EC200T-CN
AT Commands Manual

LTE Standard Module Series

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About the Document

History

Revision	Date	Author	Description
1.0	2019-03-01	Jensen FANG/ Adolph WANG	Initial

Contents

Table Index

1 Introduction

1.1. Scope of the Document

This document presents the AT Commands Set for Quectel cellular engine EC200T-CN.

1.2. AT Command Syntax

The "**AT**" or "**at**" prefix must be set at the beginning of each command line. To terminate a command line enter **<CR>**. Commands are usually followed by a response that includes "**<CR><LF><response><CR><LF>**". Throughout this document, only the responses are presented, "**<CR><LF>**" are omitted intentionally.

The AT Commands Set implemented by EC200T-CN is a combination of 3GPP TS 27.007, 3GPP TS 27.005 and ITU-T recommendation V.25ter as well as the AT Commands developed by Quectel.

All these AT commands can be split into three categories syntactically: "**basic**", "**S parameter**", and "**extended**". They are listed as follows:

- **Basic syntax**

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

- **S parameter syntax**

These AT commands have 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 syntax**

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

Table 1: Types of AT Commands and Responses

Test Command	AT+<*x*>=?	This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
Read Command	AT+<*x*>?	This command returns the currently set value of the parameter or parameters.
Write Command	AT+<x>=<…>	This command sets the user-definable parameter values.
Execution Command	AT+<x>	This command reads non-variable parameters affected by internal processes in the UE.

1.3. Supported Character Sets

EC200T-CN AT command interface defaults to the **GSM** character set. EC200T-CN supports the following character sets:

- GSM format
- UCS2
- IRA

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

1.4. AT Command Interface

EC200T-CN 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.

1.5. 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 EC200T-CN without being requested by the TE and it is issued automatically when a certain event occurs. Typical events leading to URCs are incoming calls (**RING**), received short messages, high/low voltage alarm, high/low temperature alarm, etc.

1.6. 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 3s 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 within 65s, the VBAT shall be switched off compulsorily.

2 General Commands

2.1. ATI Display Product Identification Information

The command delivers a product information text.

ATI Display Product Identification Information	
Execution Command **ATI**	Response TA issues product information text. **Quectel** **EC200TCN** **Revision: <revision>** **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<revision>	Identification text of product software version

Example

```
ATI
Quectel
EC200TCN
Revision: EC200TCNDAR01A01M1G

OK
```

2.2. AT+GMI   Request Manufacturer Identification

The command returns a manufacturer identification text. See also **AT+CGMI**.

AT+GMI Request Manufacturer Identification	
Test Command **AT+GMI=?**	Response **OK**
Execution Command **AT+GMI**	Response TA reports one or more lines of information text which permits the user to identify the manufacturer. **Quectel** **OK**
Maximum Response Time	300ms
Reference V.25ter	

2.3. AT+GMM   Request TA Model Identification

The 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 TA returns a product model identification text. **EC200TCN** **OK**
Maximum Response Time	300ms
Reference V.25ter	

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

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

AT+GMR　Request TA Revision Identification of Software Release	
Test Command **AT+GMR=?**	Response **OK**
Execution Command **AT+GMR**	Response TA reports one or more lines of information text which permits the user to identify the revision of software release. **<revision>** **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<revision>	Identification text of product software version

Example

AT+GMR
EC200TCNDAR01A01M1G

OK

2.5. AT+CGMI　Request Manufacturer Identification

The command returns a manufacturer identification text. See also **AT+GMI**.

AT+CGMI　Request Manufacturer Identification	
Test Command **AT+CGMI=?**	Response **OK**
Execution Command **AT+CGMI**	Response TA returns manufacturer identification text. **Quectel**

	OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

2.6. AT+CGMM   Request Model Identification

The command returns a 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 TA returns product model identification text. **EC200TCN** **OK**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

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

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

AT+CGMR Request TA Revision Identification of Software Release	
Test Command **AT+CGMR=?**	Response **OK**
Execution Command **AT+CGMR**	Response TA returns identification text of product software version. **<revision>** **OK**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<revision>	Identification text of product software version

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

The command returns the International Mobile Equipment Identity (IMEI) number of ME. It is identical with **AT+CGSN**.

AT+GSN Request International Mobile Equipment Identity (IMEI)	
Test Command **AT+GSN=?**	Response **OK**
Execution Command **AT+GSN**	Response TA reports the IMEI (International Mobile Equipment Identity) number in information text which permits the user to identify the individual ME device. **<IMEI>** **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<IMEI>	IMEI of the ME

NOTE
The IMEI number varies with the individual ME device.

2.9. AT+CGSN   Request Product Serial Number Identification

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

AT+CGSN Request Product Serial Number Identification	
Test Command **AT+CGSN=?**	Response **OK**
Execution Command **AT+CGSN**	Response **\<IMEI\>** **OK**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

\<IMEI\>	IMEI of the ME

NOTE

The IMEI number varies with the individual ME device.

2.10. AT&F   Set all Current Parameters to Manufacturer Defaults

The command resets AT command settings to their factory default values.

AT&F Set all Current Parameters to Manufacturer Defaults	
Execution Command **AT&F[\<value\>]**	Response TA sets all current parameters to the manufacturer defined profile. See **Table 7**. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<value>	<u>0</u>	Set all TA parameters to manufacturer defaults

2.11. AT&V Display Current Configuration

The command displays the current settings of several AT command parameters, including the single-letter AT command parameters which are not readable otherwise.

AT&V Display Current Configuration	
Execution Command **AT&V**	Response TA returns the current parameter settings. See ***Table 2***. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Table 2: AT&V Response

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

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

The command stores the current AT command settings to a user defined profile in non-volatile memory.

AT&W Store Current Parameters to User Defined Profile	
Execution Command **AT&W[<n>]**	Response TA stores the current parameter settings in the user defined profile. See **Table 8**. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	<u>0</u>	Profile number to store current parameters

2.13. ATZ   Set all Current Parameters to User Defined Profile

The command restores the current AT command settings to the user defined profile in non-volatile memory, if they were stored with **AT&W** before. Any additional AT command on the same command line may be ignored.

ATZ Set all Current Parameters to User Defined Profile	
Execution Command **ATZ[<value>]**	Response TA sets all current parameters to the user defined profile. See **Table 9**. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<value>	<u>0</u>	Reset to profile number 0

2.14. ATQ   Set Result Code Presentation Mode

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

ATQ Set Result Code Presentation Mode	
Execution Command **ATQ\<n\>**	Response This parameter setting determines whether or not the TA transmits any result code to the TE. Information text transmitted in response is not affected by this setting. If **\<n\>**=0: **OK** If **\<n\>**=1: (none)
Maximum Response Time	300ms
Reference V.25ter	

Parameter

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

2.15. ATV   TA Response Format

The 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 of the use of each are listed in the following table.

ATV TA Response Format	
Execution Command **ATV\<value\>**	Response This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses. When **\<value\>**=0 **0** When **\<value\>**=1 **OK**

Maximum Response Time	300ms
Reference V.25ter	

Parameter

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

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

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

ATE Set Command Echo Mode	
Execution Command **ATE<value>**	Response This setting determines whether or not the TA echoes characters received from TE during command mode. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<value>	0	Echo mode OFF
	<u>1</u>	Echo mode ON

2.17. A/ Repeat Previous Command Line

The command repeats previous AT command line, and "/" acts as the line terminating character.

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

Example

ATI
Quectel
EC200TCN
Revision: EC200TCNDAR01A01M1G

OK
A/   //Repeat the previous command
Quectel
EC200TCN
Revision: EC200TCNDAR01A01M1G

OK

2.18. ATS3   Set Command Line Termination Character

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

ATS3 Set Command Line Termination Character	
Read Command **ATS3?**	Response **<n>** **OK**
Write Command **ATS3=<n>**	Response This parameter setting determines the character recognized by TA to terminate an incoming command line. The TA also returns this character in output. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	0-13-127	Command line termination character (Default 13=**<CR>**)

2.19. ATS4   Set Response Formatting Character

The 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 This parameter setting determines the character generated by the TA for result code and information text. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	0-10-127	Response formatting character (Default 10=**<LF>**)

2.20. ATS5   Set Command Line Editing Character

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

ATS5 Set Command Line Editing Character	
Read Command **ATS5?**	Response **<n>** **OK**
Write Command **ATS5=<n>**	Response This parameter setting determines the character recognized by TA as a request to delete the immediately preceding character from the command line. **OK**
Maximum Response Time	300ms

Reference	
V.25ter	

Parameter

\<n>	0-8-127	Command line editing character (Default 8=**\<Backspace>**)

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

The command determines whether or not the module transmits particular result codes to the TE. It also controls whether or not the module verifies the presence of a dial tone when it begins dialing, and whether or not engaged tone (busy signal) detection is enabled.

ATX Set CONNECT Result Code Format and Monitor Call Progress	
Execution Command **ATX\<value>**	Response This parameter setting determines whether or not the TA detected the presence of dial tone and busy signal and whether or not TA transmits particular result codes. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

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

2.22. AT+CFUN   Set Phone Functionality

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

AT+CFUN Set Phone Functionality	
Test Command **AT+CFUN=?**	Response **+CFUN:** (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	15s, determined by network.
Reference 3GPP TS 27.007	

Parameter

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

Example

AT+CFUN=0	//Switch phone 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 ME 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

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

AT+CMEE Error Message Format	
Test Command **AT+CMEE=?**	Response **+CMEE:** (list of supported **<n>**s) **OK**
Read Command **AT+CMEE?**	Response **+CMEE: <n>** **OK**
Write Command **AT+CMEE=<n>**	Response TA disables or enables the use of result code **+CME ERROR:**

	<err> as an indication of an error related to the functionality of the ME. **OK**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

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

2.24. AT+CSCS   Select TE Character Set

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

AT+CSCS Select TE Character Set	
Test Command **AT+CSCS=?**	Response **+CSCS:** (list of supported **<chset>**s) **OK**
Read Command	Response

AT+CSCS?	+CSCS: <chset>
	OK
Write Command	Response
AT+CSCS=<chset>	Set character set **<chset>** which is used by the TE. The TA can then convert character strings correctly between the TE and ME character sets.
	OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<chset>	"GSM"	GSM default alphabet
	"IRA"	International reference alphabet
	"UCS2"	UCS2 alphabet

Example

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

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

OK
```

2.25. AT+QURCCFG   Configure URC Indication Option

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

AT+QURCCFG Configure URC Indication Option	
Test Command	Response
AT+QURCCFG=?	+QURCCFG: "urcport",("usbat","usbmodem","uart1")
	OK

Write Command **AT+QURCCFG="urcport"[,<urcportvalue>]**	If the configuration parameter **<urcportvalue>** is omitted, return current configuration: **+QURCCFG: "urcport",<urcportvalue>** **OK** If the configuration parameter **<urcportvalue>** is not omitted, response: **OK** **ERROR**
Maximum Response Time	300ms

Parameter

<urcportvalue>	Set URC output port	
	"usbat"	USB AT port
	"usbmodem"	USB modem port
	"uart1"	Main UART

NOTES

1. Configuration of URC output port will be saved to NV immediately by default.
2. After URC output port is set successfully, it will take effect immediately.

Example

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

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

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

OK
```

3 Serial Interface Control Commands

3.1. AT&C   Set DCD Function Mode

The 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 This parameter determines how the state of circuit (DCD) relates to the detection of received line signal from the distant end. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<value>	0	DCD function is always ON
	<u>1</u>	DCD function is ON only in the presence of data carrier

3.2. AT&D   Set DTR Function Mode

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

AT&D Set DTR Function Mode	
Execution Command **AT&D[<value>]**	Response This parameter determines how the TA responds when circuit (DTR) is changed from low to high level during data mode. **OK**
Maximum Response Time	300ms
Reference	

V.25ter	

Parameter

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

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

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

AT+IFC Set TE-TA Local Data Flow Control	
Test Command **AT+IFC=?**	Response **+IFC:** (list of supported **<dce_by_dte>**s),(list of supported **<dte_by_dce>**s) **OK**
Read Command **AT+IFC?**	Response **+IFC: <dce_by_dte>,<dte_by_dce>** **OK**
Write Command **AT+IFC=<dce_by_dte>,<dte_by_dce>**	Response This parameter setting determines the data flow control on the serial interface for data mode. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<dce_by_dte>	Specifies the method that will be used by TE when receiving data from TA	
	0	None
	2	RTS flow control
<dte_by_dce>	Specifies the method that will be used by TA when receiving data from TE	
	0	None
	2	CTS flow control

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

Example

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

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

The command is used to query and set the baud rate of the UART. The default baud rate value (**<rate>**) is 115200bps. The setting of **<rate>** will not be restored with **AT&F**.

