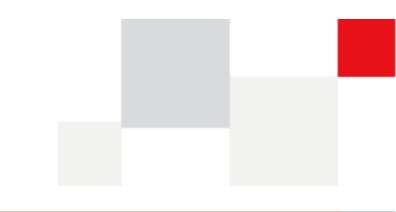# EC200U&EG915U Series
AT Commands Manual

LTE Standard Module Series

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About the Document

Revision History

Version	Date	Author	Description
-	2021-03-08	Fei XUE/ Braden HE/ Marvin NING/ Kevin WANG/ Herry GENG	Creation of the document
1.0	2021-11-01	Fei XUE/ Braden HE/ Marvin NING/ Kevin WANG/ Herry GENG	First official release

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Table Index

1 Introduction

1.1. Scope of the Document

This document presents the AT command set supported by Quectel EC200U and EG915U series modules.

1.2. Definitions

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

1.3. 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 EC200U and EG915U series modules 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.

1.4. Supported Character Sets

The AT command interface of EC200U and EG915U series modules default to the **GSM** character set. EC200U and EG915U series modules support the following character sets:

- GSM format
- UCS2
- IRA

The character set can be configured and interrogated by using the **AT+CSCS** (*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 phonebook entries text field.

1.5. AT Command Interface

EC200U and EG915U series modules AT command interface includes two USB ports (USB MODEM port and USB AT port) and one main UART port. The main UART port and two USB ports 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 the EC200U and EG915U series modules 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, 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**, do not enter any other AT commands. The module outputs message, **POWERED DOWN** and sets the STATUS pin as low to enter into the shutdown state. In order to avoid data loss, it is suggested to wait for 1s to switch off the VBAT after the STATUS pin is set as low and the URC **POWERED DOWN** is outputted. If **POWERED DOWN** has not been received after 65s, the VBAT 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, or that they should be executed in a given sequence.

2 General Commands

2.1. ATI   Display Product Identification Information

This command delivers the 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
EC200U
Revision: EC200UCNAAR01A04M08

OK
```

2.2. AT+GMI Request Manufacturer Identification

This command returns the manufacturer identification text. It is identical with **AT+CGMI**.

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**.

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 Firmware Revision Identification

This command delivers the product firmware version identification text. It is identical with **AT+CGMR**.

AT+GMR Request TA Firmware Revision Identification	
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 TA firmware version.

Example

```
AT+GMR
EC200UCNAAR01A04M08

OK
```

2.5. AT+CGMI Request Manufacturer Identification

This command returns the manufacturer identification text. It is identical with **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 the product model identification text. It is identical with **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

<revision> String type. Identification of the device type.

2.7. AT+CGMR Request TA Firmware Revision Identification

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

AT+CGMR Request TA Firmware Revision Identification	
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 text of TA firmware version.

2.8. AT+GSN Request International Mobile Equipment Identity and Serial Number

This command returns the International Mobile Equipment Identity (IMEI) number and Serial Number (SN) of ME. It is identical with **AT+CGSN**.

AT+GSN Request International Mobile Equipment Identity and Serial Number	
Test Command **AT+GSN=?**	Response **+GSN: (**list of supported **<snt>**s**)** **OK**
Write Command **AT+GSN=<snt>**	Response If **<snt>**=0, query SN of the ME: **+GSN: <SN>** **OK** If **<snt>**=1, query IMEI of the ME: **+GSN: <IMEI>** **OK**
Execution Command **AT+GSN**	Response **<IMEI>** **OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/
Reference	

3GPP TS 27.007	

Parameter

\<snt\>	Integer type. Control to query SN or IMEI of the ME.
	0 Query SN of the ME
	1 Query IMEI of the ME
\<SN\>	String type. SN of the ME.
\<IMEI\>	String type. IMEI of the ME.
\<err\>	Error codes. For more details, please refer to **Chapter 14.6**.

NOTE

The serial number or IMEI varies with the individual ME.

2.9. AT+CGSN Request International Mobile Equipment Identity and Serial Number

This command returns the International Mobile Equipment Identity (IMEI) number and Serial Number (SN) of ME. It is identical with **AT+GSN**.

AT+CGSN	Request International Mobile Equipment Identity and Serial Number
Test Command **AT+CGSN=?**	Response **+CGSN: (**list of supported **\<snt\>**s**)** **OK**
Write Command **AT+CGSN=\<snt\>**	Response If **\<snt\>**=0, query SN of the ME: **+CGSN: \<SN\>** **OK** If **\<snt\>**=1, query IMEI of the ME: **+CGSN: \<IMEI\>** **OK**
Execution Command **AT+CGSN**	Response **\<IMEI\>** **OK**

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

Parameter

<snt>	Integer type. Control to query SN or IMEI of the ME.
	0 Query SN of the ME
	1 Query IMEI of the ME
<SN>	String type. SN of the ME.
<IMEI>	String type. IMEI of the ME.
<err>	Error codes. For more details, please refer to *Chapter 14.6*.

NOTE

The serial number or IMEI varies with the individual ME.

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

This command restores AT command settings to the factory defaults (See *Table 9*).

AT&F Restore 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.
	<u>0</u> Set AT commands 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 otherwise.

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 S7: 0
OK

2.12. AT&W   Store Current Settings to User-defined Profile

This command stores the current AT command settings to a user-defined profile in non-volatile memory (See *Table 10*).

AT&W Store Current Settings to User-defined Profile	
Execution Command **AT&W[<n>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

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

2.13. ATZ   Restore AT Command Setting from User-defined Profile

This command restores the current AT command settings to the user-defined profile in non-volatile memory, if they have been stored with **AT&W** before (See *Table 11*). Any additional AT command on the same command line may be ignored.

ATZ Restore AT Command Setting from User-defined Profile	
Execution Command **ATZ[<value>]**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

Parameter

<value>	Integer type.
	<u>0</u> Profile number to restore

2.14. ATQ   Set Result Code Echo 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 Echo Mode	
Execution Command **ATQ\<n\>**	Response If **\<n\>**=0: **OK** If **\<n\>**=1: (none)
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
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 result codes, their numeric equivalents and brief descriptions are listed in the following *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>**
	<u>1</u> 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: ATV0&ATV1 Result Codes Numeric Equivalents and Brief Description

ATV1	ATV0	Description
OK	0	Acknowledges execution of a command
CONNECT	1	A connection has been established; the DCE is moving 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, 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 TA echoes characters received from TE or not in 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
	<u>1</u>	Echo mode ON

2.17. A/   Repeat Previous Command Line

This command repeats previous AT command line, and "/" acts as the line feed character.

A/ Repeat Previous Command Line	
Execution Command **A/**	Response Repeat the previous command
Reference V.25ter	

Example

```
ATI
Quectel
EC200U
Revision: EC200UCNAAR01A04M08

OK
A/                                        //Repeat the previous command.
Quectel
EC200U
Revision: EC200UCNAAR01A04M08

OK
```

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

Parameter

\<n>   Integer type. Command line termination character. Range: 0–127. Default: 13.

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

Parameter

<n>	Integer type. Response formatting character. Range: 0–127. Default: 10.

2.20. ATS5   Set Command Line Editing Character

This command determines the value of editing character used by TA 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	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<n>	Integer type. Response editing character. Range: 0–127. Default: 8.

2.21. ATX   Set CONNECT Result Code Format and Monitor Call

Progress

This command determines whether the module transmits particular result codes to the 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 Only **CONNECT** result code returned, dial tone and busy detection are both disabled.
	1 Only **CONNECT\<text\>** result code returned, dial tone and busy detection are both disabled.
	2 **CONNECT\<text\>** result code returned, dial tone detection is enabled, and busy detection is disabled.
	3 **CONNECT\<text\>** result code returned, dial tone detection is disabled, and busy detection is enabled.
	<u>4</u> **CONNECT\<text\>** result code returned, and dial tone and busy detection are both enabled.

2.22. AT+CFUN   Set UE Functionality

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

AT+CFUN Set UE Functionality	
Test Command **AT+CFUN=?**	Response **+CFUN: (**list 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	The command takes effect immediately. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<fun>	Integer type.
	0 Minimum functionality
	<u>1</u> Full functionality
	4 Disable the ME from both transmitting and receiving RF signals (airplane mode)
<rst>	Integer type.
	<u>0</u> Do not reset the ME before setting it to **<fun>** functionality level.
	1 Reset the ME. The device is fully functional after the reset. This value is available only for **<fun>**=1
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

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,"CHINA MOBILE",7                    //Operator is registered.

OK
```

2.23. 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>**. This command disables or enables the use of final result code **+CME ERROR: <err>** as the indication of an error.

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	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type.	
	0	Disable result code
	1	Enable result code and use numeric values
	2	Enable result code and use verbose values

Example

```
AT+CMEE=0                        //Disable result code.
OK
AT+CPIN?
ERROR                            //Only ERROR is 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
```

2.24. AT+CSCS Select TE Character Set

This command informs the MT which character set is used by the TE. This enables the MT to convert character strings correctly between TE and MT 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	The command takes effect immediately.

	The configurations can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<chset>	String type.	
	"GSM"	GSM default alphabet
	"HEX"	Character strings consist only of hexadecimal numbers from 00 to FF.
	"PCCP936"	PC character set Code Page 936.
	"IRA"	International reference alphabet
	"UCS2"	UCS2 alphabet

Example

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

OK
AT+CSCS="UCS2"                  //Set the character set to "UCS2".
OK
AT+CSCS?
+CSCS: "UCS2"                   //The character set is UCS2 after the configuration.

OK
```

2.25. AT+QURCCFG Configure Output Port of URC

This command configures the output port of URC.

AT+QURCCFG Configure Output Port of URC	
Test Command **AT+QURCCFG=?**	Response **+QURCCFG:** "urcport",**(**list of supported **<urc_port_value>**s**)** **OK**
Write Command **AT+QURCCFG="urcport"[,<urc_port _value>]**	Response If the optional parameter is omitted, query the current configuration: **+QURCCFG:** "urcport",**<urc_port_value>** **OK**

	If the optional parameter is specified, configure 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
"uart2"	Debug UART
"uart3"	Third UART (Only valid when GNSS is not supported)
"usbnmea"	USB Serial Port1
"all"	All ports

Example

```
AT+QURCCFG=?
+QURCCFG: "urcport",("usbat","usbmodem","uart1","uart2","uart3","usbnmea","all")

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

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

OK
```

3 UART Control Commands

3.1. AT&C   Set DCD Function Mode

This command controls the behavior of the UE's DCD (data carrier detection) line.

AT&C Set DCD Function Mode	
Execution Command **AT&C[<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. It determines how the state of circuit (DCD) relates to the detection of received line signal from the distant end.
	0 DCD line is always ON
	1 DCD line is ON only in the presence of data carrier

3.2. AT&D   Set DTR Function Mode

This command determines how the TA 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	The command takes effect immediately. The configurations can be saved with **AT&W**.

Reference	
V.25ter	

Parameter

<value>	Integer type.
	0 TA ignores status on DTR
	1 Low→High on DTR: keep the connected all and change to command mode.
	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 UART for data mode.

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**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

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

> **NOTE**
>
> Flow control is only applicable for data mode.

Example

AT+IFC=2,2	//Enable the hardware flow control.
OK	
AT+IFC?	
+IFC: 2,2	
OK	

3.4. AT+ICF Set TE-TA Control Character Framing Format and Parity

This command determines the control character framing format and parity received by TA from TE.

AT+ICF Set TE-TA Control Character Framing Format and Parity	
Test Command **AT+ICF=?**	Response **+ICF: (**list of supported **<format>**s),(list of supported **<parity>**s) **OK**
Read Command **AT+ICF?**	Response **+ICF: <format>,<parity>** **OK**
Write Command **AT+ICF=[<format>,[<parity>]]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<format>	Integer type.	
	1	8 data, 2 stop
	2	8 data, 1 stop, 1 parity
	3	8 data, 1 stop, no parity
<parity>	Integer type.	
	0	Odd
	1	Even

NOTE

1. The command is applied for command state.
2. The **<parity>** field is omitted if the **<format>** field specifies no parity.

3.5. 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 configurations can be saved with **AT&W**.
Reference V.25ter	

Parameter

<rate>	String type. Baud rate per second. Unit: bps.
	2400
	4800
	9600
	14400
	19200
	28800
	33600
	38400
	57600
	<u>115200</u>
	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** cannot be restored with **AT&F** and **ATZ**; but it is still storable with **AT&W**.
3. In multiplex mode, the baud rate cannot be changed by the Write Command **AT+IPR=<rate>**; and the setting is invalid and cannot be stored even if **AT&W** is executed after the Write Command.
4. A selected baud rate takes effect after the Write Commands are executed and acknowledged by **OK**.

Example

AT+IPR=115200	//Set fixed baud rate to 115200 bps.
OK	
AT&W	//Store current setting, that is, the UART communication rate is 115200 bps after restarting 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   Mobile Equipment Activity Status

This command queries the module's activity status.

AT+CPAS 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 ME: **+CPAS: <pas>** **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

<pas>	Integer type. ME activity status.
	<u>0</u> Ready
	3 Ringing
	4 Call in progress or call hold
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

```
AT+CPAS
+CPAS: 0                              //The module is idle.

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　Extended Error Report

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

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

Parameter

<text>	Release cause text. Reason for the last call failure to setup or release (listed in ***Chapter 14.9***). 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. For more details, please refer to ***Chapter 14.5***.

4.3. AT+QINDCFG URC Indication Configuration

This command controls URC indication.

AT+QINDCFG URC Indication Configuration	
Test command **AT+QINDCFG=?**	Response **+QINDCFG: "all",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **+QINDCFG: "csq",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **+QINDCFG: "act",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **+QINDCFG: "smsfull",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **+QINDCFG: "smsincoming",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **+QINDCFG: "ring",(**list of supported **<enable>**s**),(**list of supported **<save_to_nvram>**s**)** **OK**
Write command **AT+QINDCFG=<urctype>[,<enable>[,<save_to_nvram>]]**	Response If the optional parameters are omitted, query the current configuration: **+QINDCFG: <urctype>,<enable>**

	OK
	If 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

Parameter

<urctype>	String type. URC type.

	"all"	Main switch of all URCs. Default: ON.
	"csq"	Indication of signal strength and channel bit error rate change (similar to **AT+CSQ**). Default: OFF. If this configuration is ON, present: **+QIND: "csq",<rssi>,<ber>**
	"smsfull"	SMS storage full indication. Default is OFF. If this configuration is ON, present: **+QIND: "smsfull",<storage>**
	"ring"	"RING" indication. Default: ON.
	"smsincoming"	Incoming message indication. Default: ON. Related URCs 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 string format. The values are as below: "GSM" "LTE" "UNKNOWN" The examples of URC are as below: **+QIND: "act","LTE"** **+QIND: "act","UNKOWN"** The description of "act" is as below: 1. If module does not register on network, the **<actvalue>** would be "UNKNOWN". 2. If this configuration is ON, the URC of "act" is reported immediately. Only when the network access technology changes, a new URC is reported.

\<enable\>	Integer type. URC indication is ON or OFF.
	0　　　　　OFF
	1　　　　　ON
\<save_to_nvram\>	Integer type. Whether to save configuration into NV.
	<u>0</u>　　Not save
	1　　Save
\<err\>	Integer type. For details, please refer to **Chapter 14.5**.

4.4.　AT+QCFG　Extended Settings

AT+QCFG　Extended Settings	
Test Command **AT+QCFG=?**	**+QCFG: "nwscanmode",(**list of supported **\<scan_mode\>**s)**,(**list of supported **\<effect\>**s) **+QCFG: "band", (**list of supported **\<bandval\>**s)**,(**list of supported **\<ltebandval\>**s)**,(**list of supported **\<effect\>**s) **+QCFG: "airplanecontrol",(**list of supported **\<enable\>**s**)** **+QCFG: "usbnet",(**list of supported **\<net\>**s) **+QCFG: "nat/cid",(**list of supported **\<cid\>**s) **+QCFG: "qoos",(**list of supported **\<enable\>**s)**,(**range of supported **\<time\>**s)**,(**range of supported **\<count\>**s)**,(**range of supported **\<maxlen\>**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/smsincoming",(**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/delay",(**range of supported **\<time\>**s) **+QCFG: "urc/cache",(**range of supported **\<enable\>**s) **+QCFG:　"risignaltype",(**list　of　supported **\<RI_signal_type\>**s) **+QCFG:　"cmux/urcport",(**range　of　supported **URC_port\>**s) **+QCFG: "tone/incoming",(**list of supported **\<enable\>**s) **+QCFG: "ledmode",(**list of supported **\<enable\>**s) **+QCFG: "fota/cid",(**range of supported **\<contextID\>**s) **+QCFG: "fota/times",(**range of supported **\<timeout\>**s) **+QCFG: "fota/path",\<dst\>** …

	OK
Maximum Response Time	300 ms
Characteristics	/

NOTE

The above only shows an example for the command response. The response of the command varies according to the actual module used.

4.4.1. 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>[,<effect>]]**	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	**<effect>** determines how the command takes effect. The configurations will be saved automatically.

Parameter

<scan_mode>	Integer type. Network mode.
	<u>0</u> Automatic (GSM/LTE)
	1 GSM only
	3 LTE only
<effect>	Integer type. Ways the command takes effect.
	0 The command takes effect after UE reboots.
	<u>1</u> The command takes effect immediately.
<err>	Error codes. For more details, please refer to **_Chapter 14.5_**.

NOTE

For the module that supports LTE only, the only default value of **<scan_mode>** is 3.

4.4.2. AT+QCFG="band"   Configure Bands to Be Searched

This command specifies the frequency bands to be searched by UE.

AT+QCFG="band" Configure Bands to Be Searched	
Write Command **AT+QCFG="band"[,<bandval>,<ltebandval>[,<effect>]]**	Response If optional parameters are omitted (that is, only execute **AT+QCFG="band"**), query the current configuration: **+QCFG: "band",<bandval>,<ltebandval>** **OK** If optional parameters are specified, configure the 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	**<effect>** determines how the command takes effect. The configurations will be saved automatically.

Parameter

\<bandval>	A hexadecimal value that specifies the GSM band. If it is set to 0, it means no change to GSM frequency bands. e.g.: 0003 = 0001 (EGSM900) + 0002 (DCS1800)

0	No change
0001	EGSM900
0002	DCS1800
0004	GSM850
0008	PCS1900
FFFF	Full frequency bands

\<ltebandval>	A hexadecimal value that specifies the LTE frequency band. If it is set to 0, it means no change to LTE frequency band. (e.g.: 0x15=0x1 (LTE B1) + 0x4 (LTE B3) + 0x10 (LTE B5))

0	No change
0x1 (CM_BAND_PREF_LTE_EUTRAN_BAND1)	LTE B1
0x2 (CM_BAND_PREF_LTE_EUTRAN_BAND2)	LTE B2
0x4 (CM_BAND_PREF_LTE_EUTRAN_BAND3)	LTE B3
0x8 (CM_BAND_PREF_LTE_EUTRAN_BAND4)	LTE B4
0x10 (CM_BAND_PREF_LTE_EUTRAN_BAND5)	LTE B5
0x40 (CM_BAND_PREF_LTE_EUTRAN_BAND7)	LTE B7
0x80 (CM_BAND_PREF_LTE_EUTRAN_BAND8)	LTE B8
0x80000 (CM_BAND_PREF_LTE_EUTRAN_BAND20)	LTE B20
0x8000000 (CM_BAND_PREF_LTE_EUTRAN_BAND28)	LTE B28
0x200000000 (CM_BAND_PREF_LTE_EUTRAN_BAND34)	LTE B34
0x2000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND38)	LTE B38
0x4000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND39)	LTE B39
0x8000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND40)	LTE B40
0x10000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND41)	LTE B41
0x20000000000000000 (CM_BAND_PREF_LTE_EUTRAN_BAND66)	LTE B66
0x7FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF(CM_BAND_PREF_ANY)	Full frequency bands

\<effect>	Integer type. Ways the command takes effect.

