDP context activations. Commands following the **AT+CGDATA** in the AT command line will not be processed by the MT.

If the **<L2P>** value is unacceptable to the MT, the MT shall return an **ERROR** or **+CME ERROR**. Otherwise, the MT issues the intermediate result code **CONNECT** and enters V.250 online data state. After data transfer is completed, and the layer 2 protocol termination procedure has been completed successfully, the command state is reentered and the MT returns the final result code **OK**.

AT+CGDATA Enter Data State	
Test Command **AT+CGDATA=?**	Response **+CGDATA: (**list of supported **<L2P>**s**)** **OK**
Write Command **AT+CGDATA=<L2P>[,<cid>[,<cid>[,…]]]**	Response **CONNECT** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<L2P>	String type. The layer 2 protocol to be used between the TE and MT: "PPP" (Point to Point protocol) for a PDP such as IP. Other values are not supported and result in an **ERROR** response to the execution command.
<cid>	Integer type. A particular PDP context definition (see **AT+CGDCONT**).
<err>	Error codes. See ***Chapter 11.5*** for details.

9.9. AT+CGPADDR Show PDP Address

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

AT+CGPADDR Show PDP Address	
Test Command **AT+CGPADDR=?**	Response **+CGPADDR: (**list of defined **<cid>**s**)** **OK**
Write Command **AT+CGPADDR[=<cid>[,<cid>[,…]]]**	Response **+CGPADDR: <cid>[,<PDP_addr>]** **[…]** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<cid>	Integer type. The particular PDP context definition (see **AT+CGDCONT**).
<PDP_addr>	String type. The MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it is the one set by **AT+CGDCONT** when the context was defined. For a dynamic address, it is the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**. **<PDP_addr>** is omitted if none is available.

Example

```
AT+CGDCONT=1,"IP","UNINET"          //Define PDP context
OK
AT+CGACT=1,1                        //Activate PDP context
OK
AT+CGPADDR=1                        //Show PDP address
+CGPADDR: 1,"10.76.51.180"

OK
```

9.10. AT+CGCLASS GPRS Mobile Station Class

This command sets the MT to operate according to the specified mode of operation. See *3GPP TS 23.060*.

AT+CGCLASS GPRS Mobile Station Class	
Test Command **AT+CGCLASS=?**	Response **+CGCLASS: (**list of supported **<class>**s**)** **OK**
Read Command **AT+CGCLASS?**	Response **+CGCLASS: <class>** **OK**
Write Command **AT+CGCLASS=<class>**	Response **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<class>	String type. The GPRS mobile class (Functionality in descending order) "B" Class-B mode of operation (A/Gb mode), or CS/PS mode of operation (Iu mode)

	"GC"	Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode)
	"CC"	Class-C mode of operation in CS only mode (A/Gb mode), or CS (Iu mode) (lowest mode of operation)
<err>	Error codes. See ***Chapter 11.5*** for details.	

9.11. AT+CGREG PS Domain Network Registration Status

This command queries the PS domain network registration status and controls the presentation of an unsolicited result code **+CGREG: <stat>** when **<n>**=1 and there is a change in network registration status in PS domain, or unsolicited result code **+CGREG: <stat>[,[<lac>],[<ci>],[<AcT>]]** when **<n>**=2 and there is a change of the network cell in PS domain.

AT+CGREG PS Domain Network Registration Status	
Test Command **AT+CGREG=?**	Response **+CGREG: (**range of supported **<n>**s**)** **OK**
Read Command **AT+CGREG?**	Response **+CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]]** **OK**
Write Command **AT+CGREG[=<n>]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will be saved by executing **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type. 0 Disable network registration unsolicited result code 1 Enable network registration unsolicited result code **+CGREG: <stat>** 2 Enable network registration and location information unsolicited result code **+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]**
<stat>	Integer type. The network registration status.