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 This parameter setting determines the data rate of the TA on the serial interface. After the delivery of any result code associated with the current command line, the rate of command takes effect. **OK**
Maximum Response Time	300ms
Reference V.25ter	

Parameter

\<rate\>	Baud rate per second. Unit: bps.
	4800
	9600
	19200
	38400
	57600
	115200
	230400
	460800
	921600

NOTES

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**, **ATZ** and **AT&W**.
3. 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 115200bps
OK	
AT&W	//Store current setting, that is, the serial communication speed is 115200bps after restarting module
OK	
AT+IPR?	
+IPR: 115200	
OK	
AT+IPR=115200;&W	//Set fixed baud rate to 115200bps and store current setting
OK	

4 Status Control Commands

4.1. AT+CPAS Query Mobile Activity Status

The Execution Command queries the module's activity status.

AT+CPAS Query Mobile 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** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<pas>		
	<u>0</u>	Ready
	2	Unknown
	3	Ringing
	4	Call in progress or call hold*

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
```

NOTE

"*" means call function is under development.

4.2. AT+CEER   Report Extended Error

The command is used to query an extended error and report the cause of the last failed operation, such as:

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

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

AT+CEER Report Extended Error	
Test command	Response
AT+CEER=?	**OK**

Execution command **AT+CEER**	Response **+CEER: <text>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<text>	Release cause text. Reason for the last call failure to setup or release (listed in ***Chapter 11.9***). 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.

4.3. AT+QCFG   Configure Extended Settings

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

AT+QCFG Configure Extended Settings	
Test Command **AT+QCFG=?**	Response **+QCFG: "gprsattach",**(list of supported **<attachmode>**s) **+QCFG: "nwscanmode",**(list of supported **<scanmode>**s)**,** (list of supported **<effect>**s) **+QCFG: "nwscanseq",**(list of supported **<scanseq>**s)**,** (list of supported **<effect>**s) **+QCFG: "servicedomain",**(list of supported **<service>**s)**,** (list of supported **<effect>**s) **+QCFG: "roamservice",**(list of supported **<roammode>**s)**,** (list of supported **<effect>**s) **+QCFG: "band",**(list of supported **<bandval>**s)**,**(list of supported **<ltebandval>**s)**,**(list of supported **<effect>**s) **+QCFG: "urcdelay",**(list of supported **<value>**s) **+QCFG: "urc/cache",**(list of supported **<value>**s) **+QCFG: "urc/ri/other",**(list of supported **<typeri>**s)**,**(list of supported **<pulseduration>**s)
Maximum Response Time	300ms

Reference	

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

The command specifies the mode to attach GPRS when UE is powered on. The configuration will take effect immediately.

AT+QCFG="gprsattach"　Configure GPRS Attach Mode	
Write Command **AT+QCFG="gprsattach"[,<attachmode>]**	Response If **<attachmode>** is omitted, return current configuration: **+QCFG: "gprsattach",<attachmode>** **OK** If the configuration parameter **<attachmode>** is not omitted, configure the GPRS attach mode: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<attachmode>	Number format. The mode to attach GRPS when UE is powered on. 0　　Manual attach 1　　Auto attach

---

NOTE

This configuration will affect the supported network mode of the module. For example, when setting **<attachmode>**=0, LTE mode will be removed if the current network mode includes it, but the mode will be restored when setting **<attachmode>**=1.

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

The command specifies the network mode to be searched. And the configuration will take effect immediately.

AT+QCFG="nwscanmode" Configure Network Search Mode	
Write Command AT+QCFG="nwscanmode"[,<scanmode>]	Response If <scanmode> is omitted, return the current configuration: **+QCFG: "nwscanmode",<scanmode>** **OK** If <scanmode> is not omitted, set the network mode to be searched: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<scanmode>	Number format. Network searching mode.	
	0	Automatic (LTE/WCDMA/GSM)
	1	GSM only
	2	WCDMA only
	3	LTE only

NOTE

If the mode conflicts with the current configuration, an error will be returned. For example, if the module is currently configured as CS only when LTE is set only, it will return an error.

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

The command specifies the sequence of searching network.

AT+QCFG="nwscanseq" Configure Network Searching Sequence	
Write Command AT+QCFG="nwscanseq"[,<scanseq>]	Response If <scanseq> is omitted, return current configuration: **+QCFG: "nwscanseq",<scanseq>** **OK** If <scanseq> is omitted, specify the network searching sequence:

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

Parameter

<scanseq>	Number format. Network searching sequence.
	0 Automatic (LTE/WCDMA/GSM)
	1 GSM only
	2 WCDMA only
	3 LTE only
	4 GSM/WCDMA/LTE
	5 WCDMA/GSM /LTE
	6 LTE/WCDMA
	7 LTE/GSM
	8 WCDMA/LTE
	9 WCDMA/GSM
	10 GSM/LTE
	11 GSM/WCDMA

NOTES

1. If the mode is changed, the configuration will take effect immediately. Otherwise, it take effect only after the module is restarted.
2. If the mode conflicts with the current configuration, an error will be returned. For example, if the module is currently configured as CS only when LTE is set only, it will return an error.

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

The command is used to enable or disable the roam service. And the configuration will take effect immediately.

AT+QCFG="roamservice" Configure Roam Service	
Write Command	Response
AT+QCFG="roamservice"[,<roammode>]	If **<roammode>** is omitted, return the current configuration:
	+QCFG: "roamservice",<roammode>
	OK

	If **\<roammode\>** is not omitted, configure the mode of roam service : **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err\>**
Maximum Response Time	300ms

Parameter

\<roammode\>	Number format. The mode of roam service. 1 Disable roam service 2 Enable roam service <u>255</u> Automatic

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

The command specifies the registered service domain. The configuration will take effect immediately.

AT+QCFG="servicedomain" Configure Service Domain	
Write Command **AT+QCFG="servicedomain"[,\<service\>]**	Response If **\<service\>** is omitted, return the current configuration: **+QCFG: "servicedomain",\<service\>** **OK** If **\<service\>** is not omitted, configure the service domain of UE: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err\>**
Maximum Response Time	300ms

Parameter

\<service\>	Service domain of UE 0 CS only

1	PS only
2	CS & PS

> **NOTE**
>
> This configuration will affect the supported network mode of the module. For example, when setting module as CS, LTE mode will be removed if the current network mode includes it, but the mode will be restored when setting PS only or both CS&PS.

4.3.6. AT+QCFG="band" Configure Band

The command specifies the preferred frequency bands to be searched of UE. The configuration will take effect immediately.

AT+QCFG="band" Configure Band	
Write Command **AT+QCFG="band"[,\<bandval\>,\<ltebandval\>]**	Response If configuration parameters are omitted (that is, only execute **AT+QCFG="band"**), return current configuration: **+QCFG: "band",\<bandval\>,\<ltebandval\>** **OK** If configuration parameters are all entered, configure the preferred frequency bands to be searched: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err\>**
Maximum Response Time	300ms

Parameter

\<bandval\>	A hexadecimal value that specifies the GSM and WCDMA frequency band. If it is set to 0, it means not to change GSM and WCDMA frequency band. (e.g.: 00000013=00000001(GSM900)+00000002(GSM1800)+00000010(WCDMA 2100))
	00000000 No change
	00000001 GSM900
	00000002 GSM1800
	00000010 WCDMA 2100
	00000040 WCDMA 850

	00000080 WCDMA 900
	0000FFFF Any frequency band
<ltebandval>	A hexadecimal value that specifies the LTE frequency band. If it is set to 0 or 0x40000000, it means not to change LTE frequency band. (e.g.: 0x15=0x1(LTE B1)+0x4(LTE B3)+0x10(LTE B5))

0x1 (CM_BAND_PREF_LTE_EUTRAN_BAND1)	LTE B1
0x4 (CM_BAND_PREF_LTE_EUTRAN_BAND3)	LTE B3
0x10 (CM_BAND_PREF_LTE_EUTRAN_BAND5)	LTE B5
0x80 (CM_BAND_PREF_LTE_EUTRAN_BAND8)	LTE B8
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
0x7FFFFFFFFFFFFFFF(CM_BAND_PREF_ANY)	Any frequency band

NOTE

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

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

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

AT+QCFG="urc/ri/other" Specify RI Behavior When Other URCs are Presented	
Write Command **AT+QCFG="urc/ri/other"[,<typeri>[,<pulseduration>]]**	Response If **<typeri>** and **<pulseduration>** are omitted, return the current configuration: **+QCFG: "urc/ri/other",<typeri>,<pulseduration>,<pulsecount>** **OK** If **<typeri>** and **<pulseduration>** are not omitted, set the RI behavior when other URCs are presented: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**

Maximum Response Time	300ms

Parameter

\<typeri\>	RI behavior when URCs are presented
	"off" No change. Ring indicator keeps inactive.
	"pulse" Pulse. Pulse width determined by **\<pulseduration\>**.
\<pulseduration\>	The width of pulse. The value ranges from 1 to 2000ms and the default is 120ms. This parameter is effect only when **\<typeri\>** is "pulse".
\<pulsecount\>	The count of pulse. This parameter is only meaningful when **\<typeri\>** is "pulse". The value ranges from 1 to 5 and the default is 1. The interval time between two pulses is equal to **\<pulseduration\>**.

4.3.8. AT+QCFG="urcdelay"　Set Delay Time Of URC Indication

The command can set the delay time of URC indication from the time that ring indicator pulse starts.

AT+QCFG="urcdelay"　Delay URC Indication	
Write Command **AT+QCFG="urcdelay"[,\<time\>]**	Response If **\<time\>** is omitted, return the current configuration : **+QCFG: "urcdelay",\<time\>** **OK** If **\<time\>** is not omitted, set when the URC indication will be outputted: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err\>**
Maximum Response Time	300ms

Parameter

\<time\>	Set the delay time of URC indication when ring indicator pulse starts. The value ranges from 0 to 120ms and the default is 0, which means no delay.

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

AT+QCFG="urc/cache"　Enable/Disable URC Cache Function	
Write Command **AT+QCFG="urc/cache",<enable>**	Response If **<enable>** is omitted, return the current configuration: **+QCFG: "urc/cache",<enable>** **OK** If **<enable>** is not omitted, enable/disable URC cache function: **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<enable>	0	Disable URC cache
	1	Enable URC cache

NOTE

The configuration of the command will take effect immediately and will be saved after power-off.

Example

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

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

OK

                           //Make a call and send two messages to the module
```