0	The command takes effect after UE reboots.
<u>1</u>	The command takes effect immediately.

\<err>	Error codes. For more details, please refer to ***Chapter 14.5***.

NOTE

1. Five LTE frequency bands are supported to be set at most. When **\<ltebandval>** is set to full frequency bands, all five bands can be unlocked. If more than five LTE frequency bands are set, error returns.
2. See the product specification of all applicable modules for specific frequency bands supported by each module.

4.4.3. AT+QCFG="airplanecontrol" Enable/Disable Airplane Mode Control via W_DISABLE#

This command enables or disables airplane mode via W_DISABLE#.

AT+QCFG="airplanecontrol" Enable/Disable Airplane Mode Control via W_DISABLE#	
Write Command **AT+QCFG="airplanecontrol"[,<enable>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "airplanecontrol",<enable>,<status>** **OK** If the optional parameter is specified, enable/disable airplane mode control via W_DISABLE#: **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Characteristics	The command takes effect immediately; The configuration will be saved automatically.

Parameter

<enable>	Integer type. Enable/disable the airplane mode control via W_DISABLE# pin.
	<u>0</u> Enable the airplane mode control via W_DISABLE# pin
	1 Disable the airplane mode control via W_DISABLE# pin
<status>	Integer type. airplane mode status.
	0 Out of airplane mode
	1 In airplane mode
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

1. After this command enables the airplane mode control via W_DISABLE# pin, and W_DISABLE# pin changes, URC **+QIND: airplanestatus,<status>** will be reported.
2. After this command enables the airplane mode control via W_DISABLE# pin, the module will enter airplane mode when W_DISABLE# pin is pulled down and the module will exit from the airplane mode when W_DISABLE# pin is pulled up. If W_DISABLE# pin is in low level, executing **AT+CFUN=1** will cause errors to not allow to exit from airplane mode.

3. After this command enables the airplane mode control via W_DISABLE# pin, the module will first detect the level of W_DISABLE# pin. if the pin level is low, the module enters airplane mode immediately.

4. See the hardware design of corresponding module for more details about W_DISABLE# pin.

Example

AT+QCFG="airplanecontrol"	//Query the current configuration.
+QCFG: "airplanecontrol",0,0	
OK	
AT+QCFG="airplanecontrol",1	//Turn on airplane mode control.
OK	
//Pull down W_DISABLE# pin	
+QIND: airplanestatus,1	//Enter airplane mode because W_DISABLE# pin is pulled down
AT+CFUN?	
+CFUN: 4	//In airplane mode.
OK	
//Pull up W_DISABLE# pin	
+QIND: airplanestatus,0	//Exit from airplane mode.
AT+CFUN?	
+CFUN: 1	//In full functionality mode.
OK	

4.4.4. AT+QCFG="usbnet" Configure USB Network Port Protocol

This command configures the protocol used by the USB network port.

AT+QCFG ="usbnet" Configure USB Network Port Protocol	
Write Command **AT+QCFG="usbnet"[,<net>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "usbnet",<net>** **OK** If the optional parameter is specified, configure the protocol used by the USB network port: **OK** Or

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

Parameter

<net>	Integer type. The protocol used by the USB network port.
	<u>1</u> ECM
	3 RNIDS
<err>	Error codes. For more details, please refer to ***Chapter 14.5***.

4.4.5.   AT+QCFG="nat/cid"   Enable NAT of PDP Context Identifier

This command enables the NAT function for the specified PDP context identifier.

AT+QCFG="nat/cid" Enable NAT of PDP Context Identifier	
Write Command **AT+QCFG="nat/cid"[,<cid>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "nat/cid",<cid>** **OK** If the optional parameter is specified, enable the NAT function for the specified PDP context identifier : **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR:<err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted; The configuration will be saved automatically.

Parameter

\<cid\>	A hexadecimal value. Each bit indicates whether PDP NAT function is enabled. This value takes 32 bits, and low 16 bits represents PDP CID of SIM0; high 16 bits represents PDP CID of SIM1. Each SIM card supports up to 7 PDPs. Bits[0:6] represent SIM0's PDP CID1–PDP CID7, and bits[16:22] represent SIM1's PDP CID1–PDP CID7.
\<err\>	Error codes. For more details, please refer to **Chapter 14.5**.

Example

AT+QCFG="nat/cid"	//Query the current configuration.
+QCFG: "nat/cid",0x0	
OK	
AT+QCFG="nat/cid",0x10005	//Enable SIM0's NAT for PDP CID1 and CID 3; Enable SIM0's NAT for PDP CID1.
OK	

4.4.6. AT+QCFG="qoos" Configure Network Search Timer Information in OOS State

This command configures the related parameters of no service timer and limited-service timer in OOS state.

AT+QCFG="qoos" Configure Network Search Timer Information in OOS State	
Write Command **AT+QCFG="qoos"[,\<enable\>[,\<time\>[, \<count\>[,\<maxlen\>]]]]**	Response If the optional parameters are omitted, query the current configuration: **+QCFG: "qoos",\<enable\>,\<time\>,\<count\>,\<maxlen\>** **OK** If the optional parameters are specified, configure network search timer information in OOS state: **OK** Or **+CME ERROR: \<err\>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately; The configuration will be saved automatically.

Parameter

\<enable>	Integer type. OOS mechanism.
	0 Disable OOS mechanism. Under no service or limited-service state, search the network according to the default logic.
	1 Enable OOS mechanism. Search the network only under no service state.
	2 Enable OOS mechanism. Search the network under no service or limited-service state.
\<time>	Integer type. The initial duration of the timer. Range: 0–255. Unit: second. Default value: 0.
\<count>	Integer type. Cycles. Range: 0–255. Default value: 0.
\<maxlen>	Integer type. The maximum duration of the timer. Range: 0–255. Unit: minute. Default value: 60.
\<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

1. When **\<enable>** is equal to 0, **\<time>**, **\<count>** and **\<maxlen>** should be omitted.
2. When **\<enable>** is equal to 0, **\<time>** is equal to 0, search the network according to the default logic.
3. If **\<enable>** is not equal to 0, and **\<count>** is equal to 0 or be omitted, the timer duration keeps the value to **\<time>**.
4. When **\<time>** and **\<count>** are non-zero, **\<maxlen>** must be greater than \<time>. When **\<maxlen>** is greater than **\<time>**, after the number of cycles reaches **\<count>**, the timer's next start time will be twice as long as this time, and the maximum will not exceed **\<maxlen>**; if **\<maxlen>** is omitted, the maximum time will not exceed 1 hour.
5. If **\<enable>** is returned as 0, **\<time>**, **\<count>** and **\<maxlen>** will be omitted.
6. The default network search logic: the timer duration is fixed as 12 seconds under no service state and the timer duration at first network search is 12 seconds under limited-service state, and after network searches for 5 times and there is no cell changed at this point, the duration is fixed as 1 hour.

Example

```
AT+QCFG="qoos",2,20,5,60    //Under no service or limited-service state, set the initial duration
                            of the timer to 20 seconds and the cycles to 5. The maximum
                            duration is 60 minutes.
OK
AT+QCFG="qoos",1,30,3,50    //Under no service state, set the initial duration of the timer to 30
                            seconds and cycles to 3. The maximum duration is 50 minutes.
OK
AT+QCFG="qoos",0            //Disable OOS mechanism, search the network according
                             to the default logic.
OK
```

4.4.7. AT+QCFG="urc/ri/other" Specify General URC RI Behavior

This command specifies the RI behavior when normal URC is reported.

AT+QCFG="urc/ri/other" Specify General URC RI Behavior	
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 are specified, specify general URC RI behavior: **OK** Or **ERROR** If error is 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

<typeRI>	String type. RI behavior when general URC is reported. "off no RI behavior "pulse" The pulse on RI. The cycle is determined by **<pulse_duration>**.
<pulse_duration>	Integer type. Pulse cycles. It is available only when **<typeRI>** is set to "pulse". Range: 1–2000. Default value: 120. Unit: milliseconds.
<pulse_count>	Integer type. Number of pulses. It is available only when **<typeRI>** is set to "pulse". The time interval between two adjacent pulses is **<pulse_duration>**. Range: 1–5.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.8. AT+QCFG="urc/ri/smsincoming" Specify SMS URC RI Behavior

This command specifies the RI behavior when SMS related URC is reported.

AT+QCFG="urc/ri/smsincoming"	Specify SMS URC RI Behavior
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 normal URC RI behavior: **OK** Or **ERROR** If error is 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

<typeRI>	String type. RI behavior when SMS related URC is reported. "off no RI behavior "pulse" The pulse on RI. The cycle is determined by **<pulse_duration>**.
<pulse_duration>	Integer type. Pulse cycles. It is available only when **<typeRI>** is set to "pulse". Range: 1–2000. Default value: 120. Unit: milliseconds.
<pulse_count>	Integer type. Number of pulses. It is available only when **<typeRI>** is set to "pulse". The time interval between two adjacent pulses is **<pulse_duration>**. Range: 1–5.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.9. AT+QCFG="urc/ri/ring" Specify Call Incoming URC RI Behavior

This command specifies the RI behavior when call incoming related URC is reported.

AT+QCFG="urc/ri/ring" Specify Call Incoming URC RI Behavior	
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 the optional parameters are specified, specify normal URC RI behavior **OK** Or **ERROR** If error is 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

<typeRI>	String type. RI behavior when call incoming related URC is reported. "off no RI behavior "pulse" The pulse on RI. The cycle is determined by **<pulse_duration>**.
<pulse_duration>	Integer type. Pulse cycles. It is available only when **<typeRI>** is set to "pulse". Range: 1–2000. Default value: 120. Unit: milliseconds.
<pulse_count>	Integer type. Number of pulses. It is available only when **<typeRI>** is set to "pulse". The time interval between two adjacent pulses is **<pulse_duration>**. Range: 1–5.
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

4.4.10. AT+QCFG="urc/delay"　Specify Delay of URC Indication

This command specifies the delay of URC indication starting from the end of RI pulse.

AT+QCFG="urc/delay"　Specify Delay of URC Indication	
Write Command **AT+QCFG="urc/delay"[,<time>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "urc/delay",<time>** **OK** If the optional parameter is specified, specify the delay of URC indication starting from the end of RI pulse: **OK** Or **ERROR** If error is 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

<time>	Integer type. The delay of URC indication starting from the end of RI pulse: It is valid only when the RI pulse is greater than or equal to 0. Range: 0–120. Unit: millisecond. Default value: 0, which means no delay.
<err>	Error codes. For more details, please refer to ***Chapter 14.5***.

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

This command enables/disables URC cache.

AT+QCFG="urc/cache"　Enable/Disable URC Cache	
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: **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. Disable/Enable URC cache. After enabling the URC cache, all URCs will be cached. And URC will not be output until the URC cache is disabled. <u>0</u> Disable URC cache 1 Enable URC cache
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

4.4.12. 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 setting: **+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	This command takes effect immediately. The configuration will be saved automatically.

Parameter

<RI_signal_type>	String type. RI signal output carrier.	
	"respective"	RI signal output to URC port.
		If URC is output to main UART, the RI signal is output to the RI pin of the main UART.
		If URC is output to non-main UART, there will be no RI signal.
	"physical"	The RI signal is output to the RI pin of the main UART.
<err>	Error codes. For more details, please refer to ***Chapter 14.5***.	

4.4.13. AT+QCFG="cmux/urcport" Set CMUX Port to Output URC

This command sets CUMX port to output URC.

AT+QCFG="cmux/urcport" Set CMUX Port to Output URC	
Write Command **AT+QCFG="cmux/urcport"[,<URC_port>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "cmux/urcport",<URC_port>** **OK** If the optional parameter is specified, set CMUX port to output URC: **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

<URC_port>	Integer type. CMUX port to output URC.	
	0	Output URC to all CMUX ports
	1	Output URC to all CMUX 1
	2	Output URC to all CMUX 2
	3	Output URC to all CMUX 3
	4	Output URC to all CMUX 4
<err>	Error codes. For more details, please refer to *Chapter 14.5*.	

4.4.14. AT+QCFG="tone/incoming"　Configure Incoming Call Ringtone

This command configures the ringtone for incoming calls.

AT+QCFG="tone/incoming"　Configure Incoming Call Ringtone	
Write Command **AT+QCFG="tone/incoming"[,<enable>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "tone/incoming",<enable>** **OK** If the optional parameter is specified, configure the ringtone for incoming calls: **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. Incoming call ringtone configuration.	
	0	Turn off the ringtone
	2	Turn on the ringtone, with the type of tone.
	3	Turn on the ringtone, with the type of customized ringtone. You need to rename the ringtone to *CustRingTone.wav* and upload it to the UFS directory of the module's file system.

<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.15. AT+QCFG="ledmode"   Configure Output Mode of Network Light

This command configures the output mode of the network light.

AT+QCFG="ledmode" Configure Output Mode of Network Light	
Write Command **AT+QCFG="ledmode"[,<enable>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "ledmode",<enable>** **OK** If the optional parameter is specified, configure the output mode of the network light: **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. The output mode of the network light (modem/minipcie).
	<u>0</u> modem mode.
	1 minipci mode. When the module searched the nework, NET_MODE pin outputs high level, otherwise, it outputs low.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.16. AT+QCFG="fota/cid"   Configure PDP Context ID in FOTA Download

This command configures PDP context ID in FOTA download.

AT+QCFG="fota/cid" Configure PDP Context ID in FOTA Download	
Write Command **AT+QCFG="fota/cid"[,<contextID>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "fota/cid",<contextID>** **OK** If the optional parameter is specified, configure PDP context ID in FOTA download: **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

<contextID>	Integer type. Context ID. Range: 1–7. Default value: 1.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.17. AT+QCFG="fota/times"   Configure Connection Expiration Time in HTTP

FOTA Download

This command configures the connection expiration time in HTTP FOTA download.

AT+QCFG="fota/times" Configure Connection Expiration Time in HTTP FOTA Download	
Write Command **AT+QCFG="fota/times"[,<timeout>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "fota/times",<timeout>** **OK**

	If the optional parameter is specified, configure the connection expiration time in HTTP FOTA download: **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

<timeout>	Integer type. The connection expiration time in HTTP FOTA download. Range: 0–120. Default value: 60. Unit: seconds.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

4.4.18. AT+QCFG="fota/path"   Configure FOTA Firmware Package Storage Space

This command configures the storage space to save the FOTA firmware package.

AT+QCFG="fota/path" Configure FOTA Firmware Package Storage Space	
Write Command **AT+QCFG="fota/path"[,<dst>]**	Response If the optional parameter is omitted, query the current configuration: **+QCFG: "fota/path",<dst>** **OK** If the optional parameter is specified, configure the storage space to save the FOTA firmware package: **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

<dst>	String type. The storage types. For details about the supported storage types of different modules, see ***document [1]***.
	<u>"UFS:"</u> UFS. Sub-directories are supported.
	"EFS:" external Flash. Sub-directories are supported.
	"SD:" SD card. Only root directory is supported.
<err>	Error codes. For more details, please refer to ***Chapter 14.5***.

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 that is attached to MT.

AT+CIMI Request International Mobile Subscriber Identity (IMSI)	
Test Command **AT+CIMI=?**	Response **OK**
Execution Command **AT+CIMI**	Response TA returns **<IMSI>** for identifying the individual (U)SIM which is attached to ME. **<IMSI>** **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristic	/
Reference 3GPP TS 27.007	

Parameter

<IMSI>	International Mobile Subscriber Identity (string without double quotes).
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

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. For Write Command, **<passwd>** 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>**.

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**
Maximum Response Time	5 s
Characteristic	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<fac>	String type.
	"SC" (U)SIM (lock (U)SIM/UICC card installed in the currently selected card slot) ((U)SIM/UICC asks password in MT power-up and when this lock command issued).
	"AO" BAOC (Bar All Outgoing Calls) (refer to *3GPP TS 22.088 clause 1*).
	"OI" BOIC (Bar Outgoing International Calls) (refer to *3GPP TS 22.088 clause 1*).
	"OX" BOIC-exHC (Bar Outgoing International Calls except to Home Country) (refer to *3GPP TS 22.088 clause 1*).
	"FD" (U)SIM card or active application in the UICC (GSM or (U)SIM) fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as **<passwd>**).

\<mode\>	Integer type. The status of network service.	
	0	Unlock
	1	Lock
	2	Query status
\<passwd\>	String type. Password.	
\<class\>	Integer type.	
	1	Voice
	2	Data
	4	FAX
	<u>7</u>	All telephony except SMS
	8	Short message service
	16	Data circuit synchronization
	32	Data circuit asynchronization
\<status\>	Integer type.	
	0	Off
	1	On

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 the module requires a password which is necessary or not before it can be operated. The password may be (U)SIM PIN, (U)SIM PUK, etc.

Read Command returns an alphanumeric string indicating whether some password is required or not.
TA stores a password, such as (U)SIM PIN, (U)SIM PUK, etc., which is necessary before it can be operated. 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 is required. This second pin **<new_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 **+CPIN: <code>** **OK**
Write Command **AT+CPIN=<pin>[,<new_pin>]**	Response **OK**
Maximum Response Time	5 s
Characteristic	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<code>	String without double quotes. The password that the module requires.
	READY MT is not pending for any password
	SIM PIN MT is waiting for SIM PIN to be given
	SIM PUK MT is waiting for SIM PUK to be given
	SIM PIN2 MT is waiting for SIM PIN2 to be given
	SIM PUK2 MT is waiting for SIM PUK2 to be given
<pin>	String type. Password. If the requested password was a PUK, such as (U)SIM PUK1, or another password, then **<pin>** must be followed by **<new_pin>**.
<new_pin>	String type. New password required if the requested code was a PUK.

Example

```
//Enter PIN
AT+CPIN?
+CPIN: SIM PIN                          //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                        //Waiting (U)SIM PIN to be given.

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: ("SC",8),("P2",8)** **OK**
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response **OK**
Maximum Response Time	5 s
Characteristic	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<fac>	String type. The facility lock.
	"SC"　(U)SIM (lock (U)SIM/UICC card) ((U)SIM/UICC asks password in MT power-up and when this lock command is issued)
	"P2"　(U)SIM PIN2
<pwdlength>	Integer type. Maximum length of the password.
<oldpwd>	String type. Password specified for the facility from the user interface or with command.
<newpwd>	String type. New password.

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?                            //Waiting (U)SIM PIN to be given.
+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.

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
Characteristic	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.007	

Parameter

<length>	Integer type. Length of **<command>** or **<response>** string.
<command>	Command transferred 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. For more details, please refer to *Chapter 14.5*.

5.6.   AT+CRSM   Restricted (U)SIM Access

This command offers easy and 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
Characteristic	The command takes effect immediately. The configuration will be saved automatically.
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; refer to **AT+CSCS**).
\<pathId\>	The directory path of an elementary file on a (U)SIM/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; refer to **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 (refer to *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. For more details, please refer to *Chapter 14.5*.

Example

```
AT+CRSM=214,28539,0,0,12,"FFFFFFFFFFFFFFFFFFFFFFFF"
+CRSM: 144,0,""

OK
```

5.7. AT+QCCID Show ICCID

This command returns the ICCID (Integrated Circuit Card Identifier) number of (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>	String without double quotes. 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+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). Default value: 7.
	0 Initial state
	1 CPIN READY. Operation like lock/unlock PIN is allowed.
	2 SMS DONE. SMS initialization completed.
	4 PB DONE. Phonebook initialization completed.

5.9. 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 (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
Characteristic	The command takes effect immediately. The configurations 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 that of in 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   //(U)SIM card is ready.

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

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

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 immediately.

	The configurations 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.
	<u>0</u> 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 the initialization of (U)SIM card

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
```

5.11. AT+CCHO   Open Logical Channel

This command opens a logical channel of (U)SIM card.