	0 Not registered. MT is not currently searching an operator to register to. The UE is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED. The network service is disabled, but the UE is allowed to attach to the network if requested by the user. 1 Registered, home network. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN. 2 Not registered, but MT is currently trying to attach or searching an operator to register to. The UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The network service is enabled, but an allowable PLMN is currently not available. The UE will start a network attachment as soon as an allowable PLMN is available. 3 Registration denied. The UE is in GMM state GMM-NULL. The network service is disabled, and the UE is not allowed to attach to the network if requested by the user. 4 Unknown. 5 Registered, roaming.
<lac>	String type. Two-bytes location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	String type. 16-bit (GSM) or 28-bit (UMTS/LTE) cell ID in hexadecimal format.
<AcT>	Integer type. Access technology of the serving cell. 0 GSM 2 UTRAN 3 GSM W/EGPRS 4 UTRAN W/HSDPA 5 UTRAN W/HSUPA 6 UTRAN W/HSDPA and HSUPA 7 E-UTRAN 8 UTRAN HSPA+

Example

```
AT+CGREG=2
OK
AT+CGATT=0
OK

+CGREG: 2
AT+CGATT=1
OK

+CGREG: 1,"D5D6","8062AF0",6
```

9.12. AT+CGEREP Packet Domain Event Reporting

This Write Command enables or disables sending of unsolicited result codes **+CGEV: XXX** from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. **<mode>** controls the processing of unsolicited result codes specified within this command. **<bfr>** controls the effect on buffered codes when **<mode>** 1 or 2 is entered.

AT+CGEREP Packet Domain Event Reporting	
Test Command **AT+CGEREP=?**	Response **+CGEREP: (**range of supported **<mode>**s**),(**list of supported **<bfr>**s**)** **OK**
Read Command **AT+CGEREP?**	Response **+CGEREP: <mode>,<bfr>** **OK**
Write Command **AT+CGEREP=mode[,<bfr>]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<mode>	Integer type. 0 Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode), otherwise forward them directly to the TE. 2 Buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available. Otherwise forward them directly to the TE.
<bfr>	Integer type. 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).

NOTE

The unsolicited result codes and the corresponding events are defined as follows:

1. **+CGEV: REJECT <PDP_type>,<PDP_addr>**: A network request for PDP context activation occurred when the MT was unable to report it to the TE with a **+CRING** unsolicited result code and was automatically rejected.
   Note: This event is not applicable for EPS.
2. **+CGEV: NW REACT <PDP_type>,<PDP_addr>,[<cid>]**: The network has requested a context reactivation. The **<cid>** used to reactivate the context is provided if known to the MT.
   Note: This event is not applicable for EPS.
3. **+CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The network has forced a context deactivation. The **<cid>** used to activate the context is provided if known to the MT.
4. **+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The mobile equipment has forced a context deactivation. The **<cid>** used to activate the context is provided if known to the MT.
5. **+CGEV: NW DETACH**: The network has forced a Packet Domain detach. This implies that all active contexts have been deactivated. These are not reported separately.
6. **+CGEV: ME DETACH**: The mobile equipment has forced a Packet Domain detach. This implies that all active contexts have been deactivated. These are not reported separately.
7. **+CGEV: NW CLASS <class>**: The network has forced a change of MS class. The highest available class is reported (see **AT+CGCLASS**).
8. **+CGEV: ME CLASS <class>**: The mobile equipment has forced a change of MS class. The highest available class is reported (see **AT+CGCLASS**).
9. **+CGEV: PDN ACT <cid>**: Activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS.
10. **+CGEV: PDN DEACT <cid>**: Deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS.

Example

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

OK
AT+CGEREP?
+CGEREP: 0,0

OK
```

9.13. AT+CGSMS Select Service for MO SMS Messages

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

AT+CGSMS Select Service for MO SMS Messages	
Test Command **AT+CGSMS=?**	Response **+CGSMS: (**list of currently available **<service>**s**)** **OK**
Read Command **AT+CGSMS?**	Response **+CGSMS: <service>** **OK**
Write Command **AT+CGSMS=[<service>]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<service>	Integer type. The service or service preference to be used. 0 GPRS 1 Circuit switch 2 GPRS preferred (use circuit switched if GPRS not available) 3 Circuit switch preferred (use GPRS if circuit switched not available)
<err>	Error codes. See ***Chapter 11.5*** for details.

9.14. AT+QGDCNT Packet Data Counter

This command allows the application to check how many bytes have been sent out or received by the module.

AT+QGDCNT	Packet Data Counter
Test Command **AT+QGDCNT=?**	Response **+QGDCNT: (**list of supported **<op>**s**)** **OK**
Read Command **AT+QGDCNT?**	Response **+QGDCNT: <bytes_sent>,<bytes_recv>** **OK**
Write Command **AT+QGDCNT=<op>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<op>	Integer type. The operation about data counter. 0 Reset the data counter 1 Save the results of data counter to NV If the results need to be automatically saved, see **AT+QAUGDCNT**.
<bytes_sent>	Integer type. The amount of sent bytes.
<bytes_recv>	Integer type. The amount of received bytes.
<err>	Error codes. See ***Chapter 11.5*** for details.

NOTE

When the module is powered on, **<bytes_sent>** and **<bytes_recv>** is loaded from results of data counter in NV. The default result in NV is 0.

Example

