

EC25&EC21

AT Commands Manual

LTE Module Series

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Example

AT+CTZU?

+CTZU: 0

OK

AT+CTZU=?

+CTZU: (0,1)

OK

AT+CTZU=1

OK

AT+CTZU?

+CTZU: 1

OK

6.7. AT+CTZR Time Zone Reporting

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

AT+CTZR Time Zone Reporting

Test Command

AT+CTZR=?

Response

+CTZR: (0-2)

OK

Write Command

AT+CTZR=<reporting>

Response

OK

ERROR

Read Command

AT+CTZR?

Response

+CTZR: <reporting>

OK

Maximum Response Time

300ms

Reference

3GPP TS 27.007

Parameter

<reporting>	Integer type, indicates the mode of time zone reporting <ul style="list-style-type: none"> 0 Disable time zone reporting of changed event 1 Enable time zone reporting of changed event by unsolicited result code +CTZV: <tz> 2 Enable extended time zone reporting by unsolicited result code +CTZE: <tz>,<dst>,<time>
<tz>	String type, represents 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 <ul style="list-style-type: none"> 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, represents 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,"2013/08/23,06:51:13" //<reporting> is 2

```

6.8. AT+QNWINFO Query Network Information

AT+QNWINFO indicates the Access technology selected **<Act>**, the operator **<oper>** and the band selected **<band>**.

AT+QNWINFO Query Network Information

Test Command AT+QNWINFO=?	Response OK
Execution Command AT+QNWINFO	Response +QNWINFO: <Act>,<oper>,<band>,<channel> OK
Maximum Response Time	300ms

Parameter

<Act>	String type; Access technology selected "NONE" "CDMA1X" "CDMA1X AND HDR" "CDMA1X AND EHRPD" "HDR" "HDR-EHRPD" "GSM" "GPRS" "EDGE" "WCDMA" "HSDPA" "HSUPA" "HSPA+" "TDSCDMA" "TDD LTE" "FDD LTE"
<oper>	String type; operator in numeric format
<band>	String type; band selected "CDMA BC0" – "CDMA BC19" "GSM 450" "GSM 480" "GSM 750" "GSM 850" "GSM 900" "GSM 1800" "GSM 1900" "WCDMA 2100" "WCDMA 1900" "WCDMA 1800" "WCDMA 1700 US"

“WCDMA 850”
“WCDMA 800”
“WCDMA 2600”
“WCDMA 900”
“WCDMA 1700 JAPAN”
“WCDMA 1500”
“WCDMA 850 JAPAN”
“LTE BAND 1” – “LTE BAND 43”
“TDSCDMA BAND A”
“TDSCDMA BAND B”
“TDSCDMA BAND C”
“TDSCDMA BAND D”
“TDSCDMA BAND E”
“TDSCDMA BAND F”

<channel>

Integer type; channel ID **<band>**

String type; band selected

Example

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

7 Call Related Commands

7.1. ATA Answer an Incoming Call

ATA connects the module to an incoming voice or data call indicated by a “RING” URC.

ATA Answer an Incoming Call

Execution Command

ATA

Response

TA sends off-hook to the remote station.

Response in case of a data call, if successfully connected

CONNECT<text> TA switches to data mode.

Note: <text> outputs only when <value> >0 in **ATX<value>** parameter setting.

When TA returns to command mode after call release:

OK

Response in case of a voice call, if successfully connected:

OK

Response if no connection:

NO CARRIER

Maximum Response Time

90s, determined by network.

Reference

V.25ter

NOTES

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

Example

```
RING //A voice call is ringing
AT+CLCC
+CLCC: 1,0,0,1,0,"",128 //PS call in LTE mode
```