AT+CCHO Open Logical Channel	
Test Command **AT+CCHO=?**	Response **OK**
Write Command **AT+CCHO=<dfname>**	Response **<sessionID>** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<dfname>	String type. All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes.
<sessionID>	Integer type. A session ID to be used to target a specific application on the smart card using logical channels mechanism.

NOTE

The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the **<sessionID>** indicated in the AT command. See *3GPP TS 31.101* for further information on logical channels in APDU commands protocol.

Example

```
AT+CCHO=?                                        //Test command.
OK
AT+CCHO="A0000000871002FF86FFFF89FFFFFFFF" //<dfname> is made up of AID strings.
+CCHO: 1                                         //The session ID is 1.

OK
```

5.12. AT+CGLA   UICC Logical Channel Access

This command accesses a UICC logical channel.

AT+CGLA UICC Logical Channel Access	
Test Command **AT+CGLA=?**	Response **OK**
Write Command **AT+CGLA=<sessionID>,<length>,<command>**	Response **+CGLA: <length>,<response>** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<sessionID>	Integer type. This is the identifier of the session to be used to send the APDU commands to the UICC. It is mandatory to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").
<length>	Integer type. Length of the characters that are sent to TE in **<command>** or **<response>** (Twice the actual length of the command or response).
<command>	Command passed on by the MT to the UICC in the format as described in *3GPP TS 31.101* (hexadecimal character format; refer to **AT+CSCS**).
<response>	Response to the command passed on by the UICC to the MT in the format as described in *3GPP TS 31.101*(hexadecimal character format; refer to **AT+CSCS**).

Example

```
AT+CGLA=?                        //Test command.
OK
AT+CGLA=1,14,"00A40804022F00"    //The command is 00A40804022F00.
+CGLA: 4,"6121"                  //The length is 4, the response is 6121.


OK
```

5.13. AT+CCHC   Close Logical Channel

This command closes a logical channel of (U)SIM card with the given **<sessionID>**.

AT+CCHC Close Logical Channel	
Test Command **AT+CCHC=?**	Response **OK**
Write Command **AT+CCHC=<sessionID>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<sessionID>	Integer type. A session ID to be used to target a specific application on the smart card using logical channels mechanism.

Example

AT+CCHC=?	//Test command.
OK	
AT+CCHC=1	//Close logical channel: 1.
OK	

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 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.

This Write Command forces an attempt to select and register the GSM/LTE 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?**).

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 **AT+COPS=<mode>[,<format>[,<oper**	Response **OK**

>[,<AcT>]]]	
	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>	Operator in format as per **<format>**. **<mode>** determines whether **<oper>** is present or not.
<mode>	Integer type.
	0 Automatic mode. **<oper>** field is omitted
	1 Manual operator selection. **<oper>** shall be presented and **<AcT>** is optional
	2 Manually deregister from network
	3 Set only **<format>** (for **AT+COPS?**), and do not attempt registration/deregistration (**<oper>** and **<AcT>** 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. Indicate the format of **<oper>**.
	0 Long format alphanumeric **<oper>** which can be up to 16 characters
	1 Short format alphanumeric **<oper>**
	2 Numeric **<oper>**
<AcT>	Integer type. Access technology selected.
	0 GSM
	7 E-UTRAN
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

AT+COPS=?	//List all current network operators.

+COPS: (1,"CHN-UNICOM","UNICOM","46001",2),(1,"CHN-UNICOM","UNICOM","46001",0),(2,"CHN-UNICOM","UNICOM","46001",7),(1,"46011","46011","46011",7),(3,"CHINA MOBILE","CMCC","46000",0),,(0-4),(0-2)

OK

AT+COPS?	//Query the currently selected network operator.

+COPS: 0,0,"CHN-UNICOM",7

OK

6.2.   AT+CREG   CS Domain Network Registration Status

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

This Write Command 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: (**list 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 configurations can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

\<n\>	Integer type. Whether to enable related registration network URC.
	<u>0</u> Disable network registration URC
	1 Enable network registration URC **+CREG: \<stat\>**
	2 Enable network registration URC with location information:
	+CREG: \<stat\>[,\<lac\>,\<ci\>[,\<AcT\>]]
\<stat\>	Integer type. Registration network status.
	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 (LTE) cell ID in hexadecimal format.
\<AcT\>	Integer type. Access technology selected.
	0 GSM
	7 E-UTRAN
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

```
AT+CREG=1
OK

+CREG: 1                          //URC reports that ME has registered on network.
AT+CREG=2                         //Enable network registration URC with location information.
OK

+CREG: 1,"D509","80D413D",7       //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 Test Command returns values supported by the TA.

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

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

Parameter

<rssi>	Integer type. Received signal strength indication.	
	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

Example

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

OK
AT+CSQ
+CSQ: 28,99            //The current signal strength indication is 28 and the channel bit error rate is not
                         known or not detectable.

OK
```

After using network related commands such as **AT+CCWA** and **AT+CCFC**, it is recommended to wait for 3 seconds before entering **AT+CSQ** 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),(list of supported **<format>**s) **OK**
Read Command **AT+CPOL?**	Response Query the list of preferred operators: **+CPOL: <index>,<format>,<oper>[,<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>]** **[+CPOL: <index>,<format>,<oper>[,<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>** **…]** **OK**
Write Command **AT+CPOL=<index>[,<format>[,<oper>[<GSM>,<GSM_compact>,<UTRAN>,<E-UTRAN>]]]**	Response Edit the list of preferred operators: **OK** Or **ERROR** If the **<index>** is given but the **<oper>** is left out, the entry is deleted.
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately.
Reference 3GPP TS 27.007	

Parameter

\<index\>	Integer type. The order number of the 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. Operator. **\<format\>** indicates the format is alphanumeric or numeric (see **AT+COPS**).
\<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

NOTE

The access technology selection parameters **\<GSM\>**, **\<GSM_compact\>**, **\<UTRAN\>** and **\<E-UTRAN\>** are required for (U)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 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. For more details, please refer to *Chapter 14.5*.

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: (**range of supported **<enable>**s**)** **OK**
Write Command **AT+CTZU=<enable>**	Response **OK** Or **ERROR**
Read Command **AT+CTZU?**	Response **+CTZU: <enable>** **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

<enable>	Integer type. The mode of automatic time zone update.
	<u>0</u> Disable automatic time zone update via NITZ
	1 Enable automatic time zone update via NITZ
	3 Enable automatic time zone update via NITZ and update LOCAL time to RTC

Example

```
AT+CTZU?
+CTZU: 0

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

OK
AT+CTZU=1
OK
AT+CTZU?
+CTZU: 1

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.

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**
Read Command **AT+CTZR?**	Response **+CTZR: <reporting>** **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

<reporting>	Integer type. The mode of time zone reporting.
	<u>0</u> Disable time zone reporting of changed event
	1 Enable time zone reporting of changed event by URC **+CTZV: <tz>**
	2 Enable extended time zone reporting by URC **+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.

Example

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

OK

+CTZE: "+32",0,"2017/11/04,06:51:13"          //Time zone and local time reported by URC.
```

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

This command obtains the latest time synchronized through network.

This Execution Command returns the latest time that has been 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 error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<mode>	Integer type. The mode of querying 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 value. Format is "YYYY/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>	Integer type. Includes daylight savings adjustment or not.
	  0 Includes no adjustment for daylight saving time
	  1 Includes +1 hour adjustment for daylight saving time

	2 Includes +2 hours adjustment for daylight saving time
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

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

Example

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

OK
AT+QLTS                //Query the latest time synchronized through network.
+QLTS: "2017/10/13,03:40:48+32,0"

OK
AT+QLTS=0              //Query the latest time synchronized through network. It offers the same
                         function as Execution Command AT+QLTS.
+QLTS: "2017/10/13,03:40:48+32,0"

OK
AT+QLTS=1              //Query the current GMT time calculated from the latest time that has been
                         synchronized through network
+QLTS: "2017/10/13,03:41:22+32,0"

OK
AT+QLTS=2              //Query the current LOCAL time calculated from the latest time that has been
                         synchronized through network
+QLTS: "2017/01/13,11:41:23+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. "No Service" "GSM" "GPRS" "TDD LTE" "FDD LTE"
<oper>	String type. The operator in numeric format.
<band>	String type. The selected band. "GSM 850" "GSM 900" "GSM 1800" "GSM 1900" "LTE BAND 1" "LTE BAND 2" "LTE BAND 3" "LTE BAND 4" "LTE BAND 5" "LTE BAND 7" "LTE BAND 8" "LTE BAND 20" "LTE BAND 28" "LTE BAND 34" "LTE BAND 38" "LTE BAND 39"

	"LTE BAND 40"
	"LTE BAND 41"
	"LTE BAND 66"
\<channel\>	Integer type. Channel ID.

Example

```
AT+QNWINFO=?
OK
AT+QNWINFO
+QNWINFO: "FDD LTE","46011","LTE BAND 3",1650

OK
```

6.10. AT+QSPN Query Service Provider Name

AT+QSPN Query Service Provider Name	
Test Command **AT+QSPN=?**	Response **OK**
Execution Command **AT+QSPN**	Response **+QSPN: \<FNN\>,\<SNN\>,\<SPN\>,\<alphabet\>,\<RPLMN\>** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

\<FNN\>	String type. Full network name.
\<SNN\>	String type. Short network name.
\<SPN\>	String type. Service provider name.
\<alphabet\>	Integer type. Alphabet of full network name and short network name.
	0 GSM 7-bit default alphabet
	1 UCS2
\<RPLMN\>	String type. Registered PLMN.

NOTE

1. If **\<alphabet\>** is 0, **\<FNN\>** and **\<SNN\>** will be shown in GSM 7-bit default alphabet string.
2. If **\<alphabet\>** is 1, **\<FNN\>** and **\<SNN\>** will be shown in UCS2 hexadecimal string.

Example

AT+QSPN //Query the EONS information of registered PLMN. **+QSPN: "CHN-UNICOM","UNICOM","",0,"46001"** **OK**

6.11. AT+QCSQ   Query and Report Signal Strength

This command queries and reports the signal strength of the current service network. If the MT is registered with multiple networks in different service modes, you can query the signal strength of networks in each mode. No matter whether the MT is registered a network or not, you can execute **AT+QCSQ=1** to query the signal strength or allow the MT to report the detected signal strength via URC if the MT camps on the network. If the MT doesn't use any service network or the service mode is uncertain, "NOSERVICE" will be returned.

AT+QCSQ Query and Report Signal Strength	
Test Command **AT+QCSQ=?**	Response **+QCSQ: (**list of supported **<sysmode>**s**)** **OK**
Write Command **AT+QCSQ=<enable>**	Response **OK**
Read Command **AT+QCSQ?**	Response **+QCSQ: <enable>** **OK**
Execution Command **AT+QCSQ**	Response **+QCSQ: <sysmode>,[,<value1>[,<value2>[,<value3>[,<value4>]]]]** **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

\<sysmode\>	A string type value indicating the service mode in which the MT will report the signal strength via URC.
	"NOSERVICE" NOSERVICE mode
	"GSM" GSM/GPRS mode
	"LTE" LTE mode
\<value\>	The signal strength corresponding to each service mode. See *Table 4* for details.
\<gsm_rssi\>	Integer type. Received signal strength indication for GSM mode. Unit: dBm.
\<lte_rssi\>	Integer type. Received signal strength indication for LTE mode. Unit: dBm.
\<lte_rsrp\>	Integer type. Reference signal received power for LTE mode. Unit: dBm.
\<lte_sinr\>	Integer type. Signal to interference plus noise ratio for LTE mode. The conversion formula for actual SINR is: $Y = X/2 - 23.5$.
	X **\<lte_sinr\>** value queried by **AT+QCSQ**
	Y Actual value of SINR after calculating with the formula. Range: -23 to 40. Unit: dB.
\<lte_rsrq\>	Integer type. Reference signal received quality for LTE mode. Unit: dB.
\<enable\>	Integer type. Whether to report URC.
	<u>0</u> Disable
	1 Enable

Table 4: Signal Strength Type

\<sysmode\>	\<value1\>	\<value2\>	\<value3\>	\<value4\>
"NOSERVICE"	-	-	-	-
"GSM"	**\<gsm_rssi\>**	-	-	-
"LTE"	**\<lte_rssi\>**	**\<lte_rsrp\>**	**\<lte_sinr\>**	**\<lte_rsrq\>**

NOTE

URC is shown as below:

+QCSQ: \<sysmode\>[,\<value1\>[,\<value2\>[,\<value3\>[,\<value4\>]]]]

The URC allows the MT to unsolicitedly report the current signal strength when the strength changes.

The Write Command is used to control URC indication, Default is off (**\<enable\>**=0). If **\<enable\>**=1, then the MT can unsolicitedly report the current signal strength when the strength changes.

Example

AT+QCSQ	//Query signal strength.
+QCSQ: "LTE",-52,-81,195,-10	
OK	
AT+QCSQ?	//Query URC configuration.
+QCSQ: 0	
OK	
AT+QCSQ =?	//List of supported **<sysmode>**.
+QCSQ: "NOSERVICE","GSM","LTE"	
OK	

6.12. AT+CIND Query Indicator State

AT+CIND Query Indicator State	
Test Command **AT+CIND=?**	Response **+CIND: (<descr>,(list of supported <ind>s))[,(<descr>,(list of supported <ind>s))[,...]]** **OK**
Read Command **AT+CIND?**	Response **+CIND: <ind>[,<ind>[,...]]** **OK** If error is related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<descr>	String type. Indicator state, see the following notes for details.
<ind>	Integer type. Indicator event, related to the value of the **<descr>**, see the following notes for details.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

The values of **<descr>** and **<ind>** are described as follows:

<descr>	<ind>
"battchg"	Battery charge level. Range: 0–5.
"signal"	Signal strength indication. 0–5: According to the signal strength, it is divided into five levels from weak to strong.
"service"	Network service status indicator. 0 Not registered on the network 1 Registered to the known network
"sounder"	Sounder activity. The value is not supported currently.
"message"	Message received. 0 Not received 1 Received
"call"	Call status indication. 0 No call 1 call
"roam"	Roaming indicator. 0 Registered with the ownership or unregistered network 1 Registered to the roaming network
"smsfull"	A short message memory storage in the MT has become full (0), or memory locations are available (1).

Example

AT+CIND=?
+CIND: ("battchg",(0-5)),("signal",(0-5)),("service",(0,1)),("sounder",(0,1)),("message",(0,1)),("call",(0,1)),("roam",(0,1)),("smsfull",(0,1))

OK
AT+CIND?
+CIND: 0,3,1,0,0,0,1,0

OK

7 Call Related Commands

7.1. ATA Answer an Incoming Call

This command connects the module to an incoming voice or data call indicated by a **RING** URC.

ATA Answer an Incoming Call	
Execution Command **ATA**	Response Response in case of voice call, if successfully connected: **OK** Response if no connection: **NO CARRIER**
Maximum Response Time	90 s, determined by network.
Characteristics	/
Reference V.25ter	

NOTE

1. Any additional commands on the same command line are ignored.
2. This command may be aborted generally by receiving a character during execution. The aborting is not possible during some states of connection establishment such as handshaking.

Example

```
RING                            //A voice call is ringing.
AT+CLCC
+CLCC: 1,0,0,1,0,"",128         //PS call in LTE mode.
+CLCC: 2,1,4,0,0,"02154450290",129    //Incoming call.

OK
ATA                             //Accept the voice call with ATA.
OK
```

7.2. ATD Mobile Originated Call to Dial a Number

This command sets up outgoing voice and data calls. Supplementary services can also be controlled with this command.

ATD Mobile Originated Call to Dial a Number	
Execution Command **ATD\<n\>[\<mgsm\>][;]**	Response If a connection cannot be established: **NO CARRIER** If connection is successful and voice call: **OK**
Maximum Response Time	5 s, determined by network (**AT+COLP=0**).
Characteristics	/
Reference V.25ter	

Parameter

\<n\>	String of dialing digits and optionally V.25ter modifiers. Dialing digits: 0-9, * , #, +, A, B, C Following V.25ter modifiers are ignored: ,(comma), T, P, !, W, @
\<mgsm\>	String of **GSM** modifiers:
	I Actives **CLIR** (Disable presentation of own number to called party)
	i Deactivates **CLIR** (Enable presentation of own number to called party)
	G Activates closed user group invocation for this call only
	g Deactivates closed user group invocation for this call only
\<;\>	Only required to set up voice call, return to command mode

> **NOTE**

1. When being executed, this command may be aborted generally by the module's receiving of an **ATH** or a character. However, the command will not be aborted during some connection establishments such as handshaking.
2. Parameter "**I**" and "**i**" are only valid when no "*****" or "**#**" code is within the dial string.
3. Responses returned after dialing with **ATD**:
   For voice call, two different response modes can be determined. TA returns **OK** immediately either after dialing was completed or after the call was established. The setting is controlled by **AT+COLP**, of which default is **AT+COLP=0** which causes the TA to return **OK** immediately after the dialing was completed. Otherwise, TA returns **OK**, **BUSY**, **NO DIAL TONE**, or **NO CARRIER**.
4. Using **ATD** during an active voice call:

- When a user originates a second voice call while there is already an active voice call, the first call will be automatically put on hold.
- The current states of all calls can be easily checked at any time with **AT+CLCC**.

Example

ATD10086;	//Dialing out.
OK	

7.3. ATH Disconnect Existing Connection

This command disconnects circuit switched data calls or voice calls. **AT+CHUP** is also used to disconnect the voice call.

ATH Disconnect Existing Connection	
Execution Command **ATH[n]**	Response Disconnect existing call by local TE from command line and terminate the call. **OK**
Maximum Response Time	90 s, determined by network.
Characteristics	/
Reference V.25ter	

Parameter

<n>	Integer type.
	0 Disconnect existing call from command line and terminate the call

7.4. AT+CVHU Voice Hang up Control

This command controls whether **ATH** can be used to disconnect the voice call.

AT+CVHU Voice Hang up Control	
Test Command **AT+CVHU=?**	Response **+CVHU: (**list of supported **<mode>**s) **OK**
Read Command **AT+CVHU?**	Response **+CVHU: <mode>**

	OK
Write Command **AT+CVHU=\<mode\>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

\<mode\>	Integer type. 0 **ATH** can be used to disconnect the voice call. 1 **ATH** is ignored but **OK** response is returned.

7.5. AT+CHUP Hang up Voice Call

This command cancels all voice calls in the state of Active, Waiting and Held. For data connections, use
ATH.

AT+CHUP Hang up Voice Call	
Test Command **AT+CHUP=?**	Response **OK**
Execution Command **AT+CHUP**	Response **OK** Or **ERROR**
Maximum Response Time	90 s, determined by network.
Characteristics	/
Reference 3GPP 27.007	

Example

```
RING                                    //Incoming call.


AT+CHUP                                 //Hang up the call.
OK
```

7.6. +++ Switch from Data Mode to Command Mode

This command is only available when TA is in data mode. The "**+++**" character sequence causes the TA to cancel the data flow over the AT interface and switch to command mode. This allows entering AT command while maintaining the data connection with the remote server or, accordingly, the GPRS connection.

+++ Switch from Data Mode to Command Mode	
Execution Command **+++**	Response **OK**
Maximum Response Time	300 ms
Characteristics	/
Reference V.25ter	

NOTE

1. To prevent the **+++** escape sequence from being misinterpreted as data, the following sequence should be followed:
   1) Do not input any character within 1s before inputting **+++**.
   2) Input **+++** within 1s, and no other characters can be inputted during the time.
   3) Do not input any character within 1s after **+++** has been inputted.
   4) Switch to command mode successfully; otherwise return to Step 1.
2. To return back to data mode from command mode, please enter **ATO**.
3. Another way to change to command mode is through DTR level change, and please refer to **AT&D** command for details.

7.7. ATO Switch from Command Mode to Data Mode

This command resumes the connection and switches back from command mode to data mode.