```
AT+QGDCNT=?          //Test command
+QGDCNT: (0,1)

OK
AT+QGDCNT?           //Query the current bytes sent and received
+QGDCNT: 3832,4618

OK
AT+QGDCNT=1          //Save the results to NV
OK
AT+QGDCNT=0          //Reset counter
OK
```

9.15. AT+QAUGDCNT Auto Save Packet Data Counter

This command allows **AT+QGDCNT** to save results to NV automatically.

AT+QAUGDCNT Auto Save Packet Data Counter	
Test Command **AT+QAUGDCNT=?**	Response **+QAUGDCNT: (**list of supported **<value>**s**)** **OK**
Read Command **AT+QAUGDCNT?**	Response **+QAUGDCNT: <value>** **OK**
Write Command **AT+QAUGDCNT=<value>**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<value>	Integer type. The time-interval for **AT+QGDCNT** to save results to NV automatically. If it is set to 0, auto-save feature would be disabled. Range: 0, 30–65535. Default value: 0. Unit: second.
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QAUGDCNT=?          //Test command
+QAUGDCNT: (0,30-65535)

OK
AT+QGDCNT=35           //Set time-interval for AT+QGDCNT to save results to NV automatically
OK
AT+QAUGDCNT?           //Query the interval of auto-save
+QAUGDCNT: 35

OK
```

9.16. AT+QNETDEVCTL Connect USB Netcard to Network

This command connects USB netcard to network.

AT+QNETDEVCTL Connect USB Netcard to Network	
Test Command **AT+QNETDEVCTL=?**	Response **+QNETDEVCTL: (**range of supported **<type>**s**),(**range of supported **<cid>**s**),(**list of supported **<URC_en>**s**)** **OK**
Read Command **AT+QNETDEVCTL?**	Response **+QNETDEVCTL: <type>,<cid>,<URC_en>,<state>** **OK**
Write Command **AT+QNETDEVCTL=<type>,<cid>[,<URC_en>]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	2 s

Characteristics	The command takes effect immediately. The configurations will be saved automatically if **<type>**=3.

Parameter

<type>	Integer type. Operation mode 0 Do not connect to network 1 Connect to network for once 3 Connect to network automatically
<cid>	Integer type. PDP context identifier. Range: 1–15. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command.
<URC_en>	Integer type. Whether to enable the URC **+QNETDEVSTATUS: <status>** showing the netcard status. 0 Disable 1 Enable
<status>	Integer type. Netcard status. 0 The netcard is disconnected from the network 1 The netcard is connected to the network
<state>	Integer type. The result of connecting network. 0 Failed 1 Successful
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+QNETDEVCTL=?                 //Test command.
+QNETDEVCTL: (0,1,3) ,(1-15), (0-1)

OK
AT+QNETDEVCTL=1,1               //Set USB netcard connecting to network through context ID 1.
OK
AT+QNETDEVCTL?                  //Query USB netcard status.
+QNETDEVCTL: 1,1,1,1

OK
```

10 Hardware Related Commands

10.1. AT+QPOWD Power Off

This command shuts down the module. The UE returns **OK** immediately when the command is executed, then the UE deactivates the network. After it is completed, the UE outputs **POWERED DOWN** and enters into the shutdown state. The maximum time for unregistering network is 60 seconds. To avoid data loss, UE is not allowed to turn power off before the module's STATUS pin is set to low or the URC **POWERED DOWN** is outputted.

AT+QPOWD Power Off	
Test Command **AT+QPOWD=?**	Response **+QPOWD: (**list of supported **<n>**s**)** **OK**
Execution Command **AT+QPOWD[=<n>]**	Response **OK** **POWERED DOWN**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<n>	Integer type. 0 Immediately power down 1 Normal power down

10.2. AT+CCLK Clock

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

AT+CCLK Clock	
Test Command **AT+CCLK=?**	Response **OK**
Read Command **AT+CCLK?**	Response **+CCLK: <time>** **OK**
Write Command **AT+CCLK=<time>**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<time>	String type. The format is "yy/MM/dd,hh:mm:ss±zz", indicating year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range: -48 to +56), e.g. May 6th, 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08".
<err>	Error codes. See ***Chapter 11.5*** for details.

Example