```
+CLCC: 2,1,4,0,0,"02154450290",129 //Incoming call
OK
ATA //Accept the voice call with ATA
OK
```

7.2. ATD Mobile Originated Call to Dial a Number

ATD can be used to set up outgoing voice and data calls. Supplementary Services can also be controlled with ATD.

ATD Mobile Originated Call to Dial a Number

Execution Command
ATD<n>[<mgsms>][:]

Response

This command can be used to set up outgoing voice, data or FAX calls. It also serves to control supplementary services.

If no dial tone and (parameter setting **ATX2** or **ATX4**):

NO DIALTONE

If busy and (parameter setting **ATX3** or **ATX4**):

BUSY

If a connection cannot be established:

NO CARRIER

If connection is successful and non-voice call.

CONNECT<text> TA switches to data mode.

<text> outputs only when **<value>** >0 in **ATX<value>** parameter setting.

When TA returns to command mode after call release:

OK

If connection is successful and voice call:

OK

Maximum Response Time

5s, determined by network (AT+COLP=0).

Reference
V.25ter

Parameter

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

NOTES

1. This command may be aborted generally by receiving an **ATH** command or a character during execution. The aborting is not possible during some states of connection establishment such as handshaking.
2. Parameter "I" and "i" only if no *# code is within the dial string.
3. See **ATX** command for setting result code and call monitoring parameters.
4. Responses returned after dialing with **ATD**
For voice call, two different responses mode can be determined. TA returns "OK" immediately either after dialing was completed or after the call was established. The setting is controlled by **AT+COLP**. Factory default is **AT+COLP=0**, which causes the TA to return "OK" immediately after dialing was completed; otherwise TA will return "OK", "BUSY", "NO DIAL TONE", or "NO CARRIER".
5. Using **ATD** during an active voice call:
 - When a user originates a second voice call while there is already an active voice call, the first call will be automatically put on hold.
 - The current states of all calls can be easily checked at any time by using the **AT+CLCC** command.

Example

```
ATD10086; //Dialing out the party's number
OK
```

7.3. ATH Disconnect Existing Connection

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

ATH Disconnect Existing Connection

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

Parameter

<n>	0	Disconnect from line and terminate the call
-----	---	---

7.4. AT+CVHU Voice Hang up Control

AT+CVHU controls whether ATH can be used to disconnect the voice call.

AT+CVHU Voice Hang up Control

Test Command AT+CVHU=?	Response +CVHU: (list of supported<mode>s) OK
Read Command AT+CVHU?	Response +CVHU: <mode> OK
Write Command AT+CVHU=<mode>	Response OK ERROR
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

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

7.5. AT+CHUP Hang up Call

AT+CHUP cancels all voice calls in the state of Active, Waiting and Held. For data connections, use ATH.

AT+CHUP Hang up Call

Test Command AT+CHUP=?	Response OK
Execution Command AT+CHUP	Response OK ERROR
Maximum Response Time	90s, determined by network.
Reference 3GPP 27.007	

Example

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

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

The +++ character sequence causes the module to switch from data mode to AT command mode. It allows inputting AT commands while maintaining the data connection with the remote device.

+++ Switch from Data Mode to Command Mode

Execution Command +++	Response This command is only available when TA is in data mode. The“+++” character sequence causes the TA to cancel the data flow over the AT interface and switch to command mode. This allows you to enter AT command while maintaining the data connection with the remote server or, accordingly, the GPRS connection. OK
Maximum Response Time	300ms
Reference V.25ter	

NOTES

1. To prevent the“+++” escape sequence from being misinterpreted as data, it should comply to following sequence:
 - Do not input any character within T1 time (1000ms) before inputting “+++”.
 - Input “+++” within 1000ms, and no other characters can be inputted during the time.
 - Do not input any character within T1 time (1000ms) after “+++” has been inputted.
 - Switch to command mode; otherwise return to step 1.
2. To return from command mode back to data mode: Enter **ATO**
 - Another way to change to command mode is through DTR, refer to **AT&D** command for details.

7.7. ATO Switch from Command Mode to Data Mode

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

ATO Switch from Command Mode to Data Mode

Execution Command ATO[n]	Response TA resumes the connection and switches back from command mode to data mode. If connection is not successfully resumed: NO CARRIER Else TA returns to data mode from command mode CONNECT <text>
Maximum Response Time	300ms
Reference	V.25ter

Parameter

<n>	0	Switch from command mode to data mode
------------------	---	---------------------------------------

NOTE

TA returns to data mode from command mode **CONNECT <text>**; **<text>** outputs only when **<value> >0** in **ATX<value>** parameter setting.

7.8. ATSO Set Number of Rings before Automatically Answering Call

ATSO controls automatic answering mode for the incoming calls.

ATSO Set Number of Rings before Automatically Answering Call

Read Command ATSO?	Response <n> OK
Write Command ATSO=<n>	Response This parameter setting determines the number of rings before auto-answer. OK
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	<u>0</u>	Automatic answering is disabled
	1-255	Enable automatic answering on the ring number specified

NOTE

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

Example