ATO Switch from Command Mode to Data Mode	
Execution Command **ATO[n]**	Response If connection is not successfully resumed: **NO CARRIER** If connection is successfully resumed, TA returns to data mode from command mode: **CONNECT <text>**
Maximum Response Time	300 ms

Characteristics	/
Reference V.25ter	

Parameter

\<n\>	Integer type.	
	0	Switch from command mode to data mode

> **NOTE**
>
> When TA returns to data mode from command mode successfully, **CONNECT \<text\>** is returned. Please note that **CONNECT \<text\>** outputs only when **\<value\>** is greater than 0 in **ATX\<value\>** parameter setting.

7.8. ATS0 Set Number of Rings before Automatic Answering

This command controls automatic answering mode for the incoming calls.

ATS0 Set Number of Rings before Automatic 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. 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.

7.9. ATS7 Set Time to Wait for Connection Completion

This command specifies the amount of 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 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.
    <u>0</u>   Disabled
    1–255   Number of seconds to wait for connection completion. Unit: second.

7.10. AT+CSTA Select Type of Address

This Write Command selects the type of number for further dialing commands **ATD** according to 3GPP Specifications. Test command returns values supported a compound value.

AT+CSTA Select Type of Address	
Test Command **AT+CSTA=?**	Response **+CSTA: (**list of supported **<type>**s**)** **OK**
Read Command **AT+CSTA?**	Response **+CSTA: <type>** **OK**
Write Command **AT+CSTA=<type>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<type>	Integer type. Current address type.	
	<u>129</u>	Unknown type
	145	International type (contains the character "+")
	161	National type

7.11. AT+CLCC List Current Calls of ME

This Execution Command returns the list of all current calls. If the command is executed successfully, but no calls existed, no information response but **OK** is sent to TE.

AT+CLCC List Current Calls of ME	
Test Command **AT+CLCC=?**	Response **OK**
Execution Command **AT+CLCC**	Response **[+CLCC : <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>, <type>[,<alpha>]]**

	[+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>, <type>[,<alpha>]] [...] OK If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<idx>	Integer type. Call identification number as described in *3GPP TS 22.030 subclause 4.5.5.1*. It can be used in **AT+CHLD**.
<dir>	Integer type.
	0 Mobile originated (MO) call
	1 Mobile terminated (MT) call
<stat>	Integer type. State of the call.
	0 Active
	1 Held
	2 Dialing (MO call)
	3 Alerting (MO call)
	4 Incoming (MT call)
	5 Waiting (MT call)
<mode>	Integer type. Bearer service/teleservice.
	0 Voice
	1 Data
	2 FAX
<mpty>	Integer type.
	0 Call is not one of multiparty (conference) call parties
	1 Call is one of multiparty (conference) call parties
<number>	Phone number in string type in format specified by **<type>**.
<type>	Type of address of octet in integer format (refer to *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
<alpha>	Alphanumeric representation of **<number>** corresponding to the entry found in phonebook.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

ATD10086;	//Establish a call.
OK	
AT+CLCC	
+CLCC: 1,0,0,0,0,"10086",129	//Establish a call, and the call has been answered.
OK	

7.12. AT+CRC   Set Cellular Result Codes for Incoming Call Indication

This command controls whether or not to use the extended format of incoming call indication. When it is enabled, an incoming call is indicated to the TE with unsolicited result code **+CRING: <type>** instead of the normal **RING**.

AT+CRC Set Cellular Result Codes for Incoming Call Indication	
Test Command **AT+CRC=?**	Response **+CRC: (**list of supported **<mode>**s**)** **OK**
Read Command **AT+CRC?**	Response **+CRC: <mode>** **OK**
Write Command **AT+CRC=[<mode>]**	Response **OK**
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	Disable extended format
	1	Enable extended format
<type>	String type.	
	ASYNC	Asynchronous transparent
	SYNC	Synchronous transparent
	REL ASYNC	Asynchronous non-transparent
	REL SYNC	Synchronous non-transparent
	FAX	Facsimile
	VOICE	Voice

Example

```
AT+CRC=1                          //Enable extended format.
OK


+CRING: VOICE                     //Indicate incoming call to the TE.
ATH
OK
AT+CRC=0                          //Disable extended format.
OK


RING                              //Indicate incoming call to the TE.
ATH
OK
```

7.13. AT+QECCNUM   Configure Emergency Call Numbers

This command queries, adds and deletes ECC (Emergency Call Codes) numbers. There are two kinds of ECC numbers: ECC numbers without (U)SIM card and ECC numbers with (U)SIM card. The default ECC numbers without (U)SIM card is 911, 112, 00, 08, 110, 999, 118 and 119. The default ECC number with (U)SIM card is 911 and 112. 911 and 112 will always be supported as ECC numbers, and cannot be deleted. ECC numbers can be saved into NV automatically. If the (U)SIM card contains ECC file, the numbers in ECC file can also be regarded as ECC numbers.

The supported ECC numbers of each type is 20 at most.

AT+QECCNUM	Configure Emergency Call Numbers
Test Command **AT+QECCNUM=?**	Response **+QECCNUM: (**range of supported **<mode>**s**)** **OK**
Write Command **AT+QECCNUM=<mode>,<type>[,<ecc num1>[,<eccnum2>,…[,<eccnumN>]]]**	Response If **<mode>** is equal to 0, **<type>** is specified, query the ECC numbers. In this case, **<eccnumN>** should be omitted: **+QECCNUM: <type>,<eccnum1>,<eccnum2>[,…]** **OK** If **<mode>** is not equal to 0: **<mode>**=1 is used to add the ECC number; **<mode>**=2 is used to delete the ECC number. In this case, at least one ECC number **<eccnumN>** should be inputted, and the response is: **OK** Or **ERROR**
Read Command **AT+QECCNUM?**	Response **+QECCNUM: 0,<eccnum1>,<eccnum2>[,…]** **+QECCNUM: 1,<eccnum1>,<eccnum2>[,…]** **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically.

Parameter

<mode>	Integer type. ECC number operations.
	0 Query ECC numbers
	1 Add ECC numbers
	2 Delete ECC numbers
<type>	Integer type. ECC number type.
	0 ECC numbers without (U)SIM card
	1 ECC numbers with (U)SIM card
<eccnum>	String type. ECC numbers (e.g."110", "119").

Example

```
AT+QECCNUM=?                      //Query the supported ECC number operation mode.
+QECCNUM: (0-2)

OK
AT+QECCNUM?                       //Query the ECC numbers with or without (U)SIM card.
+QECCNUM: 0,"911","112","00","08","110","999","118","119"
+QECCNUM: 1,"911","112"

OK
AT+QECCNUM=0,1                    //Query the ECC numbers with (U)SIM card.
+QECCNUM: 1,"911","112"

OK
AT+QECCNUM=1,1,"110","234"   //Add "110" and "234" into the type of ECC numbers with (U)SIM card.
OK
AT+QECCNUM=0,1                    //Query the ECC numbers with (U)SIM card.
+QECCNUM: 1, "911","112","110","234"

OK
AT+QECCNUM=2,1,"110"             //Delete "110" from the type of ECC numbers with (U)SIM card.
OK
AT+QECCNUM=0,1                    //Query the ECC numbers with (U)SIM card.
+QECCNUM: 1, "911","112","234"

OK
```

7.14. AT+QHUP   Hang up Call with a Specific Release Cause

This command can terminate a call or calls (including both voice call and data call) with a specific *3GPP TS 24.008* release cause specified by the host.

AT+QHUP Hang up Call with a Specific Release Cause	
Test Command **AT+QHUP=?**	Response **OK**
Write Command **AT+QHUP=<cause>[,<idx>]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**

Maximum Response Time	90 s, determined by network.
Characteristics	/

Parameter

<cause>	Integer type. Release cause. *3GPP TS 24.008* release cause to be indicated to the network.

	1	Release cause "unassigned (unallocated) number"
	16	Release cause "normal call clearing"
	17	Release cause "user busy"
	18	Release cause "no user responding"
	21	Release cause "call rejected"
	27	Release cause "destination out of order"
	31	Release cause "normal, unspecified"
	88	Release cause "incompatible destination"

<idx>	Integer type. Call identification number is an optional index in the list of current calls indicated by **AT+CLCC**. **AT+QHUP** will terminate the call identified by the given call number. The default call number 0 is not assigned to any call, but signifies all calls.

	<u>0</u>	Terminate all existing calls. However, if circuit switches data calls and voice calls at the same time, this command only terminates the CSD calls.
	1…7	Terminate the specific call with identification number.

<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

```
AT+QHUP=?            //Test Command.
OK
ATD10010;            //Dial 10010.
OK
AT+CLCC              //Query the status of calls.
+CLCC: 1,0,0,0,0,"10010",129

OK
AT+QHUP=17,1         //Terminate the call whose ID is 1. Release cause is "user busy".
OK
ATD10010;            //Dial 10010.
OK
AT+CLCC              //Query the status of calls.
+CLCC: 1,0,0,0,0,"10010",129

OK
AT+QHUP=16           //Terminate all existing calls. Release cause is "normal call clearing".
```

OK
AT+CLCC
OK

7.15. AT+QCHLDIPMPTY Hang Up a Call in the VoLTE Conference

This command hangs up a call in the VoLTE conference.

AT+QCHLDIPMPTY Hang Up a Call in the VoLTE Conference	
Test Command **AT+QCHLDIPMPTY=?**	Response **+QCHLDIPMPTY: \<number\>** **OK**
Write Command **AT+QCHLDIPMPTY=\<number\>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	/

Parameter

\<number\>	String of dialing digits and optionally V.25ter modifiers. Dialing digits: 0-9, *, #, +, A, B, C Following V.25ter modifiers are ignored: ,(comma), T, P, !, W, @

Example

```
AT+QCHLDIPMPTY=?                    //Test command.
+QCHLDIPMPTY: <number>

OK
ATD13866783782;                     //Establish a call.
OK
AT+CLCC
+CLCC: 2,1,0,1,0,"",128
+CLCC: 1,0,0,0,0,"13866783782",129  //The second call is active.

OK
AT+CHLD=2                           //Place the active call on hold and accept the waiting call as
                                      the active call.
```

OK
AT+CLCC   //Query the status of calls.
+CLCC: 2,1,0,1,0,"",128
+CLCC: 1,0,1,0,0,"13866783782",129   //The second call on hold.

OK
ATD15155196746;   //Establish a call.
OK
AT+CLCC
+CLCC: 2,1,0,1,0,"",128
+CLCC: 1,0,1,0,0,"13866783782",129   //The second call on hold.
+CLCC: 3,1,0,1,0,"",128
+CLCC: 4,0,0,0,0,"15155196746",129   //The fourth call is active.

OK
AT+CHLD=3   //Add a held call to the active calls in order to set up a conference (multiparty) call.
OK
AT+CLCC
+CLCC: 2,1,0,1,0,"",128
+CLCC: 3,1,0,1,0,"",128
+CLCC: 5,0,0,0,0,"sip:mmtel",128

OK
AT+QCHLDIPMPTY="13866783782"   //Hang up a call which is activated.
OK
AT+QCHLDIPMPTY=" 15155196746"   //Hang up a call which is activated.
OK

8 Phonebook Commands

8.1. 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**.
<number>	String type phone number of format specified by **<type>**.
<type>	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
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

8.2. 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. Indicate the maximum length of field **<number>**.
<tlength>	Integer type. Indicate the maximum length of field **<text>**.
<findtext>	String type. The field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<number>	String type. The phone number of format specified by **<type>**.
<index>	Integer type. In the range of location numbers of phonebook memory.
<type>	Type of address of octet in integer format (refer *3GPP TS 24.008*). Usually, it has three kinds of values:
	129 Unknown type
	145 International type (contains the character "+")
	161 National type
<text>	String type. The field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.

<err>	Error codes. For more details, please refer to *Chapter 14.5*.

8.3. AT+CPBR Read Phonebook Entries

This command reads 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. Location numbers of phonebook memory.
<nlength>	Integer type. Indicate the maximum length of field **<number>**.
<tlength>	Integer type. Indicate the maximum length of field **<text>**.
<index1>	Integer type. The first phonebook record to read.
<index2>	Integer type. The last phonebook record to read.
<number>	String type. The phone number of format specified by **<type>**.
<type>	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

<text>	String type. The field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

8.4. 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. Phonebook memory storage.
	"<u>SM</u>" (U)SIM phonebook
	"FD" (U)SIM fix dialing-phonebook (**AT+CPBW** operation need the authority of PIN2)
	"LD" (U)SIM last-dialing-phonebook (**AT+CPBW** may not be applicable to this storage)
	"ME" Mobile equipment phonebook
	"ON" (U)SIM own numbers (MSISDNs) list
\<used\>	Integer type. Indicate the total number of used locations in selected memory.
\<total\>	Integer type. Indicate the total number of locations in selected memory.
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.

8.5. 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. Location numbers of phonebook 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 **<index>** is deleted.
<nlength>	Integer type. Indicate the maximum length of field **<number>**.
<tlength>	Integer type. Indicate the maximum length of field **<text>**.
<number>	String type. The phone number of format specified by **<type>**.
<type>	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
<text>	String type. The field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

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

9 Short Message Service Commands

9.1. 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 MT functionality: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically.
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 23.04*1 (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. For more details, please refer to *Chapter 14.6*.	

Example

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

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

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

OK
```

9.2. AT+CMGF   Message Format

This command specifies the input and output format of the short messages. **\<mode\>** indicates the format of messages used with 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** command 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	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.005	

Parameter

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

9.3.   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, 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: **+CMS ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically.
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** command 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 (see **<toda>**).
<err>	Error codes. For more details, please refer to *Chapter 14.6*.

Example

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

OK
```

9.4. 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 **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]**	Response **+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	The command takes effect immediately. The configurations will be saved automatically.
Reference 3GPP TS 27.005	

Parameter

<mem1>	String type. Messages to be read and deleted from this memory storage.
	"SM"　　　　　(U)SIM message storage
	<u>"ME"</u>　　　　　Mobile equipment message storage
	"MT"　　　　　Same as "ME" storage
<mem2>	String type. Messages will be written and sent to this memory storage.
	"SM"　　　　　(U)SIM message storage
	<u>"ME"</u>　　　　　Mobile equipment message storage
	"MT"　　　　　Same as "ME" 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
	<u>"ME"</u>　　　　Mobile equipment message storage
	"MT"　　　　Same as "ME" 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. For more details, please refer to *Chapter 14.6*.

Example

AT+CPMS?	//Query the current SMS message storage.
+CPMS: "ME",0,255,"ME",0,255,"ME",0,255	
OK	
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	

9.5. 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: (**range of supported **<index>**s**),(**range 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	The command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type. Location numbers supported by the associated memory. When **<mem1>** is set to "ME" or "MT", the range of **<index>** is 0–99. When **<mem1>** is set to "SM", the range of **<index>** shall be subject to the SMS message storage of (U)SIM card.
<delflag>	Integer type.
	<u>0</u> 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 from **<mem1>** storage, sent and unsent mobile originated messages
	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. For more details, please refer to **Chapter 14.6**.

Example

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

9.6.　AT+CMGL　List Message

The 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 messages with "REC UNREAD" status.

AT+CMGL　List Message	
Test Command **AT+CMGL=?**	Response **+CMGL: (**list of supported **<stat>**s**)** **OK**
Write Command **AT+CMGL[=<stat>]**	Response If the optional parameter is omitted (that is, execute **AT+CMGL**), list all messages with "REC UNREAD" status from message storage **<mem1>**, and then the status in the storage changes to "REC READ".

If the optional parameter is specified:
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>][,<too a/toda>,<length>]<CR><LF><data>[<CR><LF>
+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<too a/toda>,<length>]<CR><LF><data>[...]]

For SMS-STATUS-REPORTs:
+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<sct s>,<dt>,<st>[<CR><LF>
+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<sct s>,<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><C R><LF><data>[<CR><LF>
+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><C R><LF><data>[...]]

OK

If in PDU mode (**AT+CMGF=0**) and the command is executed successfully:
+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><p du><CR><LF>
+CMGL: <index>,<stat>,[alpha],<length><CR><LF><pd u>[...]]

OK

If there is any error related to ME functionality:
+CMS ERROR: <err>

Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

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. 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 *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 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 (see **<toda>** by default).
<length>	Integer type. Message length. Indicate the length of the message body **<data>** (or **<cdata>**) in characters in the text mode (**AT+CMGF=1**), or the length of the actual TP data unit in octets in PDU mode (**AT+CMGF=0**) (i.e. the RP layer SMSC address octets are not counted in the length). The maximum length in text mode is 160 bytes; the maximum length in PDU mode is 163 bytes.
<data>	In the case of SMS: *3GPP TS 23.040* TP-User-Data in text mode responses. The format is defined as follows:
	- If **<dcs>** (see *Chapter 9.7*) 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" (refer to **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 22) is presented as 16 (IRA 49 and 55)).
- If **<dcs>** (see *Chapter 9.7*) 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. The format is defined as follows:

- If **<dcs>** (see *Chapter 9.7*) 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>** (see *Chapter 9.7*) 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*.
<fo>	Depends 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 (default 2) in integer format.
<mr>	*3GPP TS 23.040* TP-Message-Reference in integer format.
<ra>	*3GPP TS 23.040* TP-Recipient-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*); type of address given by **<tora>**.
<tora>	*3GPP TS 24.011* TP-Recipient-Address Type-of-Address octet in integer format (see **<toda>** by default).
<scts>	*3GPP TS 23.040* TP-Service-Centre-Time-Stamp in time-string format (see **<dt>**).
<dt>	*3GPP TS 23.040* TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08".

<st>	*3GPP TS 23.040* TP-Status in integer format.
<ct>	*3GPP TS 23.040* TP-Command-Type in integer format (default 0).
<sn>	*3GPP TS 23.041* CBM Serial Number in integer format.
<mid>	*3GPP TS 23.041* CBM Message Identifier in integer format.
<page>	*3GPP TS 23.041* CBM Page Parameter bits 4-7 in integer format.
<pages>	*3GPP TS 23.041* CBM Page Parameter bits 0-3 in integer format.
<mem1>	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>	Integer type. For details of error codes, please refer to *Chapter 14.6*.

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	

NOTE

Operation of **<stat>** depends on the storage of listed messages.

9.7. AT+CMGR   Read Message

The 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

If there is any error related to ME functionality:
+CMS ERROR: <err>

Maximum Response Time	Depends on the length of message content.
Characteristics	The command takes effect immediately. The configurations will not be saved.
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 *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 (refer to **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 (refer to **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 (refer to **\<dt\>**).
\<fo\>	Depends 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 (default 2) in integer format.
\<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 (refer to **\<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 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to **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 refer to **<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 (refer to **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 refer to **<toda>**).
<length>	Integer type. Message length. Indicate the length of the message body **<data>** (or **<cdata>**) in characters in the text mode (**AT+CMGF=1**), or the length of the actual TP data unit in octets in PDU mode (**AT+CMGF=0**) (i.e. the RP layer SMSC address octets are not counted in the length). The maximum length in text mode is 160 bytes; the maximum length in PDU mode is 163 bytes.
<data>	The text of short message. Please refer **Chapter 14.8** for details.
<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>	*3GPP TS 23.040* TP-Command-Type in integer format (default 0).
<sn>	*3GPP TS 23.041* CBM Serial Number in integer format.
<mid>	Integer type. Message ID.
<page>	*3GPP TS 23.041* CBM Page Parameter bits 4–7 in integer format.
<pages>	*3GPP TS 23.041* CBM Page Parameter bits 0–3 in integer format.
<cdata>	*3GPP TS 23.040* TP-Command-Data in text mode responses; 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)).
<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. For more details, please refer to **Chapter 14.6**.