```
AT+CCLK?                          //Query the local time
+CCLK: "08/01/04,00:19:43+00"

OK
```

10.3. AT+QADC Read ADC Value

This command reads the voltage value of ADC channel.

AT+QADC Read ADC Value	
Test Command **AT+QADC=?**	Response **+QADC: (**list of supported **<port>**s**)** **OK**
Read Command **AT+QADC=<port>**	Response **+QADC: <status>,<value>** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<port>	Integer type. Channel number of the ADC. 0 ADC channel 0 1 ADC channel 1
<status>	Integer type. Whether the ADC value is read successfully. 0 Fail 1 Success
<value>	Integer type. The voltage of specified ADC channel. Unit: mV.

10.4. AT+QSCLK Enable/Disable Sleep Mode

This command controls whether the module can enter into sleep mode. When sleep mode is enabled with the DTR pin being pulled up, the module directly enters into sleep mode. If sleep mode is enabled with the DTR pin being pulled down, there is a need to pull the DTR pin up first before the module can enter into sleep mode.

AT+QSCLK Enable/Disable Sleep Mode	
Test Command **AT+QSCLK=?**	Response **+QSCLK: (**list of supported **<n>**s**)** **OK**
Read Command	Response

AT+QSCLK?	**+QSCLK: <n>** **OK**
Write Command **AT+QSCLK=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.
Reference Quectel	

Parameter

<n>	Integer type. 0 Disable 1 Enable. It is controlled by DTR.

10.5. AT+CBC Battery Charge

This command returns battery connection status **<bcs>** and battery charge level **<bcl>** of the MT.

AT+CBC Battery Charge	
Test Command **AT+CBC=?**	Response **+CBC: (**list of supported **<bcs>**s**),(**range of supported **<bcl>**s**),<voltage>** **OK**
Execution Command **AT+CBC**	Response **+CBC: <bcs>,<bcl>,<voltage>** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

<bcs>	Integer type. Charge status. 0 ME is not charging 2 Charging has finished
<bcl>	Integer type. 0 Battery is exhausted, or MT does not have a battery connected 1–100 Battery has 1–100 percent of capacity remaining
<voltage>	Integer type. Battery voltage. Unit: mV.
<err>	Error codes. See ***Chapter 11.5*** for details.

11 Appendixes

11.1. Terms and Abbreviation

Table 5: Terms and Abbreviations

Abbreviation	Description
3GPP	3rd Generation Partnership Project
ACK	Acknowledge Character
ACM	Accumulated Call Meter
ADC	Analog-to-Digital Converter
ADF	Application DF
AMR	Adaptive Multi-Rate
APN	Access Point Name
ASCII	American Standard Code for Information Interchange
AUX	Auxiliary
BAIC	Bar All Incoming Calls
BAOC	Bar All Outgoing Calls
BCD	Binary-Coded Decimal
BIC-Roam	Bar Incoming Calls when Roaming outside the home country
BOIC	Bar Outgoing International Calls
BOIC-exHC	Bar Outgoing International Calls except to Home Country
CBS	Cell Broadcast Service

CBM	Cell Broadcast Message
CR	Carriage Return
CS	Circuit Switching
CSD	Circuit Switch Data
CUG	Closed User Group
DCD	Data Carrier Detection
DCE	Data Communication Equipment
DCS	Data Coding Scheme
DHCP	Dynamic Host Configuration Protocol
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
ECT	Explicit Call Transfer supplementary service
EDGE	Enhanced Data Rate for GSM Evolution
EGPRS	Enhanced General Packet Radio Service
EPS	Evolved Packet System
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
FDD	Frequency Division Duplexing
GBK	Chinese Internal Code Specification
GERAN	GSM EDGE Radio Access Network
GGSN	Gateway GPRS Support Node
GMM	GPRS Mobility Management
GMT	Greenwich Mean Time
GPIO	General-Purpose Input/Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications

HEX	Hexadecimal