```

ATSO=3 //Set three rings before automatically answering a call
OK

RING //Call coming

RING

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

7.9. ATS6 Set Pause before Blind Dialing

ATS6 is implemented for compatibility reasons only, and has no effect.

ATS6 Set Pause before Blind Dialing

Read Command ATS6?	Response <n> OK
Write Command ATS6=<n>	Response OK
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	0-2-10	Number of seconds to wait before blind dialing
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7.10. ATS7 Set Number of Seconds to Wait for Connection Completion

ATS7 specifies the amount of time to wait for the connection completion in case of answering or originating a call. If no connection is established during the time, the module disconnects from the line.

ATS7 Set Number of Seconds to Wait for Connection Completion

Read Command ATS7?	Response <n> OK
Write Command ATS7=<n>	Response This parameter setting determines the amount of time to wait for the connection completion in case of answering or originating a call. OK
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	<u>0</u>	Disabled
	1-255	Number of seconds to wait for connection completion

7.11. ATS8 Set the Number of Seconds to Wait for Comma Dial Modifier

ATS8 is implemented for compatibility reasons only, and has no effect.

ATS8 Set the Number of Seconds to Wait for Comma Dial Modifier

Read Command ATS8?	Response <n> OK
Write Command ATS8=<n>	Response OK
Maximum Response Time	300ms
Reference V.25ter	

Parameter

<n>	0	No pause when comma encountered in dial string
	1- <u>2</u> -255	Number of seconds to wait

7.12. ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier

ATS10 determines the amount of time, during which the UE remains connected in absence of a data carrier.

ATS10 Set Disconnect Delay after Indicating the Absence of Data Carrier

Read Command ATS10?	Response <n> OK
Write Command	Response

ATS10=<n>	This parameter setting determines the amount of time that the TA will remain connected in absence of data carrier. If the data carrier is once more detected before disconnection, the TA remains connected. OK
Maximum Response Time	300ms
Reference	V.25ter

Parameter

<n>	1-15-254	Number of tenths of seconds to wait before disconnecting after UE has indicated the absence of received line signal
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7.13. AT+CBST Select Bearer Service Type

AT+CBST write command selects the bearer service **<name>**, the data rate **<speed>** and the connection element **<ce>** to be used when data calls are originated.

AT+CBST Select Bearer Service Type	
Test Command AT+CBST=?	Response +CBST: (list of supported <speed> s),(list of supported <name> s),(list of supported <ce> s) OK
Read Command AT+CBST?	Response +CBST: <speed> , <name> , <ce> OK
Write Command AT+CBST=[<speed>[,<name>[,<ce>]]]	Response TA selects the bearer service <name> with data rate <speed> , and the connection element <ce> to be used when data calls are originated. OK
Maximum Response Time	300ms
Reference	3GPP TS 27.007

Parameter

<speed>	<u>0</u>	Automatic speed selection
	7	9600 bps (V.32)
	12	9600 bps (V.34)
	14	14400 bps (V.34)
	16	28800 bps (V.34)
	17	32000 bps (V.34)
	39	9600 bps (V.120)
	43	14400 bps (V.120)
	48	28800 bps (V.120)
	51	56000 bps (V.120)
	71	9600 bps (V.110)
	75	14400 bps (V.110)
	80	28800 bps (V.110 or X.31 flag stuffing)
	81	38400 bps (V.110 or X.31 flag stuffing)
83	56000 bps (V.110 or X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI or RDI service in order to get FTM84 64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)	
84	64000 bps (X.31 flag stuffing; this setting can be used in conjunction with asynchronous non-transparent UDI service in order to get FTM)	
116	64000 bps (bit transparent)	
134	64000 bps (multimedia)	
<name>	<u>0</u>	Asynchronous Modem
	1	Synchronous Modem
	4	Asynchronous Modem (RDI)
<ce>	0	Transparent
	<u>1</u>	Non-transparent