Example

+CMTI: "SM",3	//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",,"13/12/13,15:06:37+32",145,4,0,0,"+861380021050 0",145,27	
<This is a test from Quectel>	
OK	

9.8. AT+CMGS Send Message

This 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 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** If there is any error related to ME functionality: **+CMS 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 27.005	

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 (refer to **AT+CSCS** in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<toda>	Type of destination address. *3GPP TS 24.011* TP-Destination-Address Type-of-Address octet in integer format.
<length>	Integer type. Indicate in the text mode (**AT+CMGF=1**) the length of the message body (**<data>** or **<cdata>**, see *Chapter 9.7*) 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). The maximum length in text mode is 160 bytes; the maximum length in PDU mode is 158 bytes.
<mr>	Message reference. *3GPP TS 23.040* TP-Message-Reference in integer format.
<err>	Error codes. For more details, please refer to *Chapter 14.6*.

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. Tap **<Ctrl+Z>** to send message, or **<ESC>** to quit the sending.
+CMGS: 247	
OK	

9.9. AT+CMMS More Messages to Send

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   More Messages to Send

Test Command **AT+CMMS=?**	Response **+CMMS: (**range 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	The command takes effect immediately. The configuration will be saved automatically.
Reference 3GPP TS 27.005	

Parameter

<n>	Integer type.	
	<u>0</u>	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. For more details, please refer to *Chapter 14.6*.	

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

9.10. AT+CMGW   Write Message to Memory

This Write and Execution Commands store 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	The command takes effect immediately. The configurations will not be saved.
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 (see **<toda>** by default).

<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 destination address. *3GPP TS 24.011* TP-Destination-Address Type-of-Address octet in integer format.		
<length>	Integer type. Message length. Indicate the length of the message body **<data>** (or **<cdata>**) in characters in the text mode (**AT+CMGF=1**), or the length of the actual TP data unit in octets in PDU mode (**AT+CMGF=0**) (i.e. the RP layer SMSC address octets are not counted in the length). The maximum length in text mode is 160 bytes; the maximum length in PDU mode is 163 bytes.		
<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>	Integer type. Index of message in selected storage **<mem2>**.		
<mem2>	String type. Messages will be written and sent to this memory storage.		
	"SM"	(U)SIM message storage	
	<u>"ME"</u>	Mobile equipment message storage	
	"MT"	Same as "ME" storage	
<err>	Error codes. For more details, please refer to **Chapter 14.6**.		

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. Tap **<Ctrl+Z>** to send 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	

9.11. AT+CMSS Send Message from Storage

This Write Command sends message with location value **<index>** from message storage **<mem2>** to the network (SMS-SUBMIT). If new recipient address **<da>** is given, 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** If there is any error related to ME functionality: **+CMS 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 27.005	

Parameter

<index>	Integer type value in the range of location numbers supported by the associated memory.
<mem2>	String type. Messages will be written and sent to this memory storage. "SM"　　　(U)SIM message storage "ME"　　　Mobile equipment message storage "MT"　　　Same as "ME" storage
<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 destination address. *3GPP TS 24.011* TP-Destination-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. For more details, please refer to ***Chapter 14.6***.

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. Tap **\<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	

9.12. 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: (**range 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. For more details, please refer to *Chapter 14.6*.

NOTE

The Execution and Write Commands shall only be used when **<service>** in **AT+CSMS** equals 1 (phase 2+) and an appropriate URC has been issued by the module, i.e.:

+CMT for **<mt>**=2 incoming message Class 0,1,3 and none;

+CMT for **<mt>**=3 incoming message Class 0 and 3;

+CDS for **<ds>**=1.

Example

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

+CMT: "+8615021012496",,"13/03/18,17:07:21+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   //An error returned for the second time. It needs ACK only once.

9.13. 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: (**range of supported **<mode>**s**),(**range of supported **<mt>**s**),(**list of supported **<bm>**s**),(**range 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	The command takes effect immediately. The configurations will be saved automatically.

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.
	<u>2</u>	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.
	3	Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.
<mt>	Integer type. The rules for storing received SMS depend on its data coding scheme (refer to *3GPP TS 23.038*) and preferred memory storage (**AT+CPMS**) setting, and the value is:	
	0	No SMS-DELIVER indications are routed to the TE.
	<u>1</u>	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**). 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 CBM types selection, and the value is:	
	<u>0</u>	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.	
	<u>0</u>	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)
<bfr>	Integer type.	
	<u>0</u>	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. For more details, please refer to *Chapter 14.6*.

NOTE

Unsolicited result code:

+CMTI: <mem>,<index>	Indicates that new message has been received
+CMT: [<alpha>],<length><CR><LF><pdu>	Short message is outputted directly
+CBM: <length><CR><LF><pdu>	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",,"13/03/18,17:07:21+32",145,4,0,0,"+8613800551500",145,28
This is a test from Quectel   //Short message is outputted directly when an SMS is incoming.

9.14. 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	/
Reference 3GPP TS 27.005	

Parameter

<show>   Integer type.
        <u>0</u>   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
```

9.15. AT+CSMP   Set SMS Text Mode Parameters

This command sets values for additional parameters needed when a short message is sent to the network or placed in a storage in text mode.

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 TA selects values for additional parameters needed when SM is sent to the network or placed in a storage when text mode is selected (**AT+CMGF=1**). It is possible to set the validity period starting from when the SMS 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). **OK**
Maximum Response Time	300 ms
Characteristics	/
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 (refer to **<dt>**).
<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.

9.16. AT+QCMGS   Send Concatenated Messages

This command sends 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 If text mode (**AT+CMGF=1**): **AT+QCMGS=<da>[,<toda>],<uid>,<m**	Response If in text mode (**AT+CMGF=1**) and sent successfully: **+QCMGS: <mr>**

sg_seg>,<msg_total><CR> >text is entered **<Ctrl+Z/ESC>** Send the message/Quit the sending	**OK** Or **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	120 s, determined by network.
Characteristics	/

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: 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: ignore the value and regard it as a non-concatenated message.
<da>	Please refer to **AT+CMGS**.
<toda>	Please refer to **AT+CMGS**.
<mr>	Please refer to **AT+CMGS**.
<err>	Error codes. For more details, please refer to **Chapter 14.6**.

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	
+QCMGS: 190	
OK	
AT+QCMGS="15056913384",120,2,2	//Send the second segment of the concatenated SMS.
>EFGH	
+QCMGS: 191	
OK	

9.17. 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. **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 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>,<dc**

	s>,[<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
	If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	Depends on the length of message content.
Characteristics	/

Parameter

<uid>	Integer type. Message identification in the user data header (UDH). Range: 0–65535 (see NOTE). 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.
<err>	Error codes. For more details, please refer to *Chapter 14.6*.

NOTE

1. Please refer to **AT+CMGR** for details of other parameters in this command.
2. 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.
3. 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",,"13/07/30,14:44:37+32",120,1,2
ABCD

OK
AT+QCMGR=4   //Read the second segment of the concatenated message.
+QCMGR: "REC UNREAD","+8615056913384",,"13/07/30,14:44:37+32",120,2,2
EFGH

OK

10 Packet Domain Commands

10.1. AT+CGATT Attachment or Detachment of PS

This Write Command attaches the MT to, or detaches 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 will be 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** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	140 s, determined by network.
Characteristics	Whether the command takes effect determined by network. 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
	Other values are reserved and will result in an **ERROR** response to the Write Command.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

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	

10.2. 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>,(**range of supported **<data_comp>**s),** **(**range of supported **<head_comp>**s**),(**list of supported **<IPv4_addr_alloc>**s**),(**list of supported **<request_type>**s**)** **OK**
Read Command **AT+CGDCONT?**	Response **+CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>,<IPv4_addr_alloc>,<request_type>** **[…]** **OK**
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<data_comp>[,<head_comp>[,<IPv4_addr_alloc>[,<request_type>]]]]]]]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically.

Reference
3GPP TS 27.007

Parameter

<cid>	Integer type. 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>	String type. Packet data protocol type, a string parameter which specifies the type of packet data protocol. "IP" IPv4. Internet protocol (IETF STD 5) "PPP" Point to Point Protocol (IETF STD 51) "IPV6" Internet Protocol, version 6 (see RFC 2460) "IPV4V6" Virtual introduced to handle dual IP stack UE capability (see RFC 2460)
<APN>	String type. 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>	String type. 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 with **AT+CGPADDR**.
<data_comp>	Integer type. Controls PDP data compression (applicable for SNDCP only) (refer to *3GPP TS 44.065*). 0 Off 1 On (Manufacturer preferred compression) 2 V.42bis
<head_comp>	Integer type. Control PDP header compression (refer to *3GPP TS 44.065* and *3GPP TS 25.323*). 0 Off 1 On 2 RFC1144 3 RFC2507 4 RFC3095
<IPv4_addr_alloc>	Integer type. Control how the MT/TA requests to get the IPv4 address information. 0 IPv4 address allocation through NAS signaling 1 IPv4 address allocated through DHCP
<request_type>	Integer type. Indicate the type of PDP context activation request for the PDP context. 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific).

| 1 | PDP context is for emergency bearer services. |

10.3. 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. This Read Command returns the current settings for each defined context. Details can be found in *3GPP TS 23.107*.

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

<cid>	Integer type. Specify a particular PDP context definition (see **AT+CGDCONT**).
<PDP_type>	String type. PDP type.

"IP"　　　　IPv4. Internet protocol (IETF STD 5)

"PPP"　　　Point to Point Protocol (IETF STD 51)

"IPV6"　　　Internet Protocol, version 6 (see RFC 2460)

"IPV4V6"　　Virtual introduced to handle dual IP stack UE capability (see RFC 2460)

<precedence> Integer type. Specify 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> Integer type. Specify the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. See *Table 5* for details.

0　Network subscribed value

1　< 0.5

2　< 5

3　< 50

4　Unspecified

<reliability> Integer type. Specify 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> Integer type. Specify 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\>	Integer type. Specify the mean throughput class, in octets per second.	
	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. For more details, please refer to **Chapter 14.5**.	

Table 5: 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	-

10.4. 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. This 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. Details can be found in *3GPP TS 23.107*.

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

<cid>	Integer type. Specify a particular PDP context definition (see **AT+CGDCONT**).
<PDP_type>	String type. PDP type.
	"IP" IPv4. Internet protocol (IETF STD 5)
	"PPP" Point to Point Protocol (IETF STD 51)
	"IPV6" Internet Protocol, version 6 (see RFC 2460)
	"IPV4V6" Virtual introduced to handle dual IP stack UE capability (see RFC 2460)
<precedence>	Integer type. Specify 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>	Integer type. Specify the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. See *Table 5* for details.
	<u>0</u> Network subscribed value
	1 < 0.5
	2 < 5
	3 < 50
	4 Unspecified
<reliability>	Integer type. Specify the reliability class.
	<u>0</u> 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>	Integer type. Specify the peak throughput class, in octets per second.
	<u>0</u> 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>	Integer type. Specify the mean throughput class, in octets per second.	
	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. For more details, please refer to *Chapter 14.5*.	

10.5. AT+CGACT   Activate or Deactivate PDP Context

This Write Command activates or deactivates the specified PDP context(s). After the command has 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>** **[+CGACT: <cid>,<state>** **…]** **OK**

Write Command **AT+CGACT=<state>,<cid>**	Response **OK** Or **NO CARRIER** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	150 s, determined by network.
Characteristics	Whether the command takes effect is determined by network. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<state>	Integer type. Indicate 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>	Integer type. Specify a particular PDP context definition (see **AT+CGDCONT**).
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

If VoLTE feature is enabled, **<cid>** holds a range from 1 to 5.

Example

```
AT+CGDCONT=1,"IP","UNINET"        //Define PDP context.
OK
AT+CGACT=1,1                      //Activated PDP.
OK
AT+CGACT=0,1                      //Deactivated the PDP.
OK
```

10.6. 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. Any command 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** response. 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	Whether the command takes effect is determined by network. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<L2P>	String type. Indicate 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 will result in an **ERROR** response to the Write Command
<cid>	Integer type. Specify a particular PDP context definition (see **AT+CGDCONT**).
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

10.7. 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>** **[+CGPADDR: <cid>,<PDP_addr>** **…]** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	Whether the command takes effect is determined by network. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

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

Example

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

10.8. 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** 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.
Reference 3GPP TS 27.007	

Parameter

<class>	String type. Indicate 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)
	"CG" Class-C mode of operation in PS only mode (A/Gb mode), or PS mode of operation (Iu mode)
	Other values are reserved and will result in an **ERROR** response to the Write Command
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

> **NOTE**
>
> **<class>** B means that the MT would operate PS or CS services but not simultaneously;
> **<class>** CG means that the MT would only operate PS services;

10.9. AT+CGREG   PS Domain Network Registration Status

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

AT+CGREG PS Domain Network Registration Status	
Test Command **AT+CGREG=?**	Response **+CGREG: (**list 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 configurations can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<n>   Integer type. Control the presentation of the specified URC.
    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. 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 GPRS service is disabled, but the UE is allowed to attach for GPRS 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. UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED.

		The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.
	3	Registration denied. The UE is in GMM state GMM-NULL. The GPRS service is disabled, and the UE is not allowed to attach for GPRS if requested by the user.
	4	Unknown
	5	Registered, roaming
<lac>		String type. Two-byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>		String type. 16-bit (GSM) or 28-bit (LTE) cell ID in hexadecimal format
<AcT>		Integer type. Access technology selected.
	0	GSM
	7	E-UTRAN

Example

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

+CGREG: 2
AT+CGATT=1
OK

+CGREG: 1,"D504","80428B5",7
```

10.10. AT+CGEREP   Packet Domain Event Reporting

This Write Command enables or disables sending of unsolicited result codes **+CGEV** 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.

AT+CGEREP Packet Domain Event Reporting	
Test Command **AT+CGEREP=?**	Response **+CGEREP: (**list 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 can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<mode>	Integer type. Control the processing of unsolicited result codes specified within this command.
	0 Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
	1 Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode), otherwise forward them directly to the TE.
<bfr>	Integer type. Control the effect on buffered codes.
	0 MT buffer of unsolicited result codes defined within this command is cleared when **<mode>**=1 is specified.
	1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when **<mode>**=1 is specified (**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.

10. **+CGEV: PDN DEACT <cid>**: Deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM.

Example

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

OK
AT+CGEREP?
+CGEREP: 0,0

OK

10.11. 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: (**range of supported **<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	
Reference 3GPP TS 27.007	

Parameter

<service>	Integer type. Indicate the service or service preference to be used.
	0 PS domain
	1 Circuit switch
	2 PS domain preferred (use circuit switched if PS domain not available)
	3 Circuit switch preferred (use PS domain if circuit switched not available)
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

10.12. AT+CEREG   EPS Network Registration Status

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

AT+CEREG EPS Network Registration Status	
Test Command **AT+CEREG=?**	Response **+CEREG: (**list of supported **<n>**s**)** **OK**
Read Command **AT+CEREG?**	Response **+CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]]** **OK**
Write Command **AT+CEREG[=<n>]**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations can be saved with **AT&W**.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type. Control the presentation of an unsolicited result code **+CEREG: <stat>**.	
	0	Disable network registration unsolicited result code
	1	Enable network registration unsolicited result code **+CEREG: <stat>**
	2	Enable network registration and location information unsolicited result code **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]**
<stat>	Integer type.	
	0	Not registered. MT is not currently searching an operator to register to
	1	Registered, home network
	2	Not registered, but MT is currently trying to attach or searching an operator to register to
	3	Registration denied
	4	Unknown
	5	Registered, roaming
<tac>	String type. Two-byte tracking area code in hexadecimal format.	
<ci>	String type. 28-bit E-UTRAN cell ID in hexadecimal format.	
<AcT>	Integer type. Access technology selected.	
	0	GSM
	7	E-UTRAN

10.13. AT+QGDCNT   Packet Data Counter

This command allows the application to check how many bytes are sent to 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	Whether the command takes effect is determined by network. The configuration will not be saved.

Parameter

\<op\>	Integer type. The operation about data counter.
	0 Reset the data counter
	1 Save the results of data counter to NV
	If results need to be automatically saved, please refer to **AT+QAUGDCNT**.
\<bytes_sent\>	Integer type. The amount of sent bytes.
\<bytes_recv\>	Integer type. The amount of received bytes.
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

When the MT is powered on, **\<bytes_sent\>** and **\<bytes_recv\>** are 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 the data counter.
OK
```

10.14. 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	Whether the command takes effect is determined by network. The configuration will not be saved.

Parameter

<value>	Integer type. This parameter is the time-interval for **AT+QGDCNT** to save results to NV automatically. Range: 0, 30–65535; default: 0; unit: second. If it is set to 0, auto-save feature is disabled.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

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


OK
AT+QGDCNT=35         //Set <value> to 35.
OK
AT+QAUGDCNT?         //Query the interval of auto-save.
+QAUGDCNT: 35
```

OK

10.15. AT+CGCONTRDP   PDP Context Read Dynamic Parameters

AT+CGCONTRDP PDP Context Read Dynamic Parameters	
Test Command **AT+CGCONTRDP=?**	Response **+CGCONTRDP: (**list of supported **<cid>**s**)** **OK**
Write Command **AT+CGCONTRDP[=<cid>]**	Response **+CGCONTRDP: <cid>,<bearer_id>,<APN>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_a ddr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_S ignalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Of fload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_ rate_control_value>]]]]]]]]]]]]]]** **[+CGCONTRDP: <cid>,<bearer_id>,<APN>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_a ddr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_S ignalling_Flag>[,<LIPA_indication>[,<IPv4_MTU>[,<WLAN_Of fload>[,<Local_Addr_Ind>[,<Non-IP_MTU>[,<Serving_PLMN_ rate_control_value>]]]]]]]]]]]]]]** **[...]** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<cid>	Integer type. Specify a particular non-secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related command.
<bearer_id>	Integer type. Identify the bearer, i.e. the EPS bearer in EPS and the NSAPI in GPRS. 1 A RmNet call is ready and MCU can get IP addresses by DHCP or

	QMI
	2 A RmNet call is connected
\<APN\>	String type. A logical name that was used to select the GGSN or the external packet data network.
\<local_addr and subnet_ mask\>	String type. Show the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0–255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3. m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.
\<gw_addr\>	String type. Show the gateway address of the MT. The string is given as dot-separated numeric (0–255) parameters.
\<DNS_prim_addr\>	String type. Shows the IP address of the primary DNS server.
\<DNS_sec_addr\>	String type. Shows the IP address of the secondary DNS server.
\<P_CSCF_prim_addr\>	String type. Shows the IP address of the primary P-CSCF server.
\<P_CSCF_sec_addr\>	String type. Shows the IP address of the secondary P-CSCF server.
\<IM_CN_Signalling_Flag\>	Integer type. Shows whether the PDP context is for IM CN subsystem-related signalling only or not. 0 PDP context is not for IM CN subsystem-related signalling only 1 PDP context is for IM CN subsystem-related signalling only
\<LIPA_indication\>	Integer type. Indicate that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE. 0 Indication not received that the PDP context provides connectivity using a LIPA PDN connection 1 Indication received that the PDP context provides connectivity using a LIPA PDN connection
\<IPv4_MTU\>	Integer type. Show the IPv4 MTU size in octets.
\<WLAN_Offload\>	Integer type. Indicate whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bits 1 and 2 of the WLAN offload acceptability IE as specified in *3GPP TS 24.008 subclause 10.5.6.20*. 0 Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable. 1 Offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode. 2 Offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode. 3 Offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable.
\<Local_Addr_Ind\>	Integer type. Indicate whether or not the MS and the network support local IP address in TFTs (see *3GPP TS 24.301* and *3GPP TS 24.008 subclause 10.5.6.3*) 0 Indicate that the MS or the network or both do not support local IP address in TFTs 1 Indicate that the MS and the network support local IP address in

	TFTs
<Non-IP_MTU>	Integer type. Show the Non-IP MTU size in octets.
<Serving_PLMN_rate_cont rol_value>	Integer type. Indicate the maximum number of uplink messages the UE is allowed to send in a 6-minute interval. This refers to octet 3 to 4 of the Serving PLMN rate control IE as specified in *3GPP TS 24.301 subclause 9.9.4.28*.