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

RING                          //Output cached URC

NO CARRIER                    //Output cached URC

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

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

OK
```

4.4. AT+QINDCFG   Control URC Indication

The command is used to control URC indication.

AT+QINDCFG Control URC Indication	
Test command **AT+QINDCFG=?**	Response **+QINDCFG: "all",(0,1),(0,1)** **+QINDCFG: "csq",(0,1),(0,1)** **+QINDCFG: "datastatus",(0,1),(0,1)** **+QINDCFG: "mode",(0,1),(0,1)** **+QINDCFG: "smsfull",(0,1),(0,1)** **+QINDCFG: "smsincoming",(0,1),(0,1)** **+QINDCFG: "act",(0,1),(0,1)** **OK**
Write command **AT+QINDCFG=<urctype>[,<enable>[,<savetonvram>]]**	Response If **<enable>** and **<savetonvram>** are omitted, the current configuration will be returned: **+QINDCFG: <urctype>,<enable>** **OK** If **<enable>** and **<savetonvram>** are not omitted, set the URC indication configurations: **OK** **ERROR**

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

Parameter

<urctype>	URC type	
	"all"	Main switch of all URCs. Default is ON.
	"csq"	Indication of signal strength and channel bit error rate change (similar to **AT+CSQ**). Default is OFF. If this configuration is ON, present: **+QIND: "csq",<rssi>,<ber>**
	"datastatus"	Indication of data service status. Default is OFF. If this configuration is ON, present: **+QIND: "datastatus",<suspended>,<reason>** **<reason>** is number format as below: 0 : SUSPEND_NO_CAUSE 1: SUSPEND_BY_RAU_ATTACH 2: SUSPEND_BY_LAU 3: SUSPEND_BY_TAU 4: SUSPEND_BY_CS_SERVICE 5: SUSPEND_BY_DS_OPERATION 6: SUSPEND_BY_POWERUP
	"smsfull"	SMS storage full indication. Default is OFF. If this configuration is ON, present: **+QIND: "smsfull",<storage>**
	"smsincoming"	Incoming message indication. Default is ON. Related URC list: **+CMTI**, **+CMT**, **+CDS**
	"act"	Indication of network access technology change. Default is OFF. If this configuration is ON, present: **+QIND: "act",<actvalue>** **<actvalue>** is string format. The values are as below: "GSM" "EGPRS" "WCDMA" "HSDPA" "HSUPA" "HSDPA&HSUPA" "LTE" "UNKNOWN" The examples of URC are as below:

		+QIND: "act","HSDPA&HSUPA"
		+QIND: "act","UNKNOWN"
		The description of "act" is as below:
		1. If module does not register on network, **<actvalue>** would be "UNKNOWN".
		2. If this configuration is ON, the URC of "act" will be reported immediately. Only when the network access technology changes, a new URC will be reported.
<enable>	URC indication is ON or OFF	
	0	OFF
	1	ON
<savetonvram>	Whether to save configuration into NV. Not saved by default.	
	<u>0</u>	Not save
	1	Save

5 (U)SIM Related Commands

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

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

AT+CIMI Request International Mobile Subscriber Identity (IMSI)	
Test Command **AT+CIMI=?**	Response **OK**
Execution Command **AT+CIMI**	Response 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	300ms
Reference 3GPP TS 27.007	

Parameter

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

Example

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

OK

5.2. AT+CLCK　Facility Lock

The command is used to lock, unlock or interrogate a MT or a network facility **<fac>**. It can be aborted when network facilities are being set or interrogated. The factory default password of PF, PN, PU, PP and PC lock is "12341234".

AT+CLCK　Facility Lock	
Test Command **AT+CLCK=?**	Response **+CLCK:** (list of supported **<fac>**s) **OK**
Write Command **AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]**	Response This command is used to lock, unlock or interrogate the ME or network facility **<fac>**. Password is normally needed to do such actions. When querying the status of network service (**<mode>**=2) the response line for 'not active' case (**<status>**=0) should be returned only if service is not active for any **<class>**. 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	5s
Reference 3GPP TS 27.007	

Parameter

<fac>	"SC"	(U)SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued).
	"AO"	BAOC (Bar All Outgoing Calls) (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***).
	"AI"	BAIC (Bar All Incoming Calls) (refer to *3GPP TS 22.088 **clause 2***).

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

The command is used to enter a password or query whether or not the module requires a password which is necessary before it can be operated. The password may be (U)SIM PIN, (U)SIM PUK, PH-SIM PIN, etc.

AT+CPIN Enter PIN	
Test Command **AT+CPIN=?**	Response **OK**
Read Command **AT+CPIN?**	Response TA returns an alphanumeric string indicating whether or not some password is required. **+CPIN: <code>** **OK**
Write Command **AT+CPIN=<pin>[,<newpin>]**	Response 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 **<newpin>** is used to replace the old pin in the (U)SIM. **OK**
Maximum Response Time	5s
Reference 3GPP TS 27.007	

Parameter

<code>	READY	MT is not pending for any password
	SIM PIN	MT is waiting for (U)SIM PIN to be given
	SIM PUK	MT is waiting for (U)SIM PUK to be given
	SIM PIN2	MT is waiting for (U)SIM PIN2 to be given
	SIM PUK2	MT is waiting for SIM PUK2 to be given
	PH-NET PIN	MT is waiting for network personalization password to be given
	PH-NET PUK	MT is waiting for network personalization unblocking password

		to be given
	PH-NETSUB PIN	MT is waiting for network subset personalization password to be given
	PH-NETSUB PUK	MT is waiting for network subset personalization unblocking password to be given
	PH-SP PIN	MT is waiting for service provider personalization password to be given
	PH-SP PUK	MT is waiting for service provider personalization unblocking password to be given
	PH-CORP PIN	MT is waiting for corporate personalization password to be given
	PH-CORP PUK	MT is waiting for corporate personalization unblocking password to be given
<pin>		String type. Password. If the requested password was a PUK, such as (U)SIM PUK1, PH-FSIM PUK or another passwords, then **<pin>** must be followed by **<newpin>**.
<newpin>		String type. New password required if the requested code was a PUK.

Example

```
//Enter PIN

AT+CPIN?
+CPIN: SIM PIN                      //Queried 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                      //Queried PUK code is locked

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

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

OK

5.4. AT+CPWD   Change Password

The command sets a new password for the facility lock function defined by **AT+CLCK**.

AT+CPWD Change Password	
Test Command **AT+CPWD=?**	Response TA returns a list of pairs which present the available facilities and the maximum length of their password. **+CPWD:** (list of supported **<fac>**s),(**<pwdlength>**s) **OK**
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response TA sets a new password for the facility lock function. **OK**
Maximum Response Time	5s
Reference 3GPP TS 27.007	

Parameter

<fac>	"SC"	(U)SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command is issued)
	"AO"	BAOC (Bar All Outgoing Calls, 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***)
	"AI"	BAIC (Bar All Incoming Calls, refer to *3GPP TS 22.088 **clause 2***)
	"IR"	BIC-Roam (Bar Incoming Calls when Roaming outside the home country, refer to *3GPP TS 22.088 **clause 2***)
	"AB"	All barring services (refer to *3GPP TS 22.030*, applicable only for **<mode>**=0)
	"AG"	All outgoing barring services (refer to *3GPP TS 22.030*, applicable only for **<mode>**=0)
	"AC	All incoming barring services (refer to *3GPP TS 22.030*, applicable only for **<mode>**=0)
	"P2"	(U)SIM PIN2
<pwdlength>		Integer type. Maximum length of password.
<oldpwd>		Password specified for the facility from the user interface or with command.

<newpwd>   New password

Example

```
AT+CPIN?
+CPIN: READY

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

//Restart module or re-activate the SIM card

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

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

+CPIN: READY
```

5.5. AT+CSIM   Generic (U)SIM Access

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

AT+CSIM Generic (U)SIM Access	
Test Command **AT+CSIM=?**	Response **OK**
Write Command **AT+CSIM=<length>,<command>**	Response **+CSIM: <length>,<response>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
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*.

5.6. AT+CRSM   Restricted (U)SIM Access

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

Parameter

\<command>	(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 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.

5.7. AT+QCCID   Show ICCID

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

AT+QCCID Show ICCID	
Test Command **AT+QCCID=?**	Response **OK**
Execution Command **AT+QCCID**	Response **+QCCID: <iccid>** **OK** **ERROR**
Maximum Response Time	300ms

Parameter

<iccid>   ICCID (Integrated Circuit Card Identifier) number of the (U)SIM card

Example

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

5.8. AT+QPINC   Display PIN Remainder Counter

The command can query the number of attempts left to enter the password of (U)SIM PIN/PUK.

AT+ QPINC Display PIN Remainder Counter	
Test Command **AT+QPINC=?**	Response **+QPINC: ("SC","P2")** **OK**
Read Command **AT+QPINC?**	Response **+QPINC: "SC",\<pincounter>,\<pukcounter>** **+QPINC: "P2",\<pincounter>,\<pukcounter>** **OK**
Write Command **AT+QPINC=\<facility>**	Response **+QPINC: \<facility>,\<pincounter>,\<pukcounter>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err>**
Maximum Response Time	300ms

Parameter

\<facility>	"SC"	(U)SIM PIN
	"P2"	(U)SIM PIN2
\<pincounter>	Number of attempts left to enter the password of PIN	
\<pukcounter>	Number of attempts left to enter the password of PUK	

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

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

AT+QINISTAT Query Initialization Status of (U)SIM Card	
Test Command **AT+QINISTAT=?**	Response **+QINISTAT: (0-7)** **OK**
Execution Command **AT+QINISTAT**	Response **+QINISTAT: <status>** **OK**
Maximum Response Time	300ms

Parameter

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

5.10. AT+QSIMDET   (U)SIM Card Detection

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

AT+ QSIMDET (U)SIM Card Detection	
Test Command **AT+QSIMDET=?**	Response **+QSIMDET: (0,1),(0,1)** **OK**
Read Command **AT+QSIMDET?**	Response **+QSIMDET: <enable>,<insertlevel>** **OK**
Write Command	Response

AT+QSIMDET=<enable>,<insertlevel>	OK
	ERROR
Maximum Response Time	300ms

Parameter

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

NOTES

1. Hot-swap function is invalid if the configured value of **<insertlevel>** is inconsistent with hardware design.
2. Hot-swap function takes effect after the module is restarted.

Example

AT+QSIMDET=1,0	//Set (U)SIM card detection pin level as low when (U)SIM card is inserted
OK	
<Remove (U)SIM card>	
+CPIN: NOT READY	
<Insert (U)SIM card>	
+CPIN: READY	//If PIN1 of the (U)SIM card is unlocked

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

The command queries (U)SIM card insertion status or determines whether (U)SIM card insertion status report is enabled. The configuration of this command can be saved by **AT&W**.

AT+ QSIMSTAT (U)SIM Card Insertion Status Report	
Test Command	Response
AT+QSIMSTAT=?	**+QSIMSTAT: (0,1)**
	OK

Read Command	Response
AT+QSIMSTAT?	**+QSIMSTAT: <enable>,<insertedstatus>**
	OK
Write Command	Response
AT+QSIMSTAT=<enable>	**OK**
	ERROR
Maximum Response Time	300ms

Parameter

<enable>	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>,<insertedstatus>** will be reported.
	<u>0</u> Disable
	1 Enable
<insertedstatus>	(U)SIM card is inserted or removed. This parameter is not allowed to be set.
	0 Removed
	1 Inserted
	2 Unknown, before (U)SIM initialization

Example

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

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

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

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

OK
```

<Insert (U)SIM card>

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

+CPIN: READY

6 Network Service Commands

6.1. AT+COPS   Operator Selection

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

AT+COPS Operator Selection	
Test Command **AT+COPS=?**	Response TA 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. **+COPS:** (list of supported **<stat>,**long alphanumeric **<oper>,** short alphanumeric **<oper>,**numeric **<oper>**s)**[,<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 TA returns the current mode and the currently selected operator. If no operator is selected, **<format>**, **<oper>** and **<Act>** are omitted. **+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>[,<Act>]]]**	Response TA forces an attempt to select and register the GSM/UMTS network operator. If the selected operator is not available, no

	other operator shall be selected (except **<mode>**=4). The format of selected operator name shall apply to further Read Command (**AT+COPS?**). **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	180s, determined by network.
Reference 3GPP TS 27.007	

Parameter

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

Example

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

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

OK

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

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

OK

6.2. AT+CREG   Network Registration Status

The Read Command returns the network registration status. The Write Command sets whether or not to present URC.

AT+CREG Network Registration Status	
Test Command **AT+CREG=?**	Response **+CREG:** (list of supported **<n>**s) **OK**
Read Command **AT+CREG?**	Response TA 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. **+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 TA controls the presentation of an unsolicited result code **+CREG: <stat>** when **<n>**=1 and there is a change in the ME network registration status. **OK**
Maximum Response Time	300ms

Reference	
3GPP TS 27.007	

Parameter

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

Example

AT+CREG=1	
OK	
+CREG: 1	//URC reports that ME has registered on network
AT+CREG=2	//Activate extended URC mode
OK	
+CREG: 1,"D509","80D413D",7	//URC reports that operator has found location area code and cell ID

6.3. AT+CSQ   Signal Quality Report

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

AT+CSQ Signal Quality Report	
Test Command **AT+CSQ=?**	Response The Test Command returns values supported by the TA. **+CSQ:** (list of supported **<rssi>**s),(list of supported **<ber>**s) **OK**
Execution Command **AT+CSQ**	Response The Execution Command returns received signal strength indication **<rssi>** and channel bit error rate **<ber>** from the ME. **+CSQ: <rssi>,<ber>** **OK** **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<rssi>	0	-113dBm or less
	1	-111dBm
	2...30	-109dBm... -53dBm
	31	-51dBm or greater
	99	Not known or not detectable
	100	-116dBm or less
	101	-115dBm
	102...190	-114dBm...-26dBm
	191	-25dBm or greater
	199	Not known or not detectable
	100~199	Extended to be used in TD-SCDMA indicating received signal code power (RSCP)
<ber>	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 channel bit error rate is 99
OK

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

6.4. AT+CPOL   Preferred Operator List

The 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>]** **<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** **ERROR**

	If the **\<index\>** is given but the **\<operator\>** is left out, the entry is deleted.
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

\<index\>	Integer type. The order number of operator in the (U)SIM preferred operator list	
\<format\>	0	Long format alphanumeric **\<oper\>**
	1	Short format alphanumeric **\<oper\>**
	2	Numeric **\<oper\>**
\<oper\>	String type. **\<format\>** indicates the format is alphanumeric or numeric (see **AT+COPS**)	
\<GSM\>	GSM access technology	
	0	Access technology is not selected
	1	Access technology is selected
\<GSM_compact\>	GSM compact access technology	
	0	Access technology is not selected
	1	Access technology is selected
\<UTRAN\>	UTRAN access technology	
	0	Access technology is not selected
	1	Access technology is selected
\<E-UTRAN\>	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 SIM cards or UICC's containing PLMN selector with access technology.

6.5. AT+COPN Read Operator Names

The 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** **+CME ERROR: <err>**
Maximum Response Time	Depends on the number of operator names.
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**)

6.6. AT+CTZU Automatic Time Zone Update

AT+CTZU Automatic Time Zone Update	
Test Command **AT+CTZU=?**	Response **+CTZU: (0,1,3)** **OK**
Write Command **AT+CTZU=<onoff>**	Response **OK** **ERROR**
Read Command **AT+CTZU?**	Response **+CTZU: <onoff>**

	OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<onoff>	Integer type. The mode of automatic time zone update.	
	0	Disable automatic time zone update via NITZ.
	1	Enable automatic time zone update via NITZ and update GMT time to URC
	3	Enable automatic time zone update via NITZ and update LOCAL time to RTC

Example