HLR	Home Location Register
HSDPA	High Speed Downlink Packet Access
HSPA+	High-Speed Packet Access+
HSUPA	High Speed Uplink Packet Access
I2C	Inter-Integrated Circuit
ICCID	Integrated Circuit Card Identifier
ID	Identity
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
IRA	International Reference Alphabet (7-bit coded character set)
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
LF	Line Feed
LLC	Logical Link Control
LTE	Long Term Evolution
MAX	Maximum
ME	Mobile Equipment
MS	Mobile Station
MSISDN	Mobile Subscriber International ISDN/PSTN number
NAS	Non-Access-Stratum
NITZ	Network Identity and Time Zone
NSAPI	Network Service Access Point Identifier

NVRAM	Non-Volatile Random Access Memory
PB	Phone Book
PC	Personal Computer
PCM	Pulse Code Modulation
P-CSCF	Proxy-Call Session Control Function
PDN	Packet Data Network
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PH-CORP	Corporate Personalization
PH-FSIM	Phone-to-very first SIM card
PH-NET	Network Personalization
PH-NETSUB	Network Subset Personalization
PH-SIM	Phone to SIM Card
PH-SP	Service Provider Personalization
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PPP	Point to Point Protocol
PS	Packet Switching
PSC	Primary Synchronization Code
PUK	Personal Identification Number Unlock Key
QoS	Quality of Service
RDI	Restricted Digital Information
RF	Radio Frequency
RI	Ring Indicator
RTC	Real Time Clock

RTS/CTS	Request To Send/Clear To Send
RXQUAL	Receiver Quality
SAP	Service Access Point
SC	Switch Center
SDU	Service Data Unit
SM	Session Management
SMS	Short Message Service
SMSC	Short Message Service Center
SNDCP	SubNetwork Dependent Convergence Protocol
TA	Terminal Adapter
TCP	Transmission Control Protocol
TDD	Time Division Duplexing
TE	Terminal Equipment
TTS	Text To Speech
UART	Universal Asynchronous Receiver/Transmitter
UCS2	Unicode-2
UDH	User Data Header
UDP	User Datagram Protocol
UE	User Equipment
UICC	Universal Integrated Circuit Card
UMTS	Universal Mobile Telecommunications System
URC	Unsolicited Result Code
USB	Universal Serial Bus
(U)SIM	Universal Subscriber Identity Module
UTRAN	UMTS Terrestrial Radio Access Network

VBAT	Voltage of Battery
VLR	Visitor Location Register
WCDMA	Wideband Code Division Multiple Access

11.2. Factory Default Settings Restorable with AT&F

Table 6: Factory Default Settings Restorable with AT&F

AT Command	Parameters	Factory Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATS3	<n>	13
ATS4	<n>	10
ATS5	<n>	8
ATS6	<n>	2
ATS7	<n>	0
ATS8	<n>	2
ATS10	<n>	15
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+CREG	<n>	0
AT+CGREG	<n>	0

11.3. AT Command Settings Storable with AT&W

Table 7: AT Command Settings Storable with AT&W

AT Command	Parameters	Display with AT&V
ATE	<value>	Yes
ATQ	<n>	Yes
ATV	<value>	Yes
ATX	<value>	Yes
AT&C	<value>	Yes
AT&D	<value>	Yes
AT+IPR	<rate>	No
AT+CREG	<n>	No
AT+CGREG	<n>	No

11.4. AT Command Settings Storable with ATZ

Table 8: AT Command Settings Storable with ATZ

AT Command	Parameters	Factory Defaults
ATE	<value>	1
ATQ	<n>	0
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2

AT+CREG	<n>	0
AT+CGREG	<n>	0

11.5. Summary of CME ERROR and CMS ERROR Codes

11.5.1. CME ERROR Codes

Final result code **+CME ERROR: <err>** indicates an error related to mobile equipment or network. The operation is similar to **ERROR** result code. None of the following commands in the same command line is executed. Neither **ERROR** nor **OK** result code shall be returned.