10.16. AT+QNETDEVCTL   Configure Network Adapter Data Call

This command connects or disconnects network adapter data call.

AT+QNETDEVCTL Configure Network Adapter Data Call	
Test Command **AT+QNETDEVCTL=?**	Response **+QNETDEVCTL: (**list of supported **<connect_type>**s)**,(**range of supported **<CID>**s)**,(**range of supported **<URC_switch>**s)** **OK**
Read Command **AT+QNETDEVCTL?**	Response **+QNETDEVCTL: <connect_type>,<CID>,<URC_switch>, <PDN_status>** **OK**
Write Command **AT+QNETDEVCTL=<connect_type>[, <CID>[,<URC_switch>]]**	Response **OK** Or **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will be saved automatically if **<connect_type>**=3. The configurations will not be saved if **<connect_type>**=1.

Parameter

<connect_type>	Integer type. Network adapter connection type.
	0　Disconnect network adapter
	1　Manually connect the network adapter
	3　Automatically connect to the network adapter. If the connection fails, it will retry every 2 seconds, 4 seconds, 8 seconds, 16 seconds, 32 seconds..., the maximum interval time is 5 minutes.
<CID>	Integer type. PDP context index number. Range: 1–7.
<URC_switch>	Integer type. Whether to enable the reporting of URC **+QNETDEVSTATUS: <status>**.
	<u>0</u>　Disable
	1　Enable
<status>	Integer type. Network adapter connection status.
	0　Failure
	1　Success
<PDN_status>	Integer type. PDN connection status.
	0　Not connected
	1　Connected
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

NOTE

When **<connect_type>**=1/3, if **<URC_switch>** is not specified, URC will not be reported.

Example

AT+QNETDEVCTL=1,1,1	//Manually connect the network adapter. Use the first PDP, and enable the URC report.
OK	
+QNETDEVSTATUS: 1	
AT+QNETDEVCTL=0	//Disconnect network adapter.
OK	
AT+QNETDEVCTL=3,2	//Automatically connect to the network adapter. Use the second PDP, and disable the URC report.
OK	
AT+QNETDEVCTL?	
+QNETDEVCTL: 3,2,0,1	
OK	

---

11 Supplementary Service Commands

11.1. AT+CCFC   Call Forwarding Number and Conditions Control

This command allows control of the call forwarding supplementary service according to *3GPP TS 22.082*. Registration, erasure, activation, deactivation and status query are supported. TA controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

AT+CCFC Call Forwarding Number and Conditions Control	
Test Command **AT+CCFC=?**	Response **+CCFC: (**range of supported **<reason>**s**)** **OK**
Write Command **AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,time]]]]]]**	Response If **<mode>** is not equal to 2 and the command is executed successfully: **OK** If **<mode>**=2 and the command is executed successfully: If call forwarding numbers are registered: **+CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]]** **[…]** **OK** If no call forwarding numbers are registered (and therefore all classes are inactive): **+CCFC: <status>,<class>** **OK** where **<status>**=0 and **<class>**=1 If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms

Characteristics	Whether this command takes effect depends on the network status.
	The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<reason>	Integer type. Configure the forwarding conditions.
	0 Unconditional
	1 Mobile busy
	2 No reply
	3 Not reachable
	4 All call forwarding (0–3)
	5 All conditional call forwarding (1–3)
<mode>	Integer type. Control the call forwarding supplementary service.
	0 Disable
	1 Enable
	2 Query status (**<reason>**=0,1,2,3)
	3 Registration
	4 Erasure
<number>	Phone number in string type of forwarding address in format specified by **<type>**.
<type>	Integer type. Type of address. Default value: 145 when dialing string includes international access code character "+" and 129 otherwise.
<subaddr>	String type sub-address of format specified by **<satype>**.
<satype>	Type of sub-address in integer.
<class>	Integer type. Information class.
	<u>1</u> Voice
	2 Data
	4 FAX
	8 Short message service
<time>	Integer type. When "no reply" (**<reason>**=2) is enabled or queried, this gives the time in seconds to wait before call is forwarded for no reply. Range: 1–30. Default: 20.
<status>	Integer type.
	0 Not active
	1 Active
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

Example

AT+CCFC=0,3,"15021012496"	//Register the destination number for unconditional call forwarding (CFU).
OK	
AT+CCFC=0,2	//Query the status of CFU without specifying **<class>**.
+CCFC: 1,1,"+8615021012496",145,,,	
OK	
AT+CCFC=0,4	//Erase the registered CFU destination number.
OK	
AT+CCFC=0,2	//Query the status, no destination number.
+CCFC: 0,1	
OK	

11.2. AT+CCWA   Call Waiting Control

This command allows control of the call waiting supplementary service according to *3GPP TS 22.083*. Activation, deactivation and status query are supported. TA controls the call waiting supplementary service with the Write Command. Activation, deactivation and status query are supported.

AT+CCWA Call Waiting Control	
Test Command **AT+CCWA=?**	Response **+CCWA: (**list of supported **<n>**s**)** **OK**
Read Command **AT+CCWA?**	Response **+CCWA: <n>** **OK**
Write Command **AT+CCWA=<n>[,<mode>[,<class>]]**	Response If **<mode>** is not equal to 2 and the command is executed successfully: **OK** If **<mode>**=2 and the command is executed successfully: **+CCWA: <status>,<class1>** **[+CCWA: <status>,<class2>** **...]** **OK**

	If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	If **<mode>** is omitted, whether this command takes effect depends on the network status; If **<mode>** is specified, this command takes effect immediately. The configurations will not be saved.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type. Disable or enable the presentation of an unsolicited result code.
	<u>0</u> Disable presentation of an unsolicited result code
	1 Enable presentation of an unsolicited result code
<mode>	Integer type. When **<mode>** parameter is not given, network is not interrogated.
.	0 Disable
	1 Enable
	2 Query status
<class>	A sum of integers, each integer represents a class of information.
	1 Voice (telephony)
	2 Data (bearer service)
	4 FAX (facsimile)
<status>	Integer type. Disable or enable the call waiting supplementary service.
	0 Disable
	1 Enable
<number>	Phone number in string type of calling address in format specified by **<type>**.
<type>	Type of address octet in integer format.
	129 Unknown type (ISDN format)
	145 International number type (ISDN format)
<alpha>	Optional string type alphanumeric representation of **<number>** corresponding to the entry found in phonebook.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

1. **<status>**=0 should be returned only if service is not active for any **<class>** i.e. **+CCWA: 0,7** will be returned in this case.
2. When **<mode>**=2, all active call waiting classes will be reported. In this mode the command is aborted by pressing any key.
3. Unsolicited result code:
   When the presentation of call waiting at the TA is enabled (and call waiting is enabled) and a terminating call set up during an established call, an unsolicited result code is returned:
   +CCWA: <number>,<type>,<class>[,<alpha>]

Example

AT+CCWA=1,1	//Enable presentation of an unsolicited result code.
OK	
ATD10086;	//Establish a call.
OK	
+CCWA: "02154450293",129,1	//Indication of a call that has been waiting.

11.3. AT+CHLD   Call Related Supplementary Services

This command allows the control of the following call related services:

● A call can be temporarily disconnected from the MT but the connection is retained by the network;
● Multiparty conversation (conference calls);
● The served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection.

Calls can be put on hold, recovered, released and added to a conversation, and transferred similarly as defined in *3GPP TS 22.030*.

This is based on the GSM supplementary services HOLD (Call Hold; refer to *3GPP TS 22.083 clause 2*), MPTY (Multiparty; refer to *3GPP TS 22.084*) and ECT (Explicit Call Transfer; refer to *3GPP TS 22.091*). The interaction of this command with other commands based on other GSM supplementary services is described in the GSM standards. Call Hold, Multiparty and Explicit Call Transfer are only applicable to teleservice 11.

TA controls the supplementary services call hold, multiparty and explicit call transfer with the Write Command. Calls can be put on hold, recovered, released, added to conversation and transferred.

AT+CHLD   Call Related Supplementary Services

Test Command **AT+CHLD=?**	Response **+CHLD: (**list of supported **<n>**s**)** **OK**
Write Command **AT+CHLD=<n>**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	Whether this command takes effect depends on the network status. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<n>	0	Terminate all held calls or UDUB (User Determined User Busy) for a waiting call. If a call is waiting, terminate the waiting call. Otherwise, terminate all held calls (if any)
	1	Terminate all active calls (if any) and accept the other call (waiting call or held call).
	1X	Terminate the specific call number X (X=1-7)
	2	Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call
	2X	Place all active calls except call X (X=1-7) on hold
	3	Add the held call to the active calls
<err>	Error codes. For more details, please refer to ***Chapter 14.5***.	

Example

ATD10086;	//Establish a call.
OK	
+CCWA: "02154450293",129,1	//Indication of a call that has been waiting.
AT+CHLD=2	//Place the active call on hold and accept the waiting call as the active call.
OK	
AT+CLCC	
+CLCC: 1,0,1,0,0,"10086",129	//The first call is on hold.

```
+CLCC: 2,1,0,0,0,"02154450293",129          //The second call is active.

OK
AT+CHLD=21                                   //Place the active call except call X=1 on hold.
OK
AT+CLCC
+CLCC: 1,0,0,0,0,"10086",129                 //The first call is active.
+CLCC: 2,1,1,0,1,"02154450293",129           //The second call is on hold.

OK
AT+CHLD=3                                     //Add a held call to the active calls in order to set up a
                                               conference (multiparty) call.
OK
AT+CLCC
+CLCC: 1,0,0,0,1,"10086",129
+CLCC: 2,1,0,0,1,"02154450293",129

OK
```

11.4. AT+CLIP   Calling Line Identification Presentation

This command refers to the GSM supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. TA enables or disables the presentation of the calling line identity (CLI) at the TE with the Write Command. It has no effect on the execution of the supplementary service CLIP in the network.

AT+CLIP Calling Line Identification Presentation	
Test Command **AT+CLIP=?**	Response **+CLIP: (**list of supported **<n>**s) **OK**
Read Command **AT+CLIP?**	Response **+CLIP: <n>,<m>** **OK**
Write Command **AT+CLIP=<n>**	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

\<n\>	Integer type.
	0 Disable presentation of unsolicited result codes
	1 Enable presentation of unsolicited result codes
\<m\>	Integer type.
	0 CLIP not provisioned
	1 CLIP provisioned
	2 Unknown
\<number\>	Phone number in string type of calling address in format specified by **\<type\>**.
\<subaddr\>	String type sub-address of format specified by **\<satype\>**.
\<satype\>	Type of sub-address octet in integer format (refer to *3GPP TS 24.008 subclause 10.5.4.8*).
\<type\>	Type of address octet in integer format.
	129 Unknown type (ISDN format)
	145 International number type (ISDN format)
	161 National number
\<alpha\>	String type alphanumeric representation of **\<number\>** corresponding to the entry found in phonebook.
\<CLI_validity\>	Integer type.
	0 CLI valid
	1 CLI has been withheld by the originator
	2 CLI is not available due to interworking problems or limitations of originating network
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

Unsolicited result code:

When the presentation of the CLIP at the TE is enabled (and calling subscriber allows), an unsolicited result code is returned after every RING (or **+CRING: \<type\>**) at a mobile terminating call:

+CLIP: \<number\>,\<type\>,[subaddr],[satype],[\<alpha\>],\<CLI_validity\>

Example

AT+CPBW=1,"02151082965",129,"QUECTEL"
OK
AT+CLIP=1
OK
RING
+CLIP: "02151082965",129,,,"QUECTEL",0

11.5. AT+CLIR   Calling Line Identification Restriction

This command refers to the CLIR supplementary service (Calling Line Identification Restriction) according to *3GPP TS 22.081* and the OIR supplementary service (Originating Identification Restriction) according to *3GPP TS 24.607* that allows a calling subscriber to enable or disable the presentation of the calling line identity (CLI) to the called party when originating a call. TA restricts or enables the presentation of the calling line identity (CLI) to the called party when originating a call with the write command.

The Write Command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command.

AT+CLIR Calling Line Identification Restriction	
Test Command **AT+CLIR=?**	Response **+CLIR: (**range of supported **<n>**s**)** **OK**
Read Command **AT+CLIR?**	Response **+CLIR: <n>,<m>** **OK**
Write Command **AT+CLIR=<n>**	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

<n>	Integer type. Set the adjustment for outgoing calls.	
	<u>0</u>	Presentation indicator is used according to the subscription of the CLIR service
	1	CLIR invocation
	2	CLIR suppression
<m>	Integer type. Show the subscriber CLIR service status in the network.	
	0	CLIR not provisioned
	1	CLIR provisioned in permanent mode
	2	Unknown (e.g. no network, etc.)
	3	CLIR temporary mode presentation restricted
	4	CLIR temporary mode presentation allowed
<err>	Error codes. For more details, please refer to *Chapter 14.5*.	

11.6. AT+COLP   Connected Line Identification Presentation

This command refers to the GSM supplementary service COLP (Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.

Intermediate result code is returned from TA to TE before any +CR or V.25ter responses.

AT+COLP Connected Line Identification Presentation	
Test Command **AT+COLP=?**	Response **+COLP: (**list of supported **<n>**s**)** **OK**
Read Command **AT+COLP?**	Response **+COLP: <n>,<m>** **OK**
Write Command **AT+COLP=<n>**	Response **OK**
Maximum Response Time	15 s, determined by network.
Characteristics	/
Reference 3GPP TS 27.007	

Parameter

\<n>	Integer type. Set/show the result code presentation status in the TA.
	<u>0</u> Disable
	1 Enable
\<m>	Integer type. Show the subscriber COLP service status in the network.
	0 COLP not provisioned
	1 COLP provisioned
	2 Unknown (e.g. no network, etc.)
\<number>	String type. Phone number, the format is specified by **\<type>**.
\<type>	Integer type. Type of address octet in integer format.
	129 Unknown type (ISDN format number)
	145 International number type (ISDN format)
\<subaddr>	String type sub-address of format specified by **\<satype>**.
\<satype>	Integer type. Type of sub-address octet (refer to *3GPP TS 24.008 subclause 10.5.4.8*).
\<alpha>	Optional string type alphanumeric representation of **\<number>** corresponding to the entry found in phonebook.

NOTE

Intermediate result code:

When enabled (and called subscriber allows), an intermediate result code is returned before any +CR or V.25ter responses:

+COLP: \<number>,\<type>,[\<subaddr>],[\<satype>],[\<alpha>]