```
AT+CTZU?
+CTZU: 1

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

OK
AT+CTZU=0
OK
AT+CTZU?
+CTZU: 1

OK
```

6.7. AT+CTZR   Time Zone Reporting

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

AT+CTZR Time Zone Reporting	
Test Command **AT+CTZR=?**	Response **+CTZR: (0-2)** **OK**

Write Command	Response
AT+CTZR=<reporting>	**OK**
	ERROR
Read Command	Response
AT+CTZR?	**+CTZR: <reporting>**
	OK
Maximum Response Time	300ms
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 unsolicited result code:
	+CTZV: <tz>
	2 Enable extended time zone reporting by unsolicited result code:
	+CTZE: <tz>,<dst>,<time>
<tz>	String type. The sum of the local time zone (difference between the local time and GMT is expressed in quarters of an hour) plus daylight saving time. The format is "±zz", expressed as a fixed width, two-digit integer with the range -48 ... +56. To maintain a fixed width, numbers in the range -9 ... +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"   //**<reporting>** is 2

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

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

AT+QLTS Obtain the Latest Time Synchronized Through Network	
Test Command **AT+QLTS=?**	Response **+QLTS:** list of supported **<mode>**s **OK**
Execution Command **AT+QLTS**	Response The Execution Command returns the latest time that has been synchronized through network: **+QLTS: <time>,<dst>** **OK**
Write Command **AT+QLTS=<mode>**	Response **+QLTS: <time>,<dst>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

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

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

Example

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

OK
AT+QLTS                //Query the latest time synchronized through network
+QLTS: "2019/01/13,03:40:48+32,0"
OK
AT+QLTS=0              //Query the latest time synchronized through network. It offers the same
                         function as Execution Command AT+QLTS.
+QLTS: "2019/01/13,03:40:48+32,0"

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

OK
AT+QLTS=2              //Query the current LOCAL time calculated from the latest time that has been
                         synchronized through network
+QLTS: "2019/01/13,11:41:23+32,0"

OK
```

6.9. AT+QNWINFO   Query Network Information

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

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	300ms

Parameter

<Act>	String type. The access technology selected
	"NONE"
	"GSM"
	"GPRS"
	"EDGE"
	"WCDMA"
	"HSDPA"
	"HSUPA"
	"HSPA+"
	"TDD LTE"
	"FDD LTE"
<oper>	String type. The operator in numeric format
<band>	String type. The band selected
	"GSM 1800"
	"GSM 900"
	"WCDMA 2100"
	"WCDMA 850"
	"WCDMA 900"
<channel>	Integer type. Channel ID

Example

AT+QNWINFO=?
OK
AT+QNWINFO
+QNWINFO: "FDD LTE",46001,"LTE BAND 3",1650

OK

7 Phonebook Commands

7.1. AT+CNUM   Subscriber Number

The command can get 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** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP 27.007	

Parameter

<alpha>	Optional alphanumeric string associated with **<number>**. The used character set should be the one selected with **AT+CSCS** command
<number>	String type phone number of 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

7.2. AT+CPBF   Find Phonebook Entries

The command can search 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** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	Depends on the storage of phonebook entries.
Reference 3GPP 27.007	

Parameter

<nlength>	Integer type. Indicates the maximum length of field **<number>**.
<tlength>	Integer type. Indicates the maximum length of field **<text>**.
<findtext>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.
<index>	Integer type values in the range of location numbers of phone book memory.
<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
<text>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.

7.3. AT+CPBR   Read Phonebook Entries

The command can return 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** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	Depends on the storage of phonebook entries.
Reference 3GPP 27.007	

Parameter

<index>	Integer type value in the range of location numbers of phone book memory.
<nlength>	Integer type. Indicates the maximum length of field **<number>**.
<tlength>	Integer type. Indicates the maximum length of field **<text>**.
<index1>	The first phone book record to read
<index2>	The last phonebook record to read
<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
<text>	String type field of maximum length **<tlength>** in current TE character set specified by **AT+CSCS**.

7.4. AT+CPBS   Select Phonebook Memory Storage

The 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** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Read Command **AT+CPBS?**	Response **+CPBS: <storage>,<used>,<total>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Write Command **AT+CPBS=<storage>**	Response **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP 27.007	

Parameter

<storage>	"SM"	(U)SIM phonebook
	"DC"	ME dialed calls list (**AT+CPBW** may not be applicable to this storage)
	"FD"	(U)SIM fix dialing-phone book (**AT+CPBW** operation need the authority of PIN2)
	"LD"	(U)SIM last-dialing-phone book (**AT+CPBW** may not be applicable to this storage)
	"EN"	(U)SIM (or ME) emergency number (**AT+CPBW** may not be applicable to this storage)

"ON"	(U)SIM own numbers (MSISDNs) list
"AP"	Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DFPHONEBOOK under ADFUSIM is selected.
"SDN"	Service Dialling Number
\<used>	Integer type. Indicates the total number of used locations in selected memory
\<total>	Integer type. Indicates the total number of locations in selected memory

7.5. AT+CPBW   Write Phonebook Entry

The 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:** (The range of supported **\<index>**s), **\<nlength>,** (list of supported **\<type>**s), **\<tlength>** **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err>**
Write Command **AT+CPBW=[\<index>][,\<number>[,\<type>[,\<text>]]]**	Response **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: \<err>**
Maximum Response Time	300ms
Reference 3GPP 27.007	

Parameter

\<index>	Integer type value in the range of location numbers of phone book memory. If **\<index>** is not given, the first free entry will be used. If **\<index>** is given as the only parameter, the phonebook entry specified by **\<location>** is deleted.
\<nlength>	Integer type. Indicates the maximum length of field **\<number>**.
\<tlength>	Integer type. Indicates the maximum length of field **\<text>**.
\<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

\<text\>   String type field of maximum length **\<tlength\>** in current TE character set specified by
AT+CSCS.

Example

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

8 Short Message Service Commands

8.1. AT+CSMS   Select Message Service

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

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

Parameter

<service>	Type of message service	
	<u>0</u>	*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>	Mobile terminated messages		
	0	Type not supported	
	<u>1</u>	Type supported	
<mo>	Mobile originated messages		
	0	Type not supported	
	<u>1</u>	Type supported	
<bm>	Broadcast type messages		
	0	Type not supported	
	<u>1</u>	Type supported	

Example

AT+CSMS=?	//Test command
+CSMS: (0,1)	
OK	
AT+CSMS=1	//Set type of message service as 1
+CSMS: 1,1,1	
OK	
AT+CSMS?	//Read command
+CSMS: 1,1,1,1	
OK	

8.2. AT+CMGF   Message Format

The 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	300ms
Reference 3GPP TS 27.005	

Parameter

<mode>	<u>0</u> 1	PDU mode Text mode

8.3. AT+CSCA   Service Center Address

The 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: **+CME ERROR: <err>**
Maximum Response Time	300ms
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 (refer to **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 (default refer to **\<toda\>**).

Example

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

8.4. AT+CPMS   Preferred Message Storage

The 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 TA selects memory storages **\<mem1\>**, **\<mem2\>** and **\<mem3\>** to be used for reading, writing, etc. **+CPMS:** **\<used1\>,\<total1\>,\<used2\>,\<total2\>,\<used3\>,\<total3\>** **OK**

	If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.005	

Parameter

<mem1>	Messages to be read and deleted from this memory storage
	"SM" (U)SIM message storage
	<u>"ME"</u> Mobile equipment message storage
<mem2>	Messages will be written and sent to this memory storage
	"SM" (U)SIM message storage
	<u>"ME"</u> Mobile equipment message storage
<mem3>	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
<usedx>	Integer type. Number of current messages in **<memx>**
<totalx>	Integer type. Total number of messages which can be stored in **<memx>**

Example

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

8.5. AT+CMGD   Delete Message

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

AT+CMGD   Delete Message

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

Parameter

<index>	Integer type value in the range of location numbers supported by the associated memory.	
<delflag>	<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, sent and unsent mobile originated messages from **<mem1>** storage
	4	Delete all messages from **<mem1>** storage
<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

Example

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

8.6. AT+CMGL   List Messages

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

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

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

Parameter

<stat>	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
	In PDU mode:	
	0	Received unread messages
	1	Received read messages
	2	Stored unsent messages
	3	Stored sent messages
	4	All messages
<index>	Integer type value in the range of location numbers supported by the associated memory	
<da>	Destination Address. 3GPP TS 23.040 TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected LTE character set (refer to **AT+CSCS** command 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** command 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** command (see definition of this command in *3GPP TS 27.007*).
<scts>	Service center time stamp. 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer to **<dt>**).
<toda>	Type of recipient address. 3GPP TS 24.011 TP-Recipient-Address Type-of-Address octet in integer format.
<tooa>	Type of originating address. 3GPP TS 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer to **<toda>**).
<length>	Message length. Integer type. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**) the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<data>	In the case of SMS: 3GPP TS 23.040 TP-User-Data in text mode responses; format: - If **<dcs>**, indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used and **<fo>** indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set. - If TE character set other than "HEX" (refer to **AT+CSCS** command in *3GPP TS 27.007*): ME/TA converts GSM alphabet into current TE character set according to rules of *Annex A* in *3GPP TS 27.007*. - If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal number (e.g. character Π (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55)). - If **<dcs>**, indicates that 8-bit or UCS2 data coding scheme is used, or **<fo>** indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). In the case of CBS: 3GPP TS 23.041 CBM Content of Message in text mode responses; format: - If **<dcs>**, indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used: - If TE character set other than "HEX" (refer to **AT+CSCS** command in *3GPP TS27.007*): ME/TA converts GSM alphabet into current TE character set according to rules of *Annex A* in *3GPP TS 27.007*. - If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal number. - If **<dcs>**, indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to

<mem1>	TE as two characters 2A (IRA 50 and 65)) 3GPP TS 27.007.
	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

Example

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

8.7. AT+CMGR   Read Message

The Read 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 TA 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". 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.
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type value in the range of location numbers supported by the associated memory	
<stat>	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
	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** command (see definition of this command in *3GPP TS 27.007*).	
\<da\>	Destination address. 3GPP TS 23.040 TP-Destination-Address Address-Value field in string format. BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to **AT+CSCS** command 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** command 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\>	First octet. Depending on the command or result code: First octet of 3GPP TS 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND in integer format. If a valid value has been entered once, the parameter can be omitted.	
\<pid\>	Protocol identifier. 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).	
\<dcs\>	Data coding scheme. Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.	
\<vp\>	Validity period. Depending on SMS-SUBMIT **\<fo\>** setting: 3GPP TS 23.040 TP-Validity-Period either in integer format or in time-string format (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 default alphabet characters) are converted to characters of the currently selected TE character set (refer to **AT+CSCS** command). 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 recipient address. 3GPP TS 24.011 TP-Recipient-Address Type-of-Address octet in integer format.	
\<tooa\>	Type of originating address.3GPP TS 24.011 TP-Originating-Address Type-of-Address	

	octet in integer format (default 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** 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 (default refer to **<toda>**).
<length>	Message length. Integer type. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**) the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<data>	The text of short message. 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)).
<prt>	Priority
	0 Normal
	1 Interactive
	2 Urgent
	3 Emergency
<fmt>	Format
	0 GSM 7 bit
	1 ASCII
	6 UNICODE
<prv>	Privacy
	0 Normal
	1 Restricted
	2 Confidential
	3 Secret
<lang>	Language
	0 Unspecified
	1 English
	2 French
	3 Spanish
	4 Japanese
	5 Korean
	6 Chinese
	7 Hebrew
<type>	0 Normal
	1 CPT
	2 Voice Mail
	3 SMS Report
<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