<err> values are mostly used by common message commands. The following table lists most of general and GRPS related **ERROR** codes. For some GSM protocol failure cause described in GSM specifications, the corresponding **ERROR** codes are not included.

Table 9: Different Coding Schemes of +CME ERROR: <err>

Code of <err>	Meaning
0	Phone failure
1	No connection to phone
2	Phone-adaptor 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	(U)SIM not inserted
11	(U)SIM PIN required
12	(U)SIM PUK required
13	(U)SIM failure

14	(U)SIM busy
15	(U)SIM wrong
16	Incorrect password
17	(U)SIM PIN2 required
18	(U)SIM PUK2 required
20	Memory full
21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network 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
901	Audio unknown error

902	Audio invalid parameters
903	Audio operation not supported
904	Audio device busy

11.5.2. CMS ERROR Codes

Final result code **+CMS ERROR: <err>** indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same command line is executed. Neither **ERROR** nor **OK** result code shall be returned.

<err> values are mostly used by common message commands:

Table 10: Different Coding Schemes of +CMS ERROR: <err>

Code of <err>	Meaning
300	ME failure
301	SMS ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode
305	Invalid text mode
310	(U)SIM not inserted
311	(U)SIM pin necessary
312	PH SIM pin necessary
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required

318	(U)SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network
332	Network timeout
500	Unknown
512	(U)SIM not ready
513	Message length exceeds
514	Invalid request parameters
515	ME storage failure
517	Invalid service mode
528	More message to send state error
529	MO SMS is not allowed
530	GPRS is suspended
531	ME storage full

11.6. Summary of URC

Table 11: Summary of URC

Index	URC Display	Meaning	Condition
1	+CREG: <stat>	Indicate registration status of the ME	AT+CREG=1
2	+CREG: <stat>[,<lac>,<ci>[,<AcT>]]	After cell neighborhood changing shows whether the network has currently indicated the registration of	AT+CREG=2

		the ME, with location area code	
3	+CGREG: <stat>	Indicate network registration status of the ME	AT+CGREG=1
4	+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]	Indicate network registration and location information of the ME	AT+CGREG=2
5	+CTZV: <tz>	Time zone reporting	AT+CTZR=1
6	+CTZE: <tz>,<dst>,<time>	Extended time zone reporting	AT+CTZR=2
7	+CMTI: <mem>,<index>	New message is received, and saved to memory	See AT+CNMI
8	+CMT: [<alpha>],<length><CR><LF><pdu>	New short message is received and output directly to TE (PDU mode)	See AT+CNMI
9	+CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>	New short message is received and output directly to TE (Text mode)	See AT+CNMI
10	^HCMT: <oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>	New short message is received and output directly to TE	See AT+CNMI
11	+CBM: <length><CR><LF><pdu>	New CBM is received and output directly (PDU mode)	See AT+CNMI
12	+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>	New CBM is received and output directly to TE (Text mode)	See AT+CNMI
13	+CDS: <length><CR><LF><pdu>	New CDS is received and output directly (PDU mode)	See AT+CNMI
14	+CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>	New CDS is received and output directly to TE (Text mode)	See AT+CNMI
15	+CDSI: <mem>,<index>	New message status report is received, and saved to memory	See AT+CNMI
16	^HCDS: <oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>	New CDS is received and output directly to TE	See AT+CNMI
17	+CUSD: <status>[,<rspstr>,[<dcs>]]	USSD response from the network, or a network initiated operation	AT+CUSD=1