Example

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

OK
```

11.7. AT+CSSN   Supplementary Service Notifications

This command refers to network-initiated notifications related to supplementary service. This Write Command enables/disables the presentation of notification result codes from TA to TE.

AT+CSSN Supplementary Service Notifications	
Test Command **AT+CSSN=?**	Response **+CSSN: (**list of supported **<n>**s)**,**(list of supported **<m>**s**)** **OK**
Read Command **AT+CSSN?**	Response **+CSSN: <n>,<m>** **OK**
Write Command **AT+CSSN=<n>[,<m>]**	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

<n>	Integer type. Set/show the **+CSSI** intermediate result code presentation status to the TE.
	<u>0</u> Disable
	1 Enable
<m>	Integer type. Set/show the **+CSSU** unsolicited result code presentation status to the TE.
	<u>0</u> Disable
	1 Enable
<code1>	Integer type. It is manufacturer specific and supports the following codes:
	0 Unconditional call forwarding is active
	1 Some of the conditional call forwardings are active
	2 Call has been forwarded
	3 Waiting call is pending
	5 Outgoing call is barred
<code2>	Integer type. It is manufacturer specific and supports the following codes:
	0 The incoming call is a forwarded call
	2 Call has been put on hold (during a voice call)
	3 Call has been retrieved (during a voice call)
	5 Held call was terminated by another party

	10 Additional incoming call forwarded
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

1. When **<n>**=1 and a supplementary service notification is received after a mobile originated call setup, the **+CSSI** intermediate result code is sent to TE before any other MO call setup result codes:
    +CSSI: <code1>
2. When **<m>**=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, the **+CSSU** unsolicited result code is sent to TE:
    +CSSU: <code2>

11.8. 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.

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 URC **+CUSD**.

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. Set/show the result code presentation status to the TE.	
	<u>0</u>	Disable the result code presentation to the TE
	1	Enable the result code presentation to the TE. For an USSD response from the network, or a network-initiated operation, the format is: **+CUSD: <status>[,<rspstr>,[<dcs>]]**.
	2	Cancel session (not applicable to the response to Read Command)
<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 value: 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	Another local client has responded
	4	Operation not supported
	5	Network time out
<err>	Error codes. For more details, please refer to *Chapter 14.5*.	

12 Audio Commands

12.1. AT+CLVL Loudspeaker Volume Level Selection

This command selects the volume of the internal loudspeaker of the MT.

AT+CLVL Loudspeaker Volume Level Selection	
Test Command **AT+CLVL=?**	Response **+CLVL: (**range of supported **<level>**s**)** **OK**
Read Command **AT+CLVL?**	Response **+CLVL: <level>** **OK**
Write Command **AT+CLVL=<level>**	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 configurations will be saved.
Reference 3GPP TS 27.007	

Parameter

<level>	Integer type. Volume level with manufacturer specific range (the minimum value represents the lowest sound level). Range: 0–5. Default: 3.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

12.2. AT+QAUDLOOP   Enable/Disable Audio Loop Test

This command enables/disables audio loop test.

AT+QAUDLOOP Enable/Disable Audio Loop Test	
Test Command **AT+QAUDLOOP=?**	Response **+QAUDLOOP: (**list of supported **<enable>**s**)** **OK**
Read Command **AT+QAUDLOOP?**	Response **+QAUDLOOP: <enable>** **OK**
Write Command **AT+QAUDLOOP=<enable>**	Response **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<enable>	Integer type. Enable or disable audio loop test. 0 Disable 1 Enable
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

12.3. AT+QAUDRD   Record Audio File

This command records the uplink or downlink speech during voice call or record sound from local microphone in idle state and save it to files.

AT+QAUDRD Record Audio File	
Test Command **AT+QAUDRD=?**	Response **+QAUDRD: (**list of supported of **<state>**s**),<file_name>,(**list of supported **<format>),(**list of supported **<dlink>**s**)** **OK**

Read Command	Response
AT+QAUDRD?	**+QAUDRD: <state>**
	OK
Write Command	Response
AT+QAUDRD=<control>[,<file_name >[,<format>[,<dlink>]]]	**OK**
	Or
	ERROR
	If error is related to ME functionality:
	+CME ERROR: <err>
Maximum Response Time	300 ms
Characteristics	/

Parameter

<state>	Integer type.
	<u>0</u> Not recording
	1 Recording
<control>	Integer type.
	0 Stop recording
	1 Start recording
<file_name>	String type. Name of the recorded audio file, including file path (UFS directory by default), filename and filename extension.
<format>	Integer type. Format of the file.
	13 WAV_PCM16
<dlink>	Integer type. Record downlink sound.
	<u>0</u> Record uplink sound
	1 Record downlink sound
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

> **NOTE**
>
> 1. The module supports recorded audio files with a suffix ".wav" (**<format>**=13).
> 2. If the recording file's name and format are same with that of an existing file or an unknown error occurs, the module reports URC **+QAUDRIND: 0,1**.
> 3. If current recording is interrupted by other audio task, the module reports URC **+QAUDRIND: 0,6**.
> 4. If there is no space to record, the module reports URC **+QAUDRIND: 0,3**.
> 5. The module supports recording uplink and downlink audio data, but not simultaneous recording.
> 6. This command returns error if the file format is inconsistent with the filename extension.
> 7. Downlink record is prohibited in non-calling mode and uplink record is prohibited in calling mode.

Table 6: The Description of <code> in URC +QAUDRIND: 0,<code>

<code>	Meaning
0	Reserved
1	Unknown error
3	No space to record
6	Interrupted by other audio task

Example

AT+QAUDRD=1,"UFS:A.wav",13,0	//Record the uplink sound with wav format, store it in UFS.
OK	
AT+QAUDRD=0	//Stop recording.
OK	
AT+QAUDRD=1,"UFS:B.wav",13,1	//Record the downlink sound with wav format, store it in UFS.
OK	
AT+QAUDRD=0	//Stop recording.
OK	

12.4. AT+QPSND Play Audio File to Uplink or Downlink

This command plays local audio file to uplink or downlink. The applicable file formats include wav, pcm, amr, awb and mp3.

AT+QPSND Play Audio File to Uplink or Downlink	
Test Command **AT+QPSND=?**	Response **+QPSND: (**list of supported **<control>**s**),<file_name>,(**list of supported **<repeat>**s**),(**list of supported **<ulmute>**s**),(**list of supported **<dlmute>**s**)** **OK**
Read Command **AT+QPSND?**	Response **+QPSND: <state>** **OK**
Write Command **AT+QPSND=<control>,<file_name>,<** **repeat>[,<ulmute>[,<dlmute>]]**	Response **OK** Or **ERROR**

	If error is related to ME functionality: **+CME ERROR: \<err\>** After the playing is finished: **+QPSND: 0**
Maximum Response Time	300 ms
Characteristics	/

Parameter

\<state\>	Integer type. 0 Not playing 1 Playing
\<control\>	Integer type. 0 Stop playing 1 Start playing
\<file_name\>	String type. Name of the file to be played. including file path (UFS directory by default), filename and filename extension.
\<repeat\>	Integer type. Repeat play or not. 0 Play only once 1 Repeat playing
\<ulmute\>	Integer type. Mute uplink or not. 0 Mute 1 Not mute
\<dlmute\>	Integer type. Mute downlink or not. 0 Mute 1 Not mute
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

1. The module only supports 8 kHz liner, mono wave format while playing audio file to uplink.
2. Downlink playback is prohibited in calling mode and uplink playback is prohibited in non-calling mode.
3. If an unknown error occurs, the module reports URC **+QPSND: 0,1**.

Example

AT+QPSND=1,"UFS:A.wav",0	//Play a wave file which is stored in UFS.
OK	
+QPSND: 0	
AT+QPSND=1,"UFS:A.wav",0,1,0	//Play a wave file to a remote subscriber when a call is ongoing.
OK	
+QPSND: 0	//Finish the playing.

NOTE

AT+QPSND does not support both **<ulmute>** and **<dlmute>** to be 0 or 1 at the same time.

12.5. AT+QAUDPLAY   Play Audio File to Downlink

This command plays local audio file to downlink. The applicable file formats include wav, pcm, amr, awb and mp3.

AT+QAUDPLAY Play Audio File to Downlink	
Test Command **AT+QAUDPLAY=?**	Response **+QAUDPLAY: <file_name>,(**list of supported **<state>**s**)** **OK**
Read Command **AT+QAUDPLAY?**	Response **+QAUDPLAY: <state>** **OK**
Write Command **AT+QAUDPLAY=<file_name>,<repeat>**	Response **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR: <err>** After the playing is finished: **+QAUDPLAY: 0**
Maximum Response Time	300 ms

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

Parameter

<state>	Integer type. Module status.
	0 Not playing
	1 Playing
<file_name>	String type. Name of the file to be played, including file path (UFS directory by default), filename and filename extension.
<repeat>	Integer type. Whether to play the file repeatedly.
	0 Play only once
	1 Repeat
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

NOTE

1. If an unknown error occurs, the module reports URC **+QAUDPIND: 0,1**.
2. If current playing is interrupted by other audio tasks, the module reports URC **+QAUDPIND: 0,6**.

12.6. AT+QAUDMOD   Set Audio Mode

This command sets the audio mode required for the connected device. It will take effect at next sound activity.

AT+QAUDMOD Set Audio Mode	
Test Command **AT+QAUDMOD=?**	Response **+QAUDMOD: (range of supported <mode>s)** **OK**
Read command **AT+QAUDMOD?**	Response **+QAUDMOD: <mode>** **OK**
Write Command **AT+QAUDMOD=<mode>**	Response **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**

Maximum Response Time	300 ms
Characteristics	The command takes effect at next sound activity. The configuration will be saved automatically.

Parameter

<mode>	Integer type. Indicate the current audio mode.
	<u>0</u> Echo canceller, noise suppressor, digital gain and calibration parameter for Handset.
	1 Echo canceller, noise suppressor, digital gain and calibration parameter for Headset.
	2 Echo canceller, noise suppressor, digital gain and calibration parameter for Speaker.
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

12.7. AT+QIIC IIC Read/Write

This command reads or writes to the IIC register from peripheral devices.

AT+QIIC IIC Read/Write	
Test Command **AT+QIIC=?**	Response **+QIIC: (**list of supported **<rw>**s**),(**range of supported **<device>**s**),(**range of supported **<addr>**s**),(**list of supported **<bytes>**s**),(**range of supported **<value>**s**)** **OK**
Write Command **AT+QIIC=<rw>,<device>,<addr>,<byt es>[,<value>]**	Response If the optional parameter is specified: **OK** If the optional parameter is omitted: **+QIIC: <value>** **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effects after rebooting. The configuration will not be saved.

Parameter

<rw>	Integer type.
	0 Write Command
	1 Read Command
<device>	Integer type in Hex. 7-bit device address. Range: 0-0xff. Only ALC5616 device address
	0x1B is supported currently.
<addr>	Integer type in Hex. Register address. Range: 0-0xff.
<bytes>	Integer type.
	1 Read/write one byte
	2 Read/write two bytes
<value>	Integer type in Hex. The written value. Range: 0-0xffff.

NOTE

1. This parameter is hexadecimal, please add prefix "0x" for **<device>,<addr>,<value>**.

2. **<device>** is slave device address (7 bit, not include read/write bit), please find it on device datasheet, and only support ALC5616 now.

Example

AT+QIIC=0,0x1B,0x00,2,0x0000 //Write the register value. Device address: 0x1B. Register address:

0x00. Write two bytes.

OK

AT+QIIC=1,0x1B,0x00,2   //Read register value, slave address: 0x1B, register address: 0x00,

read two bytes.

+QIIC: 0x0000

OK

12.8. AT+QAUDSW   Codec Switch

This command switches the built-in or external codec.

AT+QAUDSW Codec Switch	
Test Command **AT+QAUDSW=?**	Response **+QAUDSW:** (list of supported**<n>**s) **OK**
Read Command **AT+QAUDSW?**	Response **+QAUDSW: <n>**

	OK
Write Command **AT+QAUDSW=<n>**	Response **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration will not be saved.
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type. 0 External codec <u>1</u> Built-in codec
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

12.9. AT+QAUDPASW   Switch Audio PA Type

This command switches the audio PA type.

AT+QAUDPASW Switch Audio PA Type	
Test Command **AT+QAUDPASW=?**	Response **+QAUDPASW:** (list of supported**<n>**s) **OK**
Read Command **AT+QAUDPASW?**	Response **+QAUDPASW: <n>** **OK**
Write Command **AT+QAUDPASW=<n>**	Response **OK** Or **ERROR** If error is related to ME functionality: **+CME ERROR: <err>**

Maximum Response Time	300 ms
Characteristics	The command takes effect after the module is rebooted. The configuration will not be saved.

Parameter

<n>	Integer type. PA type.
	<u>0</u> AB
	1 D
<err>	Error codes. For more details, please refer to *Chapter 14.5*.

12.10. AT+QTTS   Play Text

This command plays text.

AT+QTTS Play Text	
Test Command **AT+QTTS=?**	Response **+QTTS: (**range of supported **<mode>**s**),<text>** **OK**
Read Command **AT+QTTS?**	Response **+QTTS: <status>** **OK**
Write Command **AT+QTTS=<mode>[,<text>]**	Response **OK** Or **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>** When the text playback is completed: **+QTTS: 0**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configurations will not be saved.

Parameter

<mode>	Integer type. Start/stop playing and indicate **<text>** format. Range: 0–2.
	0 Stop playing, and **<text>** can be omitted.
	1 Start playing, and **<text>** uses UCS2 encoding.
	2 Start playing, and **<text>** is string type, usually ASCII characters, and is GBK encoding in Chinese.
<text>	String type. Text to be played. The text format depends on **<mode>**. Maximum length: 548 bytes.
<status>	Integer type. Status of the TTS player.
	<u>0</u> Idle
	1 Busy
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

NOTE

1. The module supports playing text with this command during a non-call process.
2. Text playing will be terminated during a call.
3. The module supports both text and audio playing, but asynchronously.

Example

AT+QTTS=?	//Test command.
+QTTS: (0-2),<text>	
OK	
AT+QTTS=1,"6B228FCE4F7F752879FB8FDC6A215757"	//Play a UCS2 string.
OK	
+QTTS: 0	
AT+QTTS=2,"hello world,你好"	//Play an ASCII string.
OK	
+QTTS: 0	
AT+QTTS=0	//Stop playing.
OK	

12.11. AT+QTTSETUP   Set Parameters for TTS

This command sets the TTS speed or adjusts the volume.

AT+QTTSETUP Set Parameters for TTS	
Test Command **AT+QTTSETUP=?**	Response **+QTTSETUP: (**list of supported **<mode>**s**),(**list of support ed **<ID>**s**),(**range of supported **<value>**s**)** **OK**
Read Command **AT+QTTSETUP?**	Response **OK**
Write Command **AT+QTTSETUP=<mode>,<ID>[,<value>]**	Response If **<mode>**=1, all parameters are specified: **OK** Or **ERROR** If **<mode>**=2, optional parameter should be omitted: **+QTTSETUP: 2,<ID>,<value>** 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

<mode>	Integer type. Write or read the parameter value.
	1 Write
	2 Read
<ID>	Integer type.
	1 Speed
	2 Volume
<value>	Integer type. Speed or volume value.
	If **<mode>**=2, **<value>** is omitted in the Write Command, and it means to read the current speed or volume value.
	Speed Range: -32768 to 32767. Normal speed: 0. Default value: 0.
	Volume Range: -32768 to 32767. Default value: 0.
<err>	Error codes. For more details, please refer to **Chapter 14.5**.

Example

AT+QTTSETUP=?	//Test command.
+QTTSETUP: (1,2),(1,2),(-32768-32767)	
OK	
AT+QTTSETUP=1,2,0	//Set the volume to 0.
OK	

13 Hardware Related Commands

13.1. AT+QPOWD   Power Off

This command powers down the module. UE returns **OK** immediately when the command is executed. Then UE deactivates the network. After the deactivation is completed, 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 off the power before the module's STATUS pin is set to low or **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
	<u>1</u> Normally power down

13.2. 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 configuration 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. For more details, please refer to *Chapter 14.5*.

Example

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

13.3. AT+CBC   Battery Charge

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

AT+CBC Battery Charge	
Test Command **AT+CBC=?**	Response **+CBC: (**range of supported **\<bcs\>**s**),(**range of supported **\<bcl\>**s**),\<voltage\>** **OK**
Execution Command **AT+CBC**	Response **+CBC: \<bcs\>,\<bcl\>,\<voltage\>** **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

\<bcs\>	Integer type. Battery charge status.	
	0	ME is not charging
	1	ME is charging
	2	Charging has been finished
\<bcl\>	Integer type. Battery charge level.	
	0–100	Remaining capacity percentage
\<voltage\>	Battery voltage. Unit: mV.	
\<err\>	Error codes. For more details, please refer to *Chapter 14.5*.	

13.4. 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: (**range of supported **<port>**s**)** **OK**
Read Command **AT+QADC=<port>**	Response **+QADC: <port>,<value>** **OK**
Maximum Response Time	300 ms
Characteristics	/

Parameter

<port>	Integer type. Channel number of the ADC. 0 ADC0 1 ADC1 2 ADC2 3 ADC3
<value>	Integer type. The voltage of specified ADC channel. Unit: mV.

> **NOTE**
>
> ADC3 is not supported by EC200U series module, and ADC2 and ADC3 are not supported by EG915U series module.

13.5. AT+QSCLK   Enable/Disable Sleep Mode

This command controls whether to enable sleep mode.

AT+QSCLK Enable/Disable Sleep Mode	
Test Command **AT+QSCLK=?**	Response **+QSCLK: (**list of supported **<n>**s**)** **OK**
Read Command **AT+QSCLK?**	Response **+QSCLK: <n>** **OK**
Write Command **AT+QSCLK=<n>**	Response **OK**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.
Reference Quectel	

Parameter

<n>	Integer type. Disable or enable sleep mode.
	<u>0</u> Disable
	1 Enable. It is controlled by DTR pin and WAKEUP_IN pin.
	2 Enable. If there is no data interaction in the UART within 5 seconds, the module will enter sleep mode and be waken up when there is data interaction.

NOTE

1. When sleep mode is enabled (**<n>**=1), and both DTR and WAKEUP_IN are pulled up, the module can directly enter sleep mode. If sleep mode is enabled, but both DTR and WAKEUP_IN are pulled down, only after the DTR and the WAKEUP_IN are pulled up, can the module enter sleep mode.
2. In sleep mode, waking up the main UART by AT command is supported.
3. In sleep mode, if the flow control of the main UART is not enabled, too much data (more than 127 bytes) cannot be sent to the module through the main UART directly. You need to exit from the sleep mode before sending too much data, otherwise, the data may be lost.

13.6. AT+QWIFISCAN Synchronously Scan Wi-Fi AP (Hotspot) Information

AT+QWIFISCAN Synchronously Scan Wi-Fi AP (Hotspot) Information	
Test Command **AT+QWIFISCAN=?**	Response **+QWIFISCAN: (**range of supported **<scan_time>**s)**,(**range of supported **<scan_round>**s)**,(** range of supported **<scan_num>**s**)** **OK**
Read Command **AT+QWIFISCAN?**	Response **+QWIFISCAN: <scan_time>,<scan_round>,<scan_num>** **OK** Or **ERROR**
Write Command **AT+QWIFISCAN=<scan_time>,<scan_round>,<scan_num>**	Response **[+QWIFISCAN: -,-,<rssival>,<mac>,<channel>]** **[…]** **OK** Or **ERROR**
Execution Command **AT+QWIFISCAN**	Response **[+QWIFISCAN: -,-,<rssival>,<mac>,<channel>]** **[…]** **OK** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<scan_time>	Integer type. The time required to scan a channel. Range: 4000–65000. Default value: 12000.
<scan_round>	Integer type. Scan cycle. Range: 1–3. Default value: 1.
<scan_num>	Integer type. The maximum number of APs scanned. Range: 4–30. Default value: 5.

<rssival>	Integer type. Hotspot signal strength. Range: -111 to -46.
<mac>	String in hexadecimal format. Hotspot Mac address.
<channel>	Integer type. AP channel. Range: 1–13.

NOTE

1. The Wi-Fi Scan function is optional, so **AT+QWIFISCAN** is only applicable to the module that supports such function.
2. When synchronously scanning AP information, the AP information will be reported firstly, and then **OK** is returned.
3. Execution command scans the Wi-Fi AP information using the default configuration.

Example

```
AT+QWIFISCAN=?
+QWIFISCAN: (4000-65000),(1-3),(4-30)

OK
AT+QWIFISCAN?              //Get the configurations of Wi-Fi AP information.
+QWIFISCAN: 12000,1,5

OK
AT+QWIFISCAN              //Use the default configuration to scan Wi-Fi AP information synchronously.
+QWIFISCAN: (-,-,-91,"44:00:4D:D5:26:E1",6)
+QWIFISCAN: (-,-,-90,"44:00:4D:D5:26:E0",6)
+QWIFISCAN: (-,-,-89,"44:00:4D:D5:27:01",11)
+QWIFISCAN: (-,-,-89,"44:00:4D:D5:27:00",11)

OK
AT+QWIFISCAN=10000,1,13  //Scan Wi-Fi AP information synchronously.
+QWIFISCAN: (-,-,-88,"44:00:4D:D5:26:E0",6)
+QWIFISCAN: (-,-,-86,"44:00:4D:D5:26:E1",6)
+QWIFISCAN: (-,-,-70,"44:00:4D:D5:27:00",11)
+QWIFISCAN: (-,-,-68,"44:00:4D:D5:27:01",11)

OK
```

13.7. AT+QWIFISCANEX   Asynchronously Scan Wi-Fi AP (Hotspot) Information

AT+QWIFISCANEX Asynchronously Scan Wi-Fi AP (Hotspot) Information	
Test Command **AT+QWIFISCANEX=?**	Response **+QWIFISCANEX: (**range of supported **<scan_time>**s**),(**range of supported **<scan_round>**s**),(** range of supported **<scan_num>**s**)** **OK**
Read Command **AT+QWIFISCANEX?**	Response **+QWIFISCANEX: <scan_time>,<scan_round>,<scan_num>** Or **ERROR**
Write Command **AT+QWIFISCANEX=<scan_time>,<scan_round>,<scan_num>**	Response **OK** **[+QWIFISCANEX: -,-,<rssival>,<mac>,<channel>]** **[…]** Or **ERROR**
Execution Command **AT+QWIFISCANEX**	Response **OK** **[+QWIFISCANEX: -,-,<rssival>,<mac>,<channel>]** **[…]** Or **ERROR**
Maximum Response Time	300 ms
Characteristics	The command takes effect immediately. The configuration will not be saved.

Parameter

<scan_time>	Integer type. The time required to scan a channel. Range: 4000–65000. Default value: 12000.
<scan_round>	Integer type. Scan cycle. Range: 1–3. Default value: 1.
<scan_num>	Integer type. The maximum number of APs scanned. Range: 4–30. Default value: 5.
<rssival>	Integer type. Hotspot signal strength. Range: -111 to -46.
<mac>	String in hexadecimal format. Hotspot Mac address.
<channel>	Integer type. AP channel. Range: 1–13.

NOTE

1. The Wi-Fi Scan function is optional, so **AT+QWIFISCANEX** is only applicable to the module that supports such function.
2. When asynchronously scanning AP information, **OK** will be reported firstly, and then the AP information is returned.
3. Execution command scans the Wi-Fi AP information using the default value.

Example

```
AT+QWIFISCANEX=?
+QWIFISCANEX: (4000-65000),(1-3),(4-30)

OK
AT+QWIFISCANEX?          //Get the configurations of Wi-Fi AP information scan.
+QWIFISCANEX: 12000,1,5

OK
AT+QWIFISCANEX          //Use the default configuration to scan Wi-Fi AP information asynchronously.
OK

+QWIFISCANEX: (-,-,-91,"44:00:4D:D5:26:E1",6)
+QWIFISCANEX: (-,-,-90,"44:00:4D:D5:26:E0",6)
+QWIFISCANEX: (-,-,-89,"44:00:4D:D5:27:01",11)
+QWIFISCANEX: (-,-,-89,"44:00:4D:D5:27:00",11)
AT+QWIFISCANEX=10000,1,13     //Scan Wi-Fi AP information asynchronously.
OK