Table 4: Parameter Configurations Supported by AT+CBST

<speed>	GSM	WCDMA	SYNC.	ASYNC.	ASYNC. (RDI)	TRANSP.	NON- TRANSP.
0	Y	Y	N	Y	N	N	Y
7	Y	N	N	Y	N	N	Y
12	Y	N	N	Y	N	N	Y
14	Y	Y	N	Y	N	N	Y
16	N	Y	N	Y	N	N	Y

17	N	Y	N	Y	N	N	Y
39	Y	N	N	Y	N	N	Y
43	Y	Y	N	Y	N	N	Y
48	N	Y	N	Y	N	N	Y
51	N	Y	N	Y	N	N	Y
71	Y	N	N	Y	N	N	Y
75	Y	Y	N	Y	N	N	Y
80	Y	Y	N	Y	N	N	Y
81	Y	Y	N	Y	N	N	Y
83	Y	Y	N	Y	Y	N	Y
84	N	Y	N	Y	N	N	Y
116	N	Y	Y	N	N	Y	N
134	N	Y	Y	N	N	Y	N

NOTE

3GPP TS 22.002 lists the allowed combinations of the sub-parameters.

7.14. AT+CSTA Select Type of Address

AT+CSTA write command selects the type of number for further dialing commands ATD according to 3GPP Technical Specifications. Test command returns values supported a compound value.

AT+CSTA Select Type of Address

Test Command AT+CSTA=?	Response +CSTA: (list of supported <type>s) OK
----------------------------------	--

Read Command AT+CSTA?	Response +CSTA: <type>
---------------------------------	----------------------------------

	OK
Write Command AT+CSTA=<type>	Response OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<type>	Current address type setting.
129	Unknown type
145	International type (contains the character "+")

7.15. AT+CLCC List Current Calls of ME

The execution command returns the list of all current calls. If the command is executed successfully, but no calls existed, no information response but OK is sent to TE.

AT+CLCC List Current Calls of ME

Test Command AT+CLCC=?	Response OK
Execution Command AT+CLCC	Response TA returns a list of current calls of ME. If command executed successfully, but no calls are existed, no information but OK response is sent to TE. [+CLCC : <id1>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>[,<alpha>]] [+CLCC: <id2>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>[,<alpha>]] [...] OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms

Parameter

<idx>	Integer type; call identification number as described in 3GPP TS 22.030 sub clause 4.5.5.1; this number can be used in AT+CHLD Command operations
<dir>	0 Mobile originated (MO) call 1 Mobile terminated (MT) call
<stat>	State of the call 0 Active 1 Held 2 Dialing (MO call) 3 Alerting (MO call) 4 Incoming (MT call) 5 Waiting (MT call)
<mode>	Bearer/tele service 0 Voice 1 Data 2 FAX
<empty>	0 Call is not one of multiparty (conference) call parties 1 Call is one of multiparty (conference) call parties
<number>	Phone number in string type in format specified by <type>
<type>	Type of address of octet in integer format(Refer to 3GPP TS 24.008, subclause 10.5.4.7 for details). Usually, it has three kinds of values: 129 Unknown type 145 International type (contains the character "+") 161 National type
<alpha>	Alphanumeric representation of <number> corresponding to the entry found in phonebook.

Example

```

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

```

7.16. AT+CR Service Reporting Control

AT+CR controls the module whether or not to transmit an intermediate result code **+CR: <serv>** to the TE when a call is being set up.

If it is enabled, an intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before any final result code (e.g. **CONNECT**) is transmitted.