Example

+CMTI: "SM",3	//Indicates that new message has been received and saved to **<index>**=3 of "SM"
AT+CSDH=1	
OK	
AT+CMGR=3	//Read message
+CMGR: "REC UNREAD","+8615021012496",,"18/12/15,15:06:37+32",145,4,0,0,"+8613800210500",145,27	
<This is a test from Quectel>	
OK	

8.8. AT+CMGS   Send Message

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

AT+CMGS Send Message	
Test Command **AT+CMGS=?**	Response **OK**
Write Command 1) If text mode (**AT+CMGF=1**): **AT+CMGS=<da>[,<toda>]**<CR> **text is entered** **<Ctrl+Z/ESC>** ESC means quits without sending 2) If PDU mode (**AT+CMGF=0**): **AT+CMGS=<length>**<CR> **PDU is given <Ctrl+Z/ESC>**	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	120s, determined by network.
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** command in *3GPP TS 27.007*). The type of address is given by **<toda>**.
<toda>	Type of recipient address. 3GPP TS 24.011 TP-Recipient-Address Type-of-Address octet in integer format.
<length>	Message length. Integer type. Indicating in the text mode (**AT+CMGF=1**) the length of the message body **<data>** (or **<cdata>**) in characters, or in PDU mode (**AT+CMGF=0**), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).
<mr>	Message reference. 3GPP TS 23.040 TP-Message-Reference in integer format.

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>	//Enter in text. Use **<CTRL+Z>** to send message, or **<ESC>** to quit without sending
+CMGS: 247	
OK	

8.9. AT+CMMS Send More Messages

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

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

Parameter

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

NOTE

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

8.10. AT+CMGW   Write Message to Memory

The 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 "stored 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>** **<ESC>** quits without sending 2) If PDU mode (**AT+CMGF=0**): **AT+CMGW=<length>[,<stat>]**<CR> **PDU is given <Ctrl+Z/ESC>**	Response TA transmits SMS message (either SMS-DELIVER or SMS-SUBMIT) from TE to memory storage **<mem2>**, and then the memory location **<index>** of the stored message is returned. By default the message status will be set to 'stored unsent', but parameter **<stat>** also allows other status values to be given. If writing is successful: **+CMGW: <index>** **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300ms
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** command 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** command in *3GPP TS 27.007*). The type of address given by **<tooa>**.
<tooa>	Type of originating address. 3GPP TS 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer to **<toda>**).

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

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>	//Enter in text. Use **<CTRL+Z>** to write message or **<ESC>** to quit without sending.
+CMGW: 4	
OK	
AT+CMGF=0	//Set SMS message format as PDU mode
OK	
AT+CMGW=18	
> 0051FF00000008000A0500030002016D4B8BD5	
+CMGW: 5	
OK	

8.11. AT+CMSS   Send Message from Storage

The Write Command sends messages with location value **<index>** from message storage **<mem2>** to the network. If a new recipient address **<da>** is given for SMS-SUBMIT, it shall be used instead of the one stored with the message.

AT+CMSS Send Message from Storage	
Test Command **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>[,<toda>]]**	Response TA 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. 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	120s, determined by network.
Reference 3GPP TS 27.005	

Parameter

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

	octet in integer format.
<mr>	Message reference. 3GPP TS 23.040 TP-Message-Reference in integer format.
<scts>	Service center time stamp. 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer to **<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.

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	//Enter in text. Use **<CTRL+Z>** to send message or **<ESC>** to quit without sending.
+CMGW: 4	
OK	
AT+CMSS=4	//Send the message of index 4 from memory storage.
+CMSS: 54	
OK	

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

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

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

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

Parameter

<n>   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

NOTE

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

Example

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

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

+CMT: "+8615021012496",,"18/12/15,17:07:21+32",145,4,0,0,"+8613800551500",145,28
This is a test from Quectel.   //Short message is outputted directly when an SMS is incoming.
AT+CNMA   //Send ACK to the network
OK
AT+CNMA
+CMS ERROR：340   //The second time to return error. It needs ACK only once

8.13. AT+CNMI   SMS Event Reporting Configuration

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

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

Parameter

<mode>	0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.
	1	Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.
	2	Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in data

mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

<mt> The rules for storing received SMS depend on its data coding scheme (refer to *3GPPTS 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, please refer to **AT+CSDH** command) or **^HCMT: <oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>** (text mode for CDMA SMS). Class 2 messages result in indication as defined in **<mt>**=1.

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

<bm> The rules for storing received CBMs depend on its data coding scheme (refer to *3GPP TS 23.038*) and the setting of Select CBM Types (**AT+CSCB**), 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>   <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)

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

<bfr> <u>0</u>   TA buffer of unsolicited result codes defined within this command is flushed to the TE when **<mode>** 1...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...2 is entered.

NOTE

Unsolicited result code:

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

Example

AT+CMGF=1	//Set SMS message format as text mode
OK	
AT+CSCS="GSM"	//Set character set as GSM which is used by the TE
OK	
AT+CNMI=1,2,0,1,0	//Set SMS-DELIVERs are routed directly to the TE
OK	
+CMT: "+8615021012496",,"18/12/15,17:07:21+32",145,4,0,0,"+8613800551500",145,28	
This is a test from Quectel.	//Short message is outputted directly when an SMS is incoming.

8.14. AT+CSCB Select Cell Broadcast Message Types

The Write Command selects which types of CBMs are to be received by the ME. The command writes the parameters in NON-VOLATILE memory.

AT+CSCB Select Cell Broadcast Message Types	
Test Command **AT+CSCB=?**	Response It returns supported modes as a compound value. **+CSCB: (list of supported <mode>s)** **OK**
Read Command **AT+CSCB?**	Response **+CSCB : <mode>,<mids>,<dcss>** **OK**
Write Command **AT+CSCB=<mode>,<mids>[,<dcss>]**	Response TA selects which types of CBMs are to be received by the ME. **OK** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.005	

Parameter

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

8.15. AT+CSDH   Show SMS Text Mode Parameters

The 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** **ERROR**
Maximum Response Time	300ms
Reference 3GPP TS 27.005	

Parameter

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

Example

AT+CSDH=0
OK

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

8.16. AT+CSMP   Set SMS Text Mode Parameters

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

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 SM is received by the SMSC (**<vp>** ranges from 0 to 255) or define the absolute time of the validity period termination (**<vp>** is a string). **OK**
Maximum Response Time	300ms
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

<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.

8.17. AT+QCMGS   Send Concatenated Messages

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

AT+QCMGS Send Concatenated Messages	
Test Command **AT+QCMGS=?**	Response **OK**
Write Command If in text mode (**AT+CMGF=1**): **AT+QCMGS=<da>[,<toda>][,<uid>,<msg_seg>,<msg_total>]**<CR> **text is entered** **<Ctrl+Z/ESC>**	Response If in text mode (**AT+CMGF=1**) and sent successfully: **+QCMGS: <mr>** **OK** **ERROR** If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	120s, determined by network.

Parameter

<uid>	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>	Sequence number of a concatenated message. Range: 0-7. **<msg_seg>**=0 means: ignore the value and regard it as a non-concatenated message.
<msg_total>	The total number of the segments of one concatenated message. Range: 0-7. **<msg_total>**=0 or 1 means: ignore the value and regard it as a

	non-concatenated message.
<da>	Please refer to **AT+CMGS**.
<toda>	Please refer to **AT+CMGS**.
<mr>	Please refer to **AT+CMGS**.

NOTES

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
>ABCD<Ctrl-Z>                      concatenated SMS
+QCMGS: 190

OK

AT+QCMGS="15056913384",120,2,2     //Send the second segment of the concatenated SMS.
>EFGH<Ctrl-Z>
+QCMGS: 191

OK
```

8.18. AT+QCMGR   Read Concatenated Messages

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

AT+QCMGR Read Concatenated Messages	
Test Command **AT+QCMGR=?**	Response **OK**
Write Command **AT+QCMGR=<index>**	Response If in text mode (**AT+CMGF=1**) and command is executed successfully: For SMS-DELIVER: **+QCMGR:** **<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]** **<CR><LF><data>** **OK** For SMS-SUBMIT: **+QCMGR:** **<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>]** **<CR><LF><data>** **OK** For SMS-STATUS-REPORTs: **+QCMGR:** **<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **OK** For SMS-COMMANDs: **+QCMGR:** **<stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]** **OK** Else, If there is any error related to ME functionality: **+CMS ERROR: <err>**
Maximum Response Time	Depends on the length of message content.

Parameter

<uid>	Message identification in the user data header (UDH). Range: 0-65535 (see NOTES). All segments of a same concatenated message have same **<uid>**. Different concatenated messages should have different **<uid>**.
<msg_seg>	Sequence number of a concatenated message. Range: 1-7.
<msg_total>	The total number of the segments of one concatenated message. Range: 2-7.
	Other parameters please refer to **AT+CMGR**

NOTES

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

Example

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

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

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

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

OK
```

9 Packet Domain Commands

9.1. AT+CGATT   Attachment or Detachment of PS

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

AT+CGATT Attachment or Detachment of PS	
Test Command **AT+CGATT=?**	Response **+CGATT:** (list of supported **<state>**s) **OK**
Read Command **AT+CGATT?**	Response **+CGATT: <state>** **OK**
Write Command **AT+CGATT=<state>**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	140s, determined by network.
Reference 3GPP TS 27.007	

Parameter

<state>	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

Example

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

9.2. AT+CGDCONT Define PDP Context

The 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.

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

AT+CGDCONT Define PDP Context	
Test Command **AT+CGDCONT=?**	Response **+CGDCONT:** (range of supported **<cid>**s),**<PDP_type>,** **<APN>,<PDP_addr>,**(list of supported **<data_comp>**s),(list of supported **<head_comp>**s),(list of supported **<IPv4AddrAlloc>**s),(list of supported **<request_type>**s),(list of supported **<P-CSCF_discovery>**s),(list of supported **<IM_CN_Signalling_Flag_Ind>**s) **OK**
Read Command **AT+CGDCONT?**	Response **+CGDCONT:** **<cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>**[…] **OK**
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<data_comp>[,<head_comp>[,<IPv4AddrAlloc>[,<request_type>[,<P-CSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>]]]]]]]]]**	Response **OK** **ERROR**
Maximum Response Time	300ms

Reference	
3GPP TS 27.007	

Parameter

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

           "IP"   Internet Protocol (*IETF STD 5 [103]*)
           "PPP"   Point to Point Protocol (*IETF STD 51 [104]*)
                    Only IP, IPv6 and IPv4v6 values are supported for EPS services.
           "IPV6"   Internet Protocol, version 6
           "IPV4V6" Virtual <PDP_type> introduced to handle dual IP stack UE capability

<APN>	Access point name, a string parameter that is a logical name used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.
<PDP_addr>	A string parameter identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested. The allocated address may be read using the **AT+CGPADDR** command.
<data_comp>	A numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer to *3GPP TS 44.065*).

           <u>0</u>   Off (Default if value is omitted)
           1   On (Manufacturer preferred compression)
           2   V.42bis
           3   V.44 (Not supported currently)

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

           <u>0</u>   Off
           1   On
           2   RFC1144
           3   RFC2507
           4   RFC3095

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

           <u>0</u>   IPv4 address allocated through NAS signalling
           1   IPv4 address allocated through DHCP

<request_type>	Numeric type. Indicate the type of PDP context activation request for the PDP context. Please refer to *3GPP TS 24.301 (**subclause 6.5.1.2**)* and *3GPP TS 24.008 (**subclause 10.5.6.17**)*. If the initial PDP context is supported *(**subclause 10.1.0**)*, it is not allowed to assign **<cid>**=0 for emergency bearer services. According to *3GPP TS 24.008 (**subclause 4.2.4.2.2** and **4.2.5.1.4**)* and *3GPP TS 24.301 (**subclause**

5.2.2.3.3 and *5.2.3.2.2)*, a separate PDP context must be established for emergency bearer services.