18	RDY	ME initialization is successful	N/A
19	+CFUN: 1	All function of the ME is available	N/A
20	+CPIN: <state>	(U)SIM card pin state	N/A

21	+QIND: SMS DONE	SMS initialization finished	N/A
22	+QIND: PB DONE	Phonebook initialization finished	N/A
23	POWERED DOWN	Module power down	AT+QPOWD
24	+CGEV: REJECT <PDP_type>,<PDP_addr>	A network request for PDP activation, and was automatically rejected.	AT+CGEREP=2,1
25	+CGEV: NW REACT <PDP_type>,<PDP_addr>, [<cid>]	The network request PDP reactivation	AT+CGEREP=2,1
26	+CGEV: NW DEACT <PDP_type>,<PDP_addr>, [<cid>]	The network has forced a context deactivation	AT+CGEREP=2,1
27	+CGEV: ME DEACT <PDP_type>,<PDP_addr>, [<cid>]	The ME has forced a context deactivation.	AT+CGEREP=2,1
28	+CGEV: NW DETACH	The network has forced a Packet Domain detach.	AT+CGEREP=2,1
29	+CGEV: ME DETACH	The mobile equipment has forced a Packet Domain detach.	AT+CGEREP=2,1
30	+CGEV: NW CLASS <class>	The network has forced a change of MS class.	AT+CGEREP=2,1
31	+CGEV: ME CLASS <class>	The mobile equipment has forced a change of MS class.	AT+CGEREP=2,1

11.7. SMS Character Sets Conversions

In *3GPP TS 23.038* DCS defined three kinds of alphabets in SMS, GSM 7 bit default alphabet, 8 bit data and UCS2 (16 bit). **AT+CSMP** can set the DCS in text mode (**AT+CMGF=1**). In text mode, DCS and **AT+CSCS** determine the way of SMS text input or output.

Table 12: The Way of SMS Text Input or Output

DCS	AT+CSCS	The Way of SMS Text Input or Output
GSM 7 bit	GSM	Input or output GSM character sets.
GSM 7 bit	IRA	Input or output IRA character sets. Input: UE converts IRA characters to GSM characters. Output: UE converts GSM characters to IRA characters.
GSM 7 bit	UCS2	Input or output a hex string similar to PDU mode. So only support characters 0-’ and A-F. Input: UE converts the UCS2 hex string to GSM characters.

		Output: UE converts the GSM characters to UCS2 hex string.
UCS2	-	Ignore the value of **AT+CSCS,** input or output a hex string similar to PDU mode. So only support characters 0-9 and A-F.
8 bit	-	Ignore the value of **AT+CSCS,** input or output a hex string similar to PDU mode. So only support characters 0-9 and A-F.

When DCS=GSM 7 bit, the input or output needs conversion. The detailed conversion tables are shown as below.

Table 13: The Input Conversions Table (DCS=GSM 7 bit and AT+CSCS="GSM")

	0	1	2	3	4	5	6	7
0	00	10	20	30	40	50	60	70
1	01	11	21	31	41	51	61	71
2	02	12	22	32	42	52	62	72
3	03	13	23	33	43	53	63	73
4	04	14	24	34	44	54	64	74
5	05	15	25	35	45	55	65	75
6	06	16	26	36	46	56	66	76
7	07	17	27	37	47	57	67	77
8	08	18	28	38	48	58	68	78
9	09	19	29	39	49	59	69	79
A	0A	Submit	2A	3A	4A	5A	6A	7A
B	0B	Cancel	2B	3B	4B	5B	6B	7B
C	0C	1C	2C	3C	4C	5C	6C	7C
D	0D	1A	2D	3D	4D	5D	6D	7D
E	0E	1E	2E	3E	4E	5E	6E	7E
F	0F	1F	2F	3F	4F	5F	6F	7F

Table 14: The Output Conversions Table (DCS=GSM 7 bit and AT+CSCS="GSM")

	0	1	2	3	4	5	6	7
0	00	10	20	30	40	50	60	70
1	01	11	21	31	41	51	61	71
2	02	12	22	32	42	52	62	72
3	03	13	23	33	43	53	63	73
4	04	14	24	34	44	54	64	74
5	05	15	25	35	45	55	65	75
6	06	16	26	36	46	56	66	76
7	07	17	27	37	47	57	67	77
8	08	18	28	38	48	58	68	78
9	09	19	29	39	49	59	69	79
A	0D0A		2A	3A	4A	5A	6A	7A
B	0B		2B	3B	4B	5B	6B	7B
C	0C	1C	2C	3C	4C	5C	6C	7C
D	0D	1A	2D	3D	4D	5D	6D	7D
E	0E	1E	2E	3E	4E	5E	6E	7E
F	0F	1F	2F	3F	4F	5F	6F	7F

Table 15: GSM Extended Characters

	0	1	2	3	4	5	6	7
0					1B40			
1								
2								
3								
4		1B14						

5							
6							
7							
8		1B28					
9		1B29					
A							
B							
C			1B3C				
D			1B3D				
E			1B3E				
F		1B2F					