AT+CR Service Reporting Control

Test Command AT+CR=?	Response +CR: (list of supported <mode> s) OK
Read Command AT+CR?	Response +CR: <mode> OK
Write Command AT+CR=[<mode>]	Response TA controls whether or not intermediate result code +CR: <serv> is returned from the TA to the TE when a call is set up. OK
Maximum Response Time	300ms
Reference	3GPP TS 27.007

Parameter

<mode>	<u>0</u>	Disable
	1	Enable
<serv>	ASYNC	Asynchronous transparent
	SYNC	Synchronous transparent
	REL ASYNC	Asynchronous non-transparent
	REL SYNC	Synchronous non-transparent
	GPRS	GPRS

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

AT+CRC controls whether or not to use the extended format of incoming call indication.

When it is enabled, an incoming call is indicated to the TE with unsolicited result code **+CRING: <type>** instead of the normal **RING**.

AT+CRC Set Cellular Result Codes for Incoming Call Indication

Test Command AT+CRC=?	Response +CRC: (list of supported <mode>s) OK
Read Command AT+CRC?	Response +CRC: <mode> OK
Write Command AT+CRC=[<mode>]	Response TA controls whether or not the extended format of incoming call indication is used. OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<mode>	0	Disable extended format
	1	Enable extended format
<type>	ASYNCRING	Asynchronous transparent
	SYNCRING	Synchronous transparent
	RELASYNCRING	Asynchronous non-transparent
	REL SYNCRING	Synchronous non-transparent
	FAX	Facsimile
	VOICE	Voice

Example

```

AT+CRC=1 //Enable extended format
OK

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

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

7.18. AT+CRLP Select Radio Link Protocol Parameter

AT+CRLP write command sets radio link protocol (RLP) parameters used when non-transparent data calls are originated.

AT+CRLP Select Radio Link Protocol Parameter

<p>Test Command AT+CRLP=?</p>	<p>Response TA returns values supported. RLP (Radio Link Protocol) versions 0 and 1 share the same parameter set. TA returns only one line for this set (where <ver> is not presented). +CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s), <ver> +CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s), <ver> +CRLP: (list of supported <iws>s),(list of supported <mws>s),(list of supported <T1>s),(list of supported <N2>s), <ver></p> <p>OK</p>
<p>Read Command AT+CRLP?</p>	<p>Response TA returns current settings for RLP version. RLP versions 0 and 1 share the same parameter set. TA returns only one line for this set (where <ver> is not presented). +CRLP: <iws>,<mws>,<T1>,<N2>,<ver> +CRLP: <iws>,<mws>,<T1>,<N2>,<ver> +CRLP: <iws>,<mws>,<T1>,<N2>,<ver></p> <p>OK</p>
<p>Write Command AT+CRLP=[<iws>,<mws>,<T1>,<N2>,<ver>]]]]</p>	<p>Response TA sets radio link protocol (RLP) parameters used when non-transparent data calls are set up.</p> <p>OK</p>
<p>Maximum Response Time</p>	<p>300ms</p>
<p>Reference 3GPP TS27.007</p>	

Parameter

<iws>	0- <u>61</u> 0- <u>240</u> -488	Interworking window size (IWF to MS) For <ver> =2
<mws>	0- <u>61</u> 0- <u>240</u> -488	Mobile window size (MS to IWF) For <ver> =2
<T1>	38- <u>48</u> -255 42- <u>52</u> -255	Acknowledgment timer T1 in a unit of 10ms For <ver> =2
<N2>	1- <u>6</u> -255	Retransmission attempts N2
<ver>	0-2	RLP version number in integer format

7.19. AT+QECCNUM Configure Emergency Call Numbers

AT+QECCNUM can be used to query, add and delete ECC numbers (emergency call numbers). There are two kinds of ECC numbers: ECC numbers without SIM and ECC numbers with SIM. The default ECC numbers without SIM is 911, 112, 00, 08, 110, 999, 118 and 119. The default ECC number with SIM is 911 and 112. 911 and 112 will always be supported as ECC numbers, and can't be deleted. ECC numbers can be saved into NV automatically. If the SIM card contains ECC File, the numbers in ECC File can also be regarded as ECC numbers.

The maximal supported ECC numbers of each type is 20.

AT+QECCNUM Configure Emergency Call Numbers	
Test Command AT+QECCNUM=?	Response +QECCNUM: (0-2) OK
Write Command AT+QECCNUM=<mode>,<type>[,<eccnum1>[,<eccnum2>,...[,<eccnumN>]]]]	Response If <mode> is equal to 0, query the ECC numbers, <eccnumN> should be omitted, returns: +QECCNUM: <type>,<eccnum1>,<eccnum2>[...] OK If <mode> is not equal to 0: <mode> =1 is used to add the ECC number; <mode> =2 is used to delete the ECC number. In this case, at least one ECC number <eccnumN> should be inputted, returns: OK ERROR
Read Command AT+QECCNUM?	Response +QECCNUM: 0,<eccnum1>,<eccnum2>[...]

	+QECCNUM: 1,<eccnum1>,<eccnum2>[...]
	OK
Maximum Response Time	300ms

Parameter

<mode>	ECC number operation mode 0 Query ECC numbers 1 Add ECC numbers 2 Delete ECC numbers
<type>	ECC number type 0 ECC numbers without SIM 1 ECC numbers with SIM
<eccnum>	String type; ECC numbers (e.g.110, 119)

Example