+QWIFISCANEX: (-,-,-88,"44:00:4D:D5:26:E0",6)
+QWIFISCANEX: (-,-,-86,"44:00:4D:D5:26:E1",6)
+QWIFISCANEX: (-,-,-70,"44:00:4D:D5:27:00",11)
+QWIFISCANEX: (-,-,-68,"44:00:4D:D5:27:01",11)
```

14 Appendix

14.1. References

Table 7: Related Documents

Document Name
[1]   Quectel_EC200U&EG915U_Series_FILE_Application_Note

Table 8: Terms and Abbreviations

Abbreviation	Description
3GPP	3rd Generation Partnership Project
ACDB	Audio Calibration Database
ACK	Acknowledge Character
ACL	Access Control List
ADC	Analog-to-Digital Converter
AID	Application Identifier
AMR	Adaptive Multi-Rate
APN	Access Point Name
ARFCN	Absolute Radio-Frequency Channel Number
ASCII	American Standard Code for Information Interchange
BCD	Binary-Coded Decimal
CBM	Cell Broadcast Message
CCH	Control Channel

CDMA	Code Division Multiple Access
EFS	Embedded File System
CFU	Call Forwarding Unconditional
CLI	Calling Line Identity
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CMUX	Connection Multiplexing
COL	Connected Line
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CPT	Communication Production Technology
CS	Circuit Switching
CSD	Circuit Switch Data
DCD	Dynamic Content Delivery
DCD	Data Carrier Detection
DCE	Data Circuit-terminating Equipment
DCH	Data Channel
DCS	Data Coding Scheme
DFOTA	Delta Firmware Over-The-Air
DNS	Domain Name Server
DPCH	Dedicated Physical Channel
DRX	Discontinuous Reception
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTR	Data Terminal Ready

ECC	Emergency Call
ECT	Explicit Call Transfer supplementary service
EGPRS	Enhanced General Packet Radio Service
EMM	EPS Mobility Management
ENC	Encode
EONS	Enhanced Operator Name String
EPS	Evolved Packet System
ESM	EPS Session Management
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
EVDO	Evolution, Data Only
FDD	Frequency Division Duplexing
FDPCH	Fraction-Dedicated Physical Channel
FPLMN	Forbidden PLMN
FTM	Factory Test Mode
FTP(S)	File Transfer Protocol over SSL
GBK	Chinese Internal Code Specification
GERAN	GSM EDGE Radio Access Network
GGSN	Gateway GPRS Support Node
GMT	Greenwich Mean Time
GNSS	Global Navigation Satellite System
GPIO	General-Purpose Input/Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HDR	High-Dynamic Range
HSDPA	High Speed Downlink Packet Access

HSUPA	High Speed Uplink Packet Access
HTTP(S)	HyperText Transfer Protocol over SSL
ICCID	Integrated Circuit Card Identifier
ISDN	Integrated Services Digital Network
IETF	The Internet Engineering Task Force
IIC	Inter-Integrated Circuit
IMEI	International Mobile Equipment Identity
IMS	IP Multimedia Subsystem
IMSI	International Mobile Subscriber Identity
Ipv4	Internet Protocol version 4
Ipv6	Internet Protocol version 6
IRA	International Reference Alphabet
IRAT	Inter-Radio Access Technology
IWF	Interactive Website Framework
LIPA	Local IP Access
LTE	Long Term Evolution
MBN	Modem Software Configuration
MCC	Mobile Country Code
MCU	Microprogrammed Control Unit
ME	Mobile Equipment
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
MO	Mobile Originated
MPTY	MultiParty
MS	Mobile Station

MSC	Mobile Services Switching Center
MSISDN	Mobile Subscriber International ISDN/PSTN number
MT	Mobile Terminal
MTU	Maximum Transmission Unit
NMEA	National Marine Electronics Association
NITZ	Network Identity and Time Zone
NSAPI	Network Service Access Point Identifier
NV	Non-Volatile Random Access Memory
OIR	Originating Identification Restriction
PCM	Pulse Code Modulation
PDN	Public Data Network
PDP	Packet Data Protocol
PDU	Protocol Data Unit
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PPP	Point to Point Protocol
PSC	Primary Synchronization Code
PUK	Personal Identification Number Unlock Key
QCI	QoS Class Identifier
QMI	Qualcomm Message Interface
QoS	Quality of Service
RAT	Radio Access Technology
RDI	Remote Defect Indication
RI	Ring Indicator
RLP	Radio Link Protocol

RPLMN	Registered PLMN
RTC	Real Time Clock
RTS/CTS	Request To Send/Clear To Send
RSCP	Received Signal Code Power
RxQual	Receive Quality
SAP	Service Access Point
SDU	Service Data Unit
SMS	Short Message Service
SMSC	Short Message Service Center
SMTP	Simple Mail Transfer Protocol
SN	Serial Number
SNDCP	SubNetwork Dependent Convergence Protocol
SSL	Secure Sockets Layer
TA	Terminal Adapter
TCP	Transmission Control Protocol
TDD	Time Division Duplexing
TDSCDMA	Time Division-Synchronous Code Division Multiple Access
TE	Terminal Equipment
TFT	Traffic Flow Template
TTS	Text To Speech
UARFCN	UTRA Absolute Radio Frequency Channel Number
UART	Universal Asynchronous Receiver/Transmitter
UAC	USB Audio Class
UCS2	Unicode
UDH	User Data Header

UDI	Unique Device Identification
UDP	User Datagram Protocol
UDUB	User Determined User Busy
UE	User Equipment
UFS	User File System
UMTS	Universal Mobile Telecommunications System
UICC	Universal Integrated Circuit Card
URC	Unsolicited Result Code
USB	Universal Serial Bus
(U)SIM	Universal Subscriber Identity Module
USSD	Unstructured Supplementary Service Data
UTRAN	UMTS Terrestrial Radio Access Network
VoLTE	Voice over LTE
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network

14.2. Factory Default Settings Restorable with AT&F

Table 9: 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
ATS7	<n>	0
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CMEE	<n>	1
AT+CSCS	<chset>	"GSM"
AT+CSTA	<type>	129
AT+CR	<mode>	0
AT+CRC	<mode>	0
AT+CSMS	<service>	0
AT+CMGF	<mode>	0
AT+CSMP	<fo>,<vp>,<pid>,<dcs>	17,167,0,0
AT+CSDH	<show>	0
AT+CPMS	<mem1>,<mem2>,<mem3>	"ME","ME","ME"
AT+CNMI	<mode>,<mt>,<bm>,<ds>,<bfr>	2,1,0,0,0
AT+CMMS	<n>	0
AT+CVHU	<mode>	0
AT+CLIP	<n>	0
AT+COLP	<n>	0
AT+CLIR	<n>	0
AT+CSSN	<n>	0

AT+CTZR	<reporting>	0
AT+CPBS	<storage>	"SM"
AT+CGEREP	<mode>,<brf>	0,0
AT+CEREG	<n>	0
AT+CCWA	<n>	0
AT+CUSD	<mode>	0
AT+QAUDLOOP	<enable>	0

14.3. AT Command Settings Storable with AT&W

Table 10: AT Command Settings Storable with AT&W

AT Command	Parameters	Display with AT&V
ATE	<value>	Yes
ATQ	<n>	Yes
ATS0	<n>	Yes
ATS7	<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
AT+CEREG	<n>	No

14.4. AT Command Settings Storable with ATZ

Table 11: AT Command Settings Storable with ATZ

AT Command	Parameters	Factory Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATS7	<n>	0
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CEREG	<n>	0

14.5. Summary of 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 12: 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	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
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

14.6. Summary of 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 13: Different Coding Schemes of +CMS ERROR: <err>

Code of <err>	Meaning
107	Other General problems
300	ME failure
301	SMS ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode
305	Invalid text mode
310	SIM not inserted
311	SIM pin necessary
312	PH SIM pin necessary
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network
332	Network timeout
340	No +CNMA acknowledgement expected

350	Unknown
500	Unknown
510	Message blocked

14.7. Summary of URC

Table 14: 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 the ME, with location area code	AT+CREG=2
3	+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]	Indicate the change of the cell in E-UTRAN	AT+CREG=2
4	+CGREG: <stat>	Indicate network registration status of the ME	AT+CGREG=1
5	+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]	Indicate network registration and location information of the ME	AT+CGREG=2
6	+CTZV: <tz>	Time zone reporting	AT+CTZR=1
7	+CTZE: <tz>,<dst>,<time>	Extended time zone reporting	AT+CTZR=2
8	+CMTI: <mem>,<index>	New message is received, and saved to memory	See AT+CNMI
9	+CMT: [<alpha>],<length><CR><LF><pdu>	New short message is received and output directly to TE (PDU mode)	See AT+CNMI
10	+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
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
14	+COLP: <number>,<type>,[<subaddr>], [<satype>],[<alpha>]	The presentation of the COL (connected line) at the TE for a mobile originated call	AT+COLP=1
17	+CLIP: <number>,<type>,[subaddr],[s atype],[<alpha>],<CLI validity>	Mobile terminating call indication	AT+CLIP=1
18	+CRING: <type>	An incoming call is indicated to the TE with unsolicited result code instead of the normal RING	AT+CRC=1
19	+CCWA: <number>,<type>,<class>[,<alpha>]	Call waiting indication	AT+CCWA=1,1
20	+CSSI: <code1>	Shows the +CSSI intermediate result code presentation status to the TE	AT+CSSN=1
21	+CSSU: <code2>	Shows the +CSSU unsolicited result code presentation status to the TE	AT+CSSN=<n>,1
22	+CUSD: <status>[,<rspstr>,[<dcs>]]	USSD response from the network, or a network initiated operation	AT+CUSD=1
23	RDY	ME initialization is successful	N/A
24	+CFUN: 1	All function of the ME is available	N/A
25	+CPIN: <state>	SIM card pin state	N/A
26	+QIND: SMS DONE	SMS initialization finished	N/A
27	+QIND: PB DONE	Phonebook initialization finished	N/A
28	POWERED DOWN	Module power down	AT+QPOWD
29	+CGEV: REJECT <PDP_type>, <PDP_addr>	A network request for PDP activation, and was automatically rejected.	AT+CGEREP=1,1
30	+CGEV: NW REACT <PDP_type>, <PDP_addr>,	The network request PDP reactivation	AT+CGEREP=1,1

	[<cid>]		
31	+CGEV: NW DEACT <PDP_type>, <PDP_addr>, [<cid>]	The network has forced a context deactivation	AT+CGEREP=1,1
32	+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]	The ME has forced a context deactivation.	AT+CGEREP=1,1
33	+CGEV: NW DETACH	The network has forced a Packet Domain detach.	AT+CGEREP=1,1
34	+CGEV: ME DETACH	The mobile equipment has forced a Packet Domain detach.	AT+CGEREP=1,1
35	+CGEV: NW CLASS <class>	The network has forced a change of MS class.	AT+CGEREP=1,1
36	+CGEV: ME CLASS <class>	The mobile equipment has forced a change of MS class.	AT+CGEREP=1,1
37	+CGEV: PDN ACT<cid>	Activated the context	AT+CGEREP=1,1
38	+CGEV: PDN DEACT<cid>	Deactivated the context	AT+CGEREP=1,1
39	+USIM: 0	Use SIM card	N/A
40	+USIM: 1	Use USIM card	N/A
41	+QIND: "csq",<rssi>,<ber>	Indicate signal strength and channel bit error rate changes	See AT+QINDCFG
42	+QIND: "smsfull",<storage>	Indicates that the short message storage is full	See AT+QINDCFG
43	+QIND: "act",<actvalue>	Indicate network access technology changes	See AT+QINDCFG
44	+QIND: airplanestatus,<status>	After the flight mode control is turned on, it indicates the W_DISABLE# pin to change.	See AT+QCFG="airplanecontrol"
45	+QSIMSTAT: <enable>,<inserted_status>	Indicate (U) SIM card insertion and removal status	See AT+QSIMSTAT
46	+QCSQ: <sysmode>[,<value1>[,<value2>[,<value3>[,<value4>]]]]	When the signal strength changes, the MT actively reports the current signal strength through this URC.	See AT+QCSQ
47	+QNETDEVSTATUS: <status>	Indicate the connection status of the network card	See AT+QNETDEVCTL
48	+QAUDRIND: 0,<code>	Indicate the reason for the failure of audio recording	See AT+QAUDRD
49	+QAUDPIND: 0,1/+QAUDPIND: 0,6	Indicate the reason for the failure of audio playing.	See AT+QAUDPLAY

14.8. SMS Character Sets Conversions

In *3GPP TS 23.038* DCS (Data Coding Scheme) 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 (Data Coding Scheme) and **AT+CSCS** determine the way of SMS text input or output.

Table 15: 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 will convert IRA characters to GSM characters. Output: UE will convert GSM characters to IRA characters.
GSM 7 bit	UCS2	Input or output a hex string similar to PDU mode. So only support characters 0–9 and A–F. Input: UE will convert the UCS2 hex string to GSM characters. Output: UE will convert 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 16: 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

	0	1	2	3	4	5	6	7
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 17: 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

	0	1	2	3	4	5	6	7
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 18: 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 19: 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 20: 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

	0	1	2	3	4	5
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 21: 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 22: 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 bit 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. Please refer to *Table 15* for more details.

14.9. Release Cause Text List of AT+CEER

Table 23: List of Location ID List

Location ID	Meaning
0	CS internal cause
1	CS network cause
2	CS network reject
3	PS internal cause
4	PS network cause
5	PS LTE cause
6	PS LTE local cause

Table 24: List of Cause

CS Internal Cause	Meaning
-1	No cause information available (default)
0	Phone is offline
21	No service available
25	Network release, no reason given
27	Received incoming call
29	Client ended call
34	UIM not present
35	Access attempt already in progress
36	Access failure, unknown source
38	Concur service not supported by network
39	No response received from network

45	GPS call ended for user call
46	SMS call ended for user call
47	Data call ended for emergency call
48	Rejected during redirect or handoff
100	Lower-layer ended call
101	Call origination request failed
102	Client rejected incoming call
103	Client rejected setup indication
104	Network ended call
105	No funds available
106	No service available
108	Full service not available
109	Maximum packet calls exceeded
301	Video connection lost
302	Video call setup failure
303	Video protocol closed after setup
304	Video protocol setup failure
305	Internal error
CS Network Cause	**Meaning**
1	Unassigned/unallocated 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
26	Non selected user clearing
27	Destination out of order
28	Invalid/incomplete number
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 not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred within the CUG
57	Bearer capability not authorized
58	Bearer capability not available
63	Service/option not available
65	Bearer service not implemented
68	ACM >= ACM max

69	Requested facility not implemented
70	Only RDI bearer is available
79	Service/option not implemented
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented
100	Conditional IE error
101	Message not compatible with state
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified
CS Network Reject	**Meaning**
2	IMSI unknown in HLR
3	Illegal MS
4	IMSI unknown in VLR
5	IMEI not accepted
6	Illegal ME
7	GPRS services not allowed
8	GPRS and non GPRS services not allowed

9	MS identity cannot be derived
10	Implicitly detached
11	PLMN not allowed
12	Location area not allowed
13	Roaming not allowed
14	GPRS services not allowed in PLMN
15	No suitable cells in location area
16	MSC temporary not reachable
17	Network failure
20	MAC failure
21	Synch failure
22	Congestion
23	GSM authentication unacceptable
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporary out of order
38	Call cannot be identified
40	No PDP context activated
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent
98	Message type not compatible with state
99	Information element non-existent
101	Message not compatible with state
161	RR release indication

162	RR random access failure
163	RRC release indication
164	RRC close session indication
165	RRC open session failure
166	Low level failure
167	Low level failure no redial allowed
168	Invalid SIM
169	No service
170	Timer T3230 expired
171	No cell available
172	Wrong state
173	Access class blocked
174	Abort message received
175	Other cause
176	Timer T303 expired
177	No resources
178	Release pending
179	Invalid user data
PS Internet Cause	**Meaning**
0	Invalid connection identifier
1	Invalid NSAPI
2	Invalid primary NSAPI
7	PDP establish timeout
3	Invalid field
4	SNDCP failure

5	RAB setup failure
6	No GPRS context
8	PDP activate timeout
9	PDP modify timeout
10	PDP inactive max timeout
11	PDP lower layer error
12	PDP duplicate
13	Access technology change
14	PDP unknown reason
PS Network Cause	**Meaning**
25	LLC or SNDCP failure
26	Insufficient resources
27	Missing or unknown APN
28	Unknown PDP address or PDP type
29	User authentication failed
30	Activation rejected by GGSN
31	Activation rejected, unspecified
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporary out of order
35	NSAPI already used (not sent)
36	Regular deactivation
37	QoS not accepted
38	Network failure
39	Reactivation required

40	Feature not supported
41	Semantic error in the TFT operation
42	Syntactical error in the TFT operation
43	Unknown PDP context
44	PDP context without TFT already activated
45	Semantic errors in packet filter
46	Syntactical errors in packet filter
81	Invalid transaction identifier
95	Semantically incorrect message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented
100	Conditional IE error
101	Message not compatible with state
111	Protocol error, unspecified
PS LTE Cause	**Meaning**
8	Operator determined barring
26	Insufficient Resources
27	Missing or unknown APN
28	Unknown PDP address or PDP type
29	User Authentication failure
30	Activation rejected by Servicing GW or PDN GW
31	Activation rejected, unspecified
32	Service option not supported

33	Requested service option not subscribed
34	Service option temporarily out of order
35	PTI already In use
36	Regular deactivation
37	QoS not accepted
38	Network failure
39	Reactivation required
40	Feature not supported
41	Semantic error in the TFT operation
42	Syntactical error in the TFT operation
43	Unknown Bearer context
44	Semantic errors in packet filter
45	Syntactical errors in packet filter
46	Bearer Context without TFT already Active
47	PTI mismatch
49	PDN disconnected , not allowed
50	PDN type IPV4 only Allowed
51	PDN type IPV6 only Allowed
52	Single ADR bearers only Allowed
53	ESM info not received
54	PDN connection does not exist
55	Multiple PDN connection for given APN not allowed
56	Collision with network init request
59	Unsupported QCI value
81	Invalid PTI value

95	Systematically invalid message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	Info element non existent
100	Conditional IE error
101	Message type not compatible with state
111	Protocol error, unspecified
112	APN restrict value incompatible with ACT context
PS LTE Local Cause	**Meaning**
3	Illegal UE
6	Illegal ME
7	EPS services not allowed
9	UE id can't be driven by network
10	Implicitly Detached
11	PLMN not allowed
12	Tracking area not allowed
13	Roaming not allowed in this tracking area
15	No Suitable cells in tracking area
18	CS Domain Not available
25	Not Authorized for this CSG
38	CS fallback call EST not allowed
39	CS domain temporarily not allowed
43	Unknown EPS bearer context
256	Released AT RRC

257	Signal Connection Released
258	EMM detached
259	EMM attach failed
260	EMM attach started
261	NAS service request failed
262	ESM activate dedicated bearer reactivated by network
263	Lower layer failure
264	Lower layer failure
265	Network activate dedicated bearer with ID of deferred bearer
266	BAD OTA message
267	DS rejected the call
268	Context transferred due to IRAT
269	DS explicit deactivation
270	ESM MSGR failure
271	Local Cause not available
272	Rejected due to connected state
273	NAS Service request failed, no throttle
274	ACL failure
275	NAS Service request failed, DS disallow
276	EMM T3417 expired
277	EMM T3417 ext expired
278	NAS LRRC UL data CNF failure TXN
279	NAS LRRC UL data CNF failure HO
280	NAS LRRC UL data CNF failure CONN release
281	NAS LRRC UL data CNF failure RLF

282	NAS LRRC UL data CNF failure control Not CONN
283	NAS LRRC connection EST success
284	NAS LRRC connection EST failure
285	NAS LRRC connection EST failure, aborted
286	NAS LRRC connection EST failure, access barrer
287	NAS LRRC connection EST failure, CELL resel
288	NAS LRRC connection EST failure, config failure
289	NAS LRRC connection EST failure, timer expired
290	NAS LRRC connection EST failure, link failure
291	NAS LRRC connection EST failure, not camped
292	NAS LRRC connection EST failure, SI failure
293	NAS LRRC connection EST failure, CONN reject
294	NAS LRRC connection release normal
295	NAS LRRC connection release RLF
296	NAS LRRC connection release CRE failure
297	NAS LRRC connection release QOS during CRE
298	NAS LRRC connection release aborted
299	NAS LRRC connection release SIB read error
300	NAS LRRC connection release aborted IRAT success
301	NAS Reject LRRC radio link failure
302	NAS service request failure, LTE network reject
303	NAS detach with reattach, LTE network detach
304	NAS detach without reattach, LTE network detach