<P-CSCF_discovery> Numeric type. Affect how the MT/TA requests to get the P-CSCF address, (refer to *3GPP TS 24.229 [89]* **annex B** and **L**).

    0   Preference of P-CSCF address discovery not affected by **AT+CGDCONT**

    1   Preference of P-CSCF address discovery through NAS signaling

    2   Preference of P-CSCF address discovery through DHCP

<IM_CN_Signalling_Flag_Ind> Numeric type. Indicates to the network whether the PDP context is for IM CN subsystem-related signaling only or not.

    0   UE indicates that the PDP context is not for IM CN subsystem-related signaling only

    1   UE indicates that the PDP context is for IM CN subsystem-related signaling only

---

NOTE

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

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

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

The Write Command specifies a profile for the context **<cid>**. A special form of the Write Command, **AT+CGQREQ=<cid>** causes the requested profile for context number **<cid>** to become undefined. The Read Command returns the current settings for each defined context. Details can be found in *3GPP TS 23.107* and all parameters are saved in NV automatically.

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

	<cid>,<precedence>,<delay>,>reliability>,<peak>,<mean >] [+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean >] […] OK
Write Command **AT+CGQREQ=<cid>[,<precedence>[, <delay>[,<reliability>[,<peak>[,<mean >]]]]]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)
<PDP_type>	Packet Data Protocol type "IP"　　Internet Protocol (*IETF STD 5 [103]*) "PPP"　　Point to Point Protocol (*IETF STD 51 [104]*)　　　　Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6"　　Internet Protocol, version 6 "IPV4V6" Virtual <PDP_type> introduced to handle dual IP stack UE capability
<precedence>	A numeric parameter which specifies the precedence class <u>0</u>　　Network subscribed value 1　　High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3 2　　Normal priority. Service commitments shall be maintained ahead of precedence class 3 3　　Low priority. Service commitments shall be maintained
<delay>	A numeric parameter which specifies the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. For the details, please refer to *Table 4*. <u>0</u>　　Network subscribed value
<reliability>	A numeric parameter which specifies 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>		A numeric parameter which specifies 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>		A numeric parameter which specifies the mean throughput class, in octets per hour.
	<u>0</u>	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

Table 4: Delay Class

SDU Size	Delay Class	Mean Transfer Delay	95 Percentile
128 octets	1 (Predictive)	<0.5	<1.5

	2 (Predictive)	<5	<25
	3 (Predictive)	<50	<250
	4 (Best Effort)	Unspecified	-
1024 octets	1 (Predictive)	<0.5	<1.5
	2 (Predictive)	<5	<25
	3 (Predictive)	<50	<250
	4 (Best Effort)	Unspecified	-

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

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

A special form of the Write Command, **AT+CGQMIN=<cid>** causes the minimum acceptable profile for context number **<cid>** to become undefined. In this case no check is made against the negotiated profile. The Read Command returns the current settings for each defined context. Details can be found in *3GPP TS 23.107* and all parameters are saved in NV automatically.

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

	[...]
	OK
Write Command	Response
AT+CGQMIN=<cid>[,<precedence>[,<	**OK**
delay>[,<reliability>[,<peak>[,<mean>	
]]]]]	If there is any error related to ME functionality:
	+CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)
<PDP_type>	Packet Data Protocol type
	"IP" Internet Protocol (*IETF STD 5 [103]*)
	"PPP" Point to Point Protocol (*IETF STD 51 [104]*)
	Only IP, IPv6 and IPv4v6 values are supported for EPS services.
	"IPV6" Internet Protocol, version 6
	"IPV4V6" Virtual <PDP_type> introduced to handle dual IP stack UE
capability**<precedence>**	A numeric parameter which specifies the precedence class
	0 Network subscribed value
	1 High Priority. Service commitments shall be maintained ahead of precedence classes 2 and 3
	2 Normal priority. Service commitments shall be maintained ahead of precedence class 3
	3 Low priority. Service commitments shall be maintained
<delay>	A numeric parameter which specifies the delay class. This parameter defines the end-to-end transfer delay incurred in the transmission of SDUs through the network. For the detail please refer to *Table 4*.
	0 Network subscribed value
<reliability>	A numeric parameter which specifies the reliability class.
	0 Network subscribed value
	1 Non real-time traffic, error-sensitive application that cannot cope with data loss
	2 Non real-time traffic, error-sensitive application that can cope with infrequent data loss
	3 Non real-time traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS
	4 Real-time traffic, error-sensitive application that can cope with data loss
	5 Real-time traffic, error non-sensitive application that can cope with data loss

\<peak\>	A numeric parameter which specifies the peak throughput class, in octets per second.
	0 Network subscribed value
	1 Up to 1 000 (8 kbit/s)
	2 Up to 2 000 (16 kbit/s)
	3 Up to 4 000 (32 kbit/s)
	4 Up to 8 000 (64 kbit/s)
	5 Up to 16 000 (128 kbit/s)
	6 Up to 32 000 (256 kbit/s)
	7 Up to 64 000 (512 kbit/s)
	8 Up to 128 000 (1024 kbit/s)
	9 Up to 256 000 (2048 kbit/s)
\<mean\>	A numeric parameter which specifies the mean throughput class, in octets per hour.
	0 Network subscribed value
	1 100 (~0.22 bit/s)
	2 200 (~0.44 bit/s)
	3 500 (~1.11 bit/s)
	4 1 000 (~2.2 bit/s)
	5 2 000 (~4.4 bit/s)
	6 5 000 (~11.1 bit/s)
	7 10 000 (~22 bit/s)
	8 20 000 (~44 bit/s)
	9 50 000 (~111 bit/s)
	10 100 000 (~0.22 kbit/s)
	11 200 000 (~0.44 kbit/s)
	12 500 000(~1.11 kbit/s)
	13 1000 000 (~2.2 kbit/s)
	14 2 000 000 (~4.4 kbit/s)
	15 5 000 000 (~11.1 kbit/s)
	16 10 000 000 (~22 kbit/s)
	17 20 000 000 (~44 kbit/s)
	18 50 000 000 (~111 kbit/s)
	31 Best effort

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

The command allows the TE to specify a UMTS Quality of Service Profile that is used when the MT activates a PDP context. Details can be found in 3GPP TS 23.107 and all parameters are saved in NV automatically.

AT+CGEQREQ 3G Quality of Service Profile (Requested)	
Test Command **AT+CGEQREQ=?**	Response **+CGEQREQ: \<PDP_type\>,**

	(list of supported **<Traffic class>**s), (list of supported **<Maximum bitrate UL>**s), (list of supported **<Maximum bitrate DL>**s), (list of supported **<Guaranteed bitrate UL>**s), (list of supported **<Guaranteed bitrate DL>**s), (list of supported **<Delivery order>**s), (list of supported **<Maximum SDU size>**s), (list of supported **<SDU error ratio>**s), (list of supported **<Residual bit error ratio>**s), (list of supported **<Delivery of erroneous SDUs>**s), (list of supported **<Transfer delay>**s), (list of supported **<Traffic handling priority>**s), (list of supported **<Source statistics descriptor>**s), (list of supported **<Signalling indication>**s) **OK**
Read Command **AT+CGEQREQ?**	Response **[+CGEQREQ: <cid>,** **<Traffic class>,** **<Maximum bitrate UL>,** **<Maximum bitrate DL>,** **<Guaranteed bitrate UL>,** **<Guaranteed bitrate DL>,** **<Delivery order>,** **<Maximum SDU size>,** **<SDU error ratio>,** **<Residual bit error ratio>,** **<Delivery of erroneous SDUs>,** **<Transfer delay>,** **<Traffic handling priority>,** **<Source statistics descriptor>,** **<Signalling indication>]** **[...]** **OK**
Write Command **AT+CGEQREQ=[<cid>[,<Traffic class>[,<Maximum bitrate UL> [,<Maximum bitrate DL> [,<Guaranteed bitrate UL> [,<Guaranteed bitrate DL> [,<Delivery order> [,<Maximum SDU size> [,<SDU error ratio>**	Response **OK** **ERROR**

[,\<Residual bit error ratio> **[,\<Delivery of erroneous SDUs>** **[,\<Transfer delay>** **[,\<Traffic handling priority>** **[,\<Source statistics descriptor>** **[,\<Signalling indication>]]]]]]]]]]]]]]]]**	
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

\<cid>	PDP context identifier, a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command
\<PDP_type>	Packet data protocol type, a string parameter which specifies the type of packet data protocol "IP"　　Internet Protocol (*IETF STD 5 [103]*) "PPP"　　Point to Point Protocol (*IETF STD 51 [104]*) 　　　　Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6"　　Internet Protocol, version 6 "IPV4V6" Virtual \<PDP_type> introduced to handle dual IP stack UE capability The following parameters are defined in *3GPP TS 23.107*
\<Traffic class>	Integer type. Indicates the type of application for which the UMTS bearer service is optimized (refer to *3GPP TS 24.008 **subclause 10.5.6.5***). If the parameter is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided. 0　　　　Conversational 1　　　　Streaming 2　　　　Interactive 3　　　　Background <u>4</u>　　　　Subscribed value
\<Maximum bitrate UL>	Integer type. Indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bit rate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**). <u>0</u>　　　　Subscribed value 1~5760
\<Maximum bitrate DL>	Integer type. Indicates the maximum number of kbits/s delivered by

	UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).
	<u>0</u> Subscribed value
	1~42200
<Guaranteed bitrate UL>	Integer type. Indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).
	<u>0</u> Subscribed value
	1~5760
<Guaranteed bitrate DL>	Integer type. Indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).
	<u>0</u> Subscribed value
	1~42200
<Delivery order>	Integer type. Indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).
	0 No
	1 Yes
	<u>2</u> Subscribed value
<Maximum SDU size>	Integer type. (1,2,3,…) indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).
	<u>0</u> Subscribed value
	10...1520 (Value needs to be divisible by 10 without remainder)
	1520
<SDU error ratio>	String type. Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5*10^{-3}$ would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**).
	"<u>0E0</u>" Subscribed value
	"1E1"
	"1E2"
	"7E3"
	"1E3"
	"1E4"
	"1E5"
	"1E6"
<Residual bit error ratio>	String type. Indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value

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

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

The command allows the TE to specify a minimum acceptable profile, which is checked by the MT against the negotiated profile returned in the PDP context establishment and PDP context modification procedures. Details can be found in *3GPP TS 23.107* and all parameters are saved in NV automatically.

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

	OK
Write Command **AT+CGEQMIN=[<cid>[,<Traffic class>** **[,<Maximum bitrate UL>** **[,<Maximum bitrate DL>** **[,<Guaranteed bitrate UL>** **[,<Guaranteed bitrate DL>** **[,<Delivery order>** **[,<Maximum SDU size>** **[,<SDU error ratio>** **[,<Residual bit error ratio>** **[,<Delivery of erroneous SDUs>** **[,<Transfer delay>** **[,<Traffic handling priority>** **[,<Source statistics descriptor>** **[,<Signalling indication>]]]]]]]]]]]]]]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<cid>	PDP context identifier. A numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command
<PDP_type>	Packet data protocol type. A string parameter which specifies the type of packet data protocol. "IP" Internet Protocol (*IETF STD 5 [103]*) "PPP" Point to Point Protocol (*IETF STD 51 [104]*) Only IP, IPv6 and IPv4v6 values are supported for EPS services. "IPV6" Internet Protocol, version 6 "IPV4V6" Virtual <PDP_type> introduced to handle dual IP stack UE capability The following parameters are defined in *3GPP TS 23.107*
<Traffic class>	Integer type. Indicates the type of application for which the UMTS bearer service is optimized (refer to *3GPP TS 24.008 **subclause 10.5.6.5***). If the parameter is specified as conversational or streaming, then the Guaranteed and Maximum bitrate parameters should also be provided.

	0	Conversational
	1	Streaming
	2	Interactive
	3	Background
	<u>4</u>	Subscribed value
<Maximum bitrate UL>	Integer type. Indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).	
	<u>0</u>	Subscribed value
	1~5760	
<Maximum bitrate DL>	Integer type. Indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).	
	<u>0</u>	Subscribed value
	1~42200	
<Guaranteed bitrate UL>	Integer type. Indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).	
	<u>0</u>	Subscribed value
	1~5760	
<Guaranteed bitrate DL>	Integer type. Indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. **AT+CGEQREQ=…,32, …**).	
	<u>0</u>	Subscribed value
	1~42200	
<Delivery order>	Integer type. Indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).	
	0	No
	1	Yes
	<u>2</u>	Subscribed value
<Maximum SDU size>	Integer type. (1,2,3,…) indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).	
	<u>0</u>	Subscribed value
	10...1520	(value needs to be divisible by 10 without remainder)
	1502	
<SDU error ratio>	String type. Indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of $5*10^{-3}$ would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**).	