```

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

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

OK
AT+QECCNUM=0,1 //Query the ECC numbers with SIM
+QECCNUM: 1,"911","112"

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

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

OK

```

8 Phonebook Commands

8.1. AT+CNUM Subscriber Number

AT+CNUM can get the subscribers own number(s) from the 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 error is 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 command Select TE Character Set +CSCS
<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

8.2. AT+CPBF Find Phonebook Entries

AT+CPBF can search the phonebook entries starting with the given **<findtext>** string from the current phonebook memory storage selected with +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 error is 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 +CSCS .
<index>	Integer type, 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 +CSCS .

8.3. AT+CPBR Read Phonebook Entries

AT+CPBR can return phonebook entries in location number range **<index1>... <index2>** from the current phonebook memory storage selected with **+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 error is 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, 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 +CSCS .

8.4. AT+CPBS Select Phonebook Memory Storage

AT+CPBS selects phonebook memory storage, which is used by other phonebook commands. Read command returns currently selected memory, the number of used locations and the total number of locations in the memory when supported by manufacturer. 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 error is related to ME functionality: +CME ERROR: <err>
Read Command AT+CPBS?	Response +CPBS: <storage>,<used>,<total> OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Write Command AT+CPBS=<storage>	Response OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP 27.007	

Parameter

<storage>	"SM"	SIM phonebook
	"DC"	ME dialed calls list (+CPBW may not be applicable to this storage)
	"FD"	SIM fix dialing-phone book (+CPBW operation need the authority of PIN2)
	"LD"	SIM last-dialing-phone book (+CPBW may not be applicable to this storage)
	"MC"	ME missed (unanswered) calls list (+CPBW may not be applicable to this storage)
	"ME"	Mobile equipment phonebook
	"RC"	ME received calls list (+CPBW may not be applicable to this storage)

	“EN”	SIM (or ME) emergency number (+CPBW may not be applicable to this storage)
	“ON”	SIM own numbers (MSISDNs) list
<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

8.5. AT+CPBW Write Phonebook Entry

AT+CPBW writes phonebook entry in location number **<index>** in the current phonebook memory storage selected with **+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 error is related to ME functionality: +CME ERROR: <err>
Write Command AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]	Response OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP 27.007	

Parameter

<index>	Integer type, 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 +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
```

Quectel
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9 Short Message Service Commands

9.1. AT+CSMS Select Message Service (Not Effective in CDMA Network)

AT+CSMS 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 error is 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 23.041 (the syntax of SMS AT commands is compatible with 3GPP TS 27.005 Phase 2+ version; the requirement of <service> setting 1 is mentioned under corresponding command

Command	Value	Description
<mt>		Mobile terminated messages
	0	Type not supported
	1	Type supported
<mo>		Mobile originated messages
	0	Type not supported
	1	Type supported
<bm>		Broadcast type messages
	0	Type not supported
	1	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
    