Table 16: The Input Conversions Table (DCS=GSM 7 bit and AT+CSCS="IRA")

	0	1	2	3	4	5	6	7
0		20	20	30	00	50	20	70
1	20	20	21	31	41	51	61	71
2	20	20	22	32	42	52	62	72
3	20	20	23	33	43	53	63	73
4	20	20	02	34	44	54	64	74
5	20	20	25	35	45	55	65	75
6	20	20	26	36	46	56	66	76
7	20	20	27	37	47	57	67	77
8	backspace	20	28	38	48	58	68	78
9	20	20	29	39	49	59	69	79
A	0A	Submit	2A	3A	4A	5A	6A	7A
B	20	Cancel	2B	3B	4B	1B3C	6B	1B28

C	20	20	2C	3C	4C	1B2F	6C	1B40
D	0D	20	2D	3D	4D	1B3E	6D	1B29
E	20	20	2E	3E	4E	1B14	6E	1B3D
F	20	20	2F	3F	4F	11	6F	20

Table 17: IRA Extended Characters

	A	B	C	D	E	F
0	20	20	20	20	7F	20
1	40	20	20	5D	20	7D
2	20	20	20	20	20	08
3	01	20	20	20	20	20
4	24	20	5B	20	7B	20
5	03	20	0E	20	0F	20
6	20	20	1C	5C	1D	7C
7	5F	20	09	20	20	20
8	20	20	20	0B	04	0C
9	20	20	1F	20	05	06
A	20	20	20	20	20	20
B	20	20	20	20	20	20
C	20	20	20	5E	07	7E
D	20	20	20	20	20	20
E	20	20	20	20	20	20
F	20	60	20	1E	20	20

Table 18: The Output Conversions Table (DCS=GSM 7 bit and AT+CSCS="IRA")

	0	1	2	3	4	5	6	7
0	40	20	20	30	A1	50	BF	70
1	A3	5F	21	31	41	51	61	71
2	24	20	22	32	42	52	62	72
3	A5	20	23	33	43	53	63	73
4	E8	20	A4	34	44	54	64	74
5	E9	20	25	35	45	55	65	75
6	F9	20	26	36	46	56	66	76
7	EC	20	27	37	47	57	67	77
8	F2	20	28	38	48	58	68	78
9	C7	20	29	39	49	59	69	79
A	0D0A		2A	3A	4A	5A	6A	7A
B	D8		2B	3B	4B	C4	6B	E4
C	F8	C6	2C	3C	4C	D6	6C	F6
D	0D	E6	2D	3D	4D	D1	6D	F1
E	C5	DF	2E	3E	4E	DC	6E	FC
F	E5	C9	2F	3F	4F	A7	6F	E0

Table 19: GSM Extended Characters

	0	1	2	3	4	5	6	7
0					7C			
1								
2								
3								
4		5E						

5			
6			
7			
8	7B		
9	7D		
A			
B			
C		5B	
D		7E	
E		5D	
F	5C		

Because the low 8 bits of UCS2 character is the same as the IRA character:

The conversion table of DCS = GSM 7 bit and **AT+CSCS="UCS2"** is similar to **AT+CSCS="IRA"**.
The conversion table of fmt = GSM 7 bit and **AT+CSCS="GSM"** is similar to **AT+CSCS="GSM"**.
The conversion table of fmt = GSM 7 bit and **AT+CSCS="IRA"** is similar to **AT+CSCS="IRA"**.
The conversion table of fmt = GSM 7 bit and **AT+CSCS="UCS2"** is similar to **AT+CSCS="IRA"**.

The difference is the way of SMS text input or output. See ***Table 12*** for more details.

11.8. Release Cause Text List of AT+CEER

Table 20: Release Cause Text List of AT+CEER

Release Cause Text List of AT+CEER
0 Unknown
1 Unassigned number
3 No route to destination
6 Channel unacceptable

8 Operator determined barring
16 Normal call clearing
17 User busy
18 No user responding
19 User alerting: no answer
21 Call rejected
22 Number changed
25 Preemption
26 Non selected user clearing
27 Destination out of order
28 Invalid integer type
29 Facility rejected
30 Response to STATUS ENQUIRY
31 Normal: unspecified
34 No circuit/channel available
38 Network out of order
41 Temporary failure
42 Switching equipment congestion
43 Access information discarded
44 Requested circuit/channel unavailable
47 Resource unavailable
49 QoS unavailable
50 Requested facility not subscribed
55 Incoming calls barred within CUG
57 Bearer capability not authorized
58 Bearer capability not available
63 Service not available
65 Bearer service not implemented

68 ACM MAX reached
69 Facility not implemented
70 Only RDI bearer capability available
79 Service not implemented
81 Invalid transaction ID
87 User not member of CUG
88 Incompatible destination
95 Incorrect message
91 Invalid transit network selection
97 Message type non-existent
98 Message type wrong state
99 Information element not-existent
100 Conditional IE error
101 Message wrong state
102 Recovery after timer expiry
111 Protocol error: unspecified
127 Interworking: unspecified