	"0E0"	Subscribed value
	"1E2"	
	"7E3"	
	"1E3"	
	"1E4"	
	"1E5"	
	"1E6"	
	"1E1"	

<Residual bit error ratio>	String type. Indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as "mEe". As an example a target residual bit error ratio of $5 \cdot 10\text{-}3$ would be specified as "5E3" (e.g. **AT+CGEQREQ=…,"5E3",…**).	
	"0E0"	Subscribed value
	"5E2"	
	"1E2"	
	"5E3"	
	"4E3"	
	"1E3"	
	"1E4"	
	"1E5"	
	"1E6"	
	"6E8"	

<Delivery of erroneous SDUs>	Integer type. Indicates whether SDUs detected as erroneous shall be delivered or not (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).	
	0	No
	1	Yes
	2	No detect
	3	Subscribed value

<Transfer delay>	Integer type. (0,1,2,…) indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).	
	0	Subscribed value
	100~150	(value needs to be divisible by 10 without remainder)
	200~950	(value needs to be divisible by 50 without remainder)
	1000~4000	(value needs to be divisible by 100 without remainder)

<Traffic handling priority>	Integer type. (1,2,3,…) specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested (refer to *3GPP TS 24.008 **subclause 10.5.6.5***).	
	0	Subscribed
	1	

	2	
	3	
\<Source statistics descriptor\>	Integer type. Specifies characteristics of the source of the submitted SDUs for a PDP context.	
	0	Characteristics of SDUs are unknown
	1	Characteristics of SDUs corresponds to a speech source
\<Signalling indication\>	Integer type. Indicates signaling content of submitted SDUs for a PDP context.	
	0	PDP context is not optimized for signaling
	1	PDP context is optimized for signaling

9.7. AT+CGACT Activate or Deactivate PDP Context

The Write Command is used to activate or deactivate the specified PDP context(s). After the command has been completed, the MT remains in V.250 command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and then attempts to activate the specified contexts. If no **\<cid\>**s specify the activation/deactivation form of the command, it will activate or deactivate all defined contexts.

AT+CGACT Activate or Deactivate PDP Context	
Test Command **AT+CGACT=?**	Response **+CGACT: (list of supported \<state\>s)** **OK**
Read Command **AT+CGACT?**	Response **+CGACT: \<cid\>,\<state\>[\<CR\>\<LF\>** **+CGACT: \<cid\>,\<state** **\>…]** **OK**
Write Command **AT+CGACT=\<state\>,\<cid\>**	Response **OK** **NO CARRIER** If there is any error related to ME functionality: **+CME ERROR: \<err\>**
Maximum Response Time	150s, determined by network.
Reference 3GPP TS 27.007	

Parameter

<state>	Indicates the state of PDP context activation
	0 Deactivated
	1 Activated
	Other values are reserved and will result in an **ERROR** response to the Write Command
<cid>	A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)

Example

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

9.8. AT+CGDATA   Enter Data State

The 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 per-forming a PS attach and one or more PDP context activations. Commands following the **AT+CGDATA** command in the AT command line will not be processed by the MT.

If the **<L2P>** parameter 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** **ERROR** If there is any error related to ME functionality:

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

Parameter

<L2P>   A string parameter that indicates 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 execution command

<cid>   A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)

9.9. AT+CGPADDR   Show PDP Address

The 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
ERROR |
| Maximum Response Time | 300ms |
| Reference
3GPP TS 27.007 | |

Parameter

<cid>   A numeric parameter which specifies a particular PDP context definition (see **AT+CGDCONT** command)

<PDP_addr> A string that identifies the MT in the address space applicable to the PDP. The address

may be static or dynamic. For a static address, it will be the one set by **AT+CGDCONT** command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by **<cid>**. **<PDP_address>** 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	

9.10. AT+CGCLASS   GPRS Mobile Station Class

The command is used to set the MT to operate according to the specified mode of operation. See *3GPP TS 23.060.*

AT+CGCLASS GPRS Mobile Station Class	
Test Command **AT+CGCLASS=?**	Response **+CGCLASS:** (list of supported **<class>**s) **OK**
Read Command **AT+CGCLASS?**	Response **+CGCLASS: <class>** **OK**
Write Command **AT+CGCLASS=<class>**	Response **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<class>	A string parameter which indicates the GPRS mobile class (Functionality in descending order) "A" Class A

9.11. AT+CGREG   Network Registration Status

The 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 in GERAN/UTRAN, or unsolicited result code **+CGREG: <stat>[,[<lac>],[<ci>],[<Act>],[<rac>]]** when **<n>**=2 and there is a change of the network cell in GERAN/UTRAN.

AT+CGREG 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** **ERROR**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<n>	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>	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. The 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 (UMTS/LTE) cell ID in hexadecimal format
<Act>		Access technology selected
	0	GSM
	2	UTRAN
	3	GSM W/EGPRS
	4	UTRAN W/HSDPA
	5	UTRAN W/HSUPA
	6	UTRAN W/HSDPA and HSUPA
	7	E-UTRAN

Example

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

+CGREG: 2
AT+CGATT=1
OK

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

9.12. AT+CGEREP   Packet Domain Event Reporting

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

AT+CGEREP   Packet Domain Event Reporting

Test Command **AT+CGEREP=?**	Response **+CGEREP:** (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** **ERROR**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<mode>	0	Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
	1	Discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode), otherwise forward them directly to the TE.
	2	Buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available. Otherwise forward them directly to the TE.
<bfr>	0	MT buffer of unsolicited result codes defined within this command is cleared when **<mode>** 1 or 2 is entered.
	1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when **<mode>** 1 or 2 is entered (**OK** response shall be given before flushing the codes).

NOTE

The unsolicited result codes and the corresponding events are defined as follows:
1. **+CGEV: REJECT <PDP_type>,<PDP_addr>**: A network request for PDP context activation occurred when the MT was unable to report it to the TE with a **+CRING** unsolicited result code and was automatically rejected.
   Note: This event is not applicable for EPS.
2. **+CGEV: NW REACT <PDP_type>,<PDP_addr>,[<cid>]**: The network has requested a context reactivation. The **<cid>** used to reactivate the context is provided if known to the MT.

Note: This event is not applicable for EPS.

3. **+CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The network has forced a context deactivation. The **<cid>** used to activate the context is provided if known to the MT.

4. **+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]**: The mobile equipment has forced a context deactivation. The **<cid>** used to activate the context is provided if known to the MT.

5. **+CGEV: NW DETACH**: The network has forced a Packet Domain detach. This implies that all active contexts have been deactivated. These are not reported separately.

6. **+CGEV: ME DETACH**: The mobile equipment has forced a Packet Domain detach. This implies that all active contexts have been deactivated. These are not reported separately.

7. **+CGEV: NW CLASS <class>**: The network has forced a change of MS class. The highest available class is reported (see **AT+CGCLASS**).

8. **+CGEV: ME CLASS <class>**: The mobile equipment has forced a change of MS class. The highest available class is reported (see **AT+CGCLASS**).

9. **+CGEV: PDN ACT <cid>**: Activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS.

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

Example

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

OK
AT+CGEREP?
+CGEREP: 0,0

OK
```

9.13. AT+CGSMS   Select Service for MO SMS Messages

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

AT+CGSMS Select Service for MO SMS Messages	
Test Command **AT+CGSMS=?**	Response **+CGSMS:** (list of currently available **<service>**s) **OK**
Read Command **AT+CGSMS?**	Response **+CGSMS: <service>**

	OK
Write Command **AT+CGSMS=[<service>]**	Response **OK** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<service>	A numeric parameter which indicates the service or service preference to be used	
	0	GPRS
	<u>1</u>	Circuit switch
	2	GPRS preferred (use circuit switched if GPRS not available)
	3	Circuit switch preferred (use GPRS if circuit switched not available)

NOTE

The circuit switched service route is the default method.

9.14. AT+CEREG   EPS Network Registration Status

The 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	Response
AT+CEREG[=<n>]	**OK**
	ERROR
Maximum Response Time	300ms
Reference	
3GPP TS 27.007	

Parameter

<n>	0	Disable network registration unsolicited result code
	1	Enable network registration unsolicited result code **+CEREG: <stat>**
	2	Enable network registration and location information unsolicited result code **+CEREG: <stat>[,<tac>,<ci>[,<Act>]]**
<stat>	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>		Access technology selected
	0	GSM
	2	UTRAN
	3	GSM W/EGPRS
	4	UTRAN W/HSDPA
	5	UTRAN W/HSUPA
	6	UTRAN W/HSDPA and HSUPA
	7	E-UTRAN

9.15. AT+QGDCNT   Packet Data Counter

The command allows the application to check how much bytes are sent to or received by the module.

AT+QGDCNT	**Packet Data Counter**
Test Command	Response
AT+QGDCNT=?	**+QGDCNT: (0,1)**
	OK

Read Command	Response
AT+QGDCNT?	**+QGDCNT: <bytes_sent>,<bytes_recv>**
	OK
Write Command	Response
AT+QGDCNT=<op>	**OK**
	ERROR
	If there is any error related to ME functionality:
	+CME ERROR: <err>
Maximum Response Time	300ms

Parameter

<op>	A numeric parameter. 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** command.
<bytes_sent>	A numeric parameter. The amount of sent bytes.
<bytes_recv>	A numeric parameter. The amount of received bytes.

NOTE

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

Example

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

OK

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

OK

AT+QGDCNT=1         //Save the results to NV
OK

AT+QGDCNT =0        //Reset counter
```

OK

9.16. AT+QAUGDCNT   Auto Save Packet Data Counter

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

AT+QAUGDCNT Auto Save Packet Data Counter	
Test Command **AT+QAUGDCNT=?**	Response **+QAUGDCNT: (0,30-65535)** **OK**
Read Command **AT+QAUGDCNT?**	Response **+QAUGDCNT: <value>** **OK**
Write Command **AT+QAUGDCNT=<value>**	Response **OK** **ERROR** If there is any error related to ME functionality: **+CME ERROR: <err>**
Maximum Response Time	300ms

Parameter

<value>	A numeric parameter. Default value is 0. The parameter is the time-interval for command **AT+QGDCNT** to save results to NV automatically. If it is set to 0, auto-save feature would be disabled. Unit is second.

┌─────────┐
│ NOTE   │
└─────────┘

The configuration would not be saved into NV.

Example

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

OK

AT+QGDCNT=35   //Set **<value>**

OK

AT+QAUGDCNT?   //Query the interval of auto-save

+QAUGDCNT: 35

OK

AT+QGDCNT=35   //Set **<value>**

OK

10 Hardware Related Commands

10.1. AT+QPOWD　Power off

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

AT+QPOWD　Power off	
Test Command **AT+QPOWD=?**	Response **+QPOWD: (0,1)** **OK**
Execution Command **AT+QPOWD[=<n>]**	Response **OK** **POWERED DOWN**
Maximum Response Time	300ms

Parameter

<n>	0	Immediately power down
	1	Normal power down

10.2. AT+CCLK　Clock

The 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	Response
AT+CCLK?	**+CCLK: <time>**
	OK
Write Command	Response
AT+CCLK=<time>	**OK**
	If there is any error related to ME functionality:
	+CME ERROR: <err>
Maximum Response Time	300ms
Reference	
3GPP TS 27.007	

Parameter

<time>	String type value. 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...+56). E.g. May 6th, 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08".

Example

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

OK

10.3. AT+QSCLK   Enable/Disable Entering into Sleep Mode

The command is used to control whether the module enters into sleep mode. When entering into sleep mode is enabled, DTR is pulled up and WAKEUP_IN is pulled up, the module can directly enter into sleep mode. If entering into sleep mode is enabled, DTR is pulled down and WAKEUP_IN is pulled down, there is a need to pull the DTR pin and the WAKEUP_IN pin up first, and then the module can enter into sleep mode.

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

Read Command	Response
AT+QSCLK?	**+QSCLK: <n>** **OK**
Write Command	Response
AT+QSCLK=<n>	**OK**
Maximum Response Time	300ms
Reference Quectel	

Parameter

<n>	<u>0</u>	Disable slow clock
	1	Enable slow clock. It is controlled by DTR

11 Appendixes

11.1. References

Table 5: Related Documents

SN	Document Name	Remark
[1]	V.25ter	Serial asynchronous automatic dialing and control
[2]	3GPP TS 27.007	Digital cellular telecommunications (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; AT command set for User Equipment (UE)
[3]	3GPP TS 27.005	Digital cellular telecommunications (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Use of Data Terminal Equipment – Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)

Table 6: Terms and Abbreviations

Abbreviation	Description
AMR	Adaptive Multi-Rate
CS	Circuit Switching
CSD	Circuit Switch Data
DCD	Dynamic Content Delivery
DCE	Data Communication Equipment
DTE	Data Terminal Equipment

DTR	Data Terminal Ready
ECT	Explicit Call Transfer supplementary service
GPRS	General Packet Radio Service
ME	Mobile Equipment
MS	Mobile Station
PDP	Packet Data Protocol
PS	Packet Switching
PSC	Primary Synchronization Code
RTS/CTS	Request To Send/Clear To Send
TA	Terminal Adapter
TCP	Transmission Control Protocol
TE	Terminal Equipment
UDP	User Datagram Protocol
UE	User Equipment
NV	Non-Volatile Random Access Memory

11.2. Factory Default Settings Restorable with AT&F

Table 7: Factory Default Settings Restorable with AT&F

AT Command	Parameters	Factory Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATS3	<n>	13

ATS4	<n>	10
ATS5	<n>	8
ATS6	<n>	2
ATS7	<n>	0
ATS8	<n>	2
ATS10	<n>	15
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CBST	<speed>,<name>,<ce>	0,0,1
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+CSCB	<mode>	0
AT+CPMS	<mem1>,<mem2>,<mem3>	"ME","ME","ME"
AT+CNMI	<mode>,<mt>,<bm>,<ds>,<bfr>	2,1,0,0,0

AT+CMMS	<n>	0
AT+CVHU	<mode>	0
AT+COLP	<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+CLVL	<level>	3
AT+QAUDMOD	<mode>	0
AT+QAUDLOOP	<enable>	0

11.3. AT Command Settings Storable with AT&W

Table 8: 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
ATS10	<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

11.4. AT Command Settings Storable with ATZ

Table 9: AT Command Settings Storable with ATZ

AT Command	Parameters	Factory Defaults
ATE	<value>	1
ATQ	<n>	0
ATS0	<n>	0
ATS7	<n>	0
ATS10	<n>	15
ATV	<value>	1
ATX	<value>	4
AT&C	<value>	1
AT&D	<value>	2
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CEREG	<n>	0

11.5. 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 10: 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

11.6. 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 11: Different Coding Schemes of +CMS ERROR: <err>

Code of <err>	Meaning
300	ME failure
301	SMS ME reserved
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode
305	Invalid text mode
310	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
500	Unknown
512	SIM not ready
513	Message length exceeds
514	Invalid request parameters
515	ME storage failure
517	Invalid service mode
528	More message to send state error
529	MO SMS is not allow
530	GPRS is suspended
531	ME storage full

11.7. Summary of URC

Table 12: 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	+CGREG: <stat>	Indicate network registration status of the ME	AT+CGREG=1
4	+CGREG: <stat>[,<lac>,<ci>[,<Act>]]	Indicate network registration and location information of the ME	AT+CGREG=2

5	+CTZV: \<tz>	Time zone reporting	AT+CTZR=1
6	+CTZE: \<tz>,\<dst>,\<time>	Extended time zone reporting	AT+CTZR=2
7	+CMTI: \<mem>,\<index>	New message is received, and saved to memory	See AT+CNMI
8	+CMT: [\<alpha>],\<length>\<CR>\<LF>\<pdu>	New short message is received and output directly to TE (PDU mode)	See AT+CNMI
9	+CMT: \<oa>,[\<alpha>],\<scts>[,\<tooa>,\<fo>,\<pid>,\<dcs>,\<sca>,\<tosca>,\<length>]\<CR>\<LF>\<data>	New short message is received and output directly to TE (Text mode)	See AT+CNMI
10	^HCMT: \<oa>,\<scts>,\<lang>,\<fmt>,\<length>,\<prt>,\<prv>,\<type>,\<stat>\<CR>\<LF>\<data>	New short message is received and output directly to TE	See AT+CNMI
11	+CBM: \<length>\<CR>\<LF>\<pdu>	New CBM is received and output directly (PDU mode)	See AT+CNMI
12	+CBM: \<sn>,\<mid>,\<dcs>,\<page>,\<pages>\<CR>\<LF>\<data>	New CBM is received and output directly to TE (Text mode)	See AT+CNMI
13	+CDS: \<length>\<CR>\<LF>\<pdu>	New CDS is received and output directly (PDU mode)	See AT+CNMI
14	+CDS: \<fo>,\<mr>,[\<ra>],[\<tora>],\<scts>,\<dt>,\<st>	New CDS is received and output directly to TE (Text mode)	See AT+CNMI
15	+CDSI: \<mem>,\<index>	New message status report is received, and saved to memory	See AT+CNMI
16	^HCDS: \<oa>,\<scts>,\<lang>,\<fmt>,\<length>,\<prt>,\<prv>,\<type>,\<stat>\<CR>\<LF>\<data>	New CDS is received and output directly to TE	See AT+CNMI
17	+COLP: \<number>,\<type>,[\<subaddr>],[\<satype>],[\<alpha>]	The presentation of the COL (connected line) at the TE for a mobile originated call	AT+COLP=1
18	+CLIP: \<number>,\<type>,[subaddr],[satype],[\<alpha>],\<CLI validity>	Mobile terminating call indication	AT+CLIP=1
19	+CRING: \<type>	An incoming call is indicated to the TE with unsolicited result code instead of the normal RING	AT+CRC=1

20	+CCWA: <number>,<type>,<class>[,<alpha>]	Call waiting indication	AT+CCWA=1,1
21	+CSSI: <code1>	Shows the +CSSI intermediate result code presentation status to the TE	AT+CSSN=1
22	+CSSU: <code2>	Shows the +CSSU unsolicited result code presentation status to the TE	AT+CSSN=<n>,1
23	+CUSD: <status>[,<rspstr>,[<dcs>]]	USSD response from the network, or a network initiated operation	AT+CUSD=1
24	RDY	ME initialization is successful	N/A
25	+CFUN: 1	All function of the ME is available	N/A
26	+CPIN: <state>	SIM card pin state	N/A
27	+QIND: SMS DONE	SMS initialization finished	N/A
28	+QIND: PB DONE	Phonebook initialization finished	N/A
29	POWERED DOWN	Module power down	AT+QPOWD
30	+CGEV: REJECT <PDP_type>,<PDP_addr>	A network request for PDP activation, and was automatically rejected.	AT+CGEREP=2,1
31	+CGEV: NW REACT <PDP_type>,<PDP_addr>, [<cid>]	The network request PDP reactivation	AT+CGEREP=2,1
32	+CGEV: NW DEACT <PDP_type>,<PDP_addr>, [<cid>]	The network has forced a context deactivation	AT+CGEREP=2,1
33	+CGEV: ME DEACT <PDP_type>,<PDP_addr>, [<cid>]	The ME has forced a context deactivation.	AT+CGEREP=2,1
34	+CGEV: NW DETACH	The network has forced a Packet Domain detach.	AT+CGEREP=2,1
35	+CGEV: ME DETACH	The mobile equipment has forced a Packet Domain detach.	AT+CGEREP=2,1
36	+CGEV: NW CLASS <class>	The network has forced a change of MS class.	AT+CGEREP=2,1
37	+CGEV: ME CLASS <class>	The mobile equipment has forced a change of MS class.	AT+CGEREP=2,1

11.8. 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 13: 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 14: 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 15: 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 16: 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 17: 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 18: IRA Extended Characters

	A	B	C	D	E	F
0	20	20	20	20	7F	20
1	40	20	20	5D	20	7D
2	20	20	20	20	20	08
3	01	20	20	20	20	20
4	24	20	5B	20	7B	20
5	03	20	0E	20	0F	20
6	20	20	1C	5C	1D	7C
7	5F	20	09	20	20	20

8	20	20	20	0B	04	0C
9	20	20	1F	20	05	06
A	20	20	20	20	20	20
B	20	20	20	20	20	20
C	20	20	20	5E	07	7E
D	20	20	20	20	20	20
E	20	20	20	20	20	20
F	20	60	20	1E	20	20

Table 19: 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 20: 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 13* for more details.

11.9. Release Cause Text List of AT+CEER

Table 21: Release Cause Text List of AT+CEER

CS Internal Cause
No cause information available (default)
Phone is offline
No service available
Network release, no reason given
Received incoming call
Client ended call
UIM not present
Access attempt already in progress
Access failure, unknown source
Concur service not supported by network
No response received from network
GPS call ended for user call
SMS call ended for user call
Data call ended for emergency call
Rejected during redirect or handoff
Lower-layer ended call
Call origination request failed
Client rejected incoming call
Client rejected setup indication
Network ended call
No funds available
No service available

Full service not available

Maximum packet calls exceeded

Video connection lost

Video protocol closed after setup

Video protocol setup failure

Internal error

CS Network Cause

Unassigned/unallocated number

No route to destination

Channel unacceptable

Operator determined barring

Normal call clearing

User busy

No user responding

User alerting, no answer

Call rejected

Number changed

Non selected user clearing

Destination out of order

Invalid/incomplete number

Facility rejected

Response to status enquiry

Normal, unspecified

No circuit/channel available

Network out of order

Temporary failure

Switching equipment congestion

Access information discarded

Requested circuit/channel not available

Resources unavailable, unspecified

Quality of service unavailable

Requested facility not subscribed

Incoming calls barred within the CUG

Bearer capability not authorized

Bearer capability not available

Service/option not available

Bearer service not implemented

ACM >= ACM max

Requested facility   not implemented

Only RDI bearer is available

Service/option not implemented

Invalid transaction   identifier value

User not member of CUG

Incompatible destination

Invalid transit network selection

Semantically incorrect message

Invalid mandatory information

Message non-existent/not implemented

Message type not compatible with state

IE non-existent/not implemented

Conditional IE error

Message not compatible with state

| Recovery on timer expiry |
| Protocol error, unspecified |
| Interworking, unspecified |
| **CS Network Reject** |
| IMSI unknown in HLR |
| Illegal MS |
| IMSI unknown in VLR |
| IMEI not accepted |
| Illegal ME |
| GPRS services not allowed |
| GPRS and non GPRS services not allowed |
| MS identity cannot be derived |
| Implicitly detached |
| PLMN not allowed |
| Location area not allowed |
| Roaming not allowed |
| GPRS services not allowed in PLMN |
| No suitable cells in location area |
| MSC temporary not reachable |
| Network failure |
| MAC failure |
| Synch failure |
| Congestion |
| GSM authentication unacceptable |
| Service option not supported |
| Requested service option not subscribed |

Service option temporary out of order
Call cannot be identified
No PDP context activated
Semantically incorrect message
Invalid mandatory information
Message type non-existent
Message type not compatible with state
Information element non-existent
Message not compatible with state
RR release indication
RR random access failure
RRC release indication
RRC close session indication
RRC open session failure
Low level failure
Low level failure no redial allowed
Invalid SIM
No service
Timer T3230 expired
No cell available
Wrong state
Access class blocked
Abort message received
Other causes
Timer T303 expired
No resources

Release pending
Invalid user data
PS Internal Cause
Invalid connection identifier
Invalid NSAPI
Invalid primary NSAPI
PDP establish timeout
Invalid field
SNDCP failure
RAB setup failure
No GPRS context
PDP activate timeout
PDP modify timeout
PDP inactive max timeout
PDP lower layer error
PDP duplicate
Access technology change
PDP unknown reason
CS PS Network Cause
LLC or SNDCP failure
Insufficient resources
Missing or unknown APN
Unknown PDP address or PDP type
User authentication failed
Activation rejected by GGSN
Activation rejected, unspecified

Service option not supported

Requested service option not subscribed

Service option temporary out of order

NSAPI already used (not sent)

Regular deactivation

QoS not accepted

Network failure

Reactivation required

Feature not supported

Semantic error in the TFT operation

Syntactical error in the TFT operation

Unknown PDP context

PDP context without TFT already activated

Semantic errors in packet filter

Syntactical errors in packet filter

Invalid transaction identifier

Semantically incorrect message

Invalid mandatory information

Message non-existent/not implemented

Message type not compatible with state

IE non-existent/not implemented

Conditional IE error

Message not compatible with state

Protocol error, unspecified