```

9.2. AT+CMGF Message Format

AT+CMGF specifies the input and output format of the short messages. **<mode>** indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages.

Mode 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 command +CSCS to inform the character set to be used in the message body in the TA-TE interface.

AT+CMGF Message Format

Test Command	Response
AT+CMGF=?	+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>	PDU mode
	1	Text mode

NOTE

AT+CMGF in CDMA network now only supports Text mode.

9.3. AT+CSCA Service Center Address (Not Effective in CDMA Network)

AT+CSCA write command updates the SMSC address when mobile originated SMS are transmitted. In text mode, the setting is used by write commands. In PDU mode, setting is used by the same commands, 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 error is 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 command +CSCS in 3GPP TS 27.007); 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
    
```

9.4. AT+CPMS Preferred Message Storage

AT+CPMS selects memory storages **<mem1>**, **<mem2>** and **<mem3>** to be used for reading, writing, etc.

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

AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	TA selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> OK If error is 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" SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<mem2>	Messages to be written and sent to this memory storage "SM" SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<mem3>	Received messages to be placed in this memory storage if routing to PC is not set ("CNMI") "SM" SIM message storage "ME" Mobile equipment message storage "MT" Same as "ME" storage
<usedx>	Integer type, number of current messages in <memx>
<totalx>	Integer type, total number of messages which can be stored in <memx>

Example

```

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

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

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

OK

9.5. AT+CMGD Delete Message

AT+CMGD deletes a short message 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 error is 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, in the range of location numbers supported by the associated memory
<delflag>	<ul style="list-style-type: none"> <u>0</u> Delete the message specified in <index> 1 Delete all read messages from <mem1> storage 2 Delete all read messages from <mem1> storage and sent mobile originated messages 3 Delete all read messages from <mem1> storage, sent and unsent mobile originated messages 4 Delete all messages from <mem1> storage

Example

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

9.6. AT+CMGL List Messages

AT+CMGL 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	Response
AT+CMGL=?	<p>+CMGL: (list of supported <stat>s)</p> <p>OK</p>
<p>Write Command</p> <p>AT+CMGL[=<stat>]</p>	<p>Response</p> <p>In Non-CDMA mode:</p> <p>If text mode (+CMGF=1) and command successful:</p> <p>For SMS-SUBMITs and/or SMS-DELIVERs:</p> <p>+CMGL:</p> <p><index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF></p> <p>+CMGL:</p> <p><index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]</p> <p>For SMS-STATUS-REPORTs:</p> <p>+CMGL:</p> <p><index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF></p> <p>+CMGL:</p> <p><index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]</p> <p>For SMS-COMMANDs:</p> <p>+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF></p>

	<p>+CMGL: <index>,<stat>,<fo>,<ct>[...]]</p> <p>For CBM storage:</p> <p>+CMGL:<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF></p> <p>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]]</p> <p>OK</p> <p>Else if PDU mode (+CMGF=0) and command successful:</p> <p>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF>< pdu><CR><LF></p> <p>+CMGL: <index>,<stat>,[alpha],<length><CR><LF><pdu>[...]]</p> <p>OK</p> <p>In CDMA Text mode:</p> <p>+CMGL: <index>,<stat>,<oa/da>,<scts>,<alpha>,<tooa/toda>,<length><CR><LF><data>[<CR><LF></p> <p>OK</p> <p>Else if error is related to ME functionality:</p> <p>+CMS ERROR: <err></p>
Execution Command AT+CMGL	Response List all messages with “REC UNREAD” status from message storage <mem1> ; then 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” “REC READ”	Received unread messages Received read messages
---------------------	---	--

	“STO UNSENT”	Stored unsend messages
	“STO SENT”	Stored send messages
	“ALL”	All messages
	In PDU mode:	
	0	Received unread messages
	1	Received read messages
	2	Stored unsend messages
	3	Stored send messages
	4	All messages
<index>	Integer type, 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 command +CSCS in 3GPP TS 27.007); 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 command +CSCS in TS 27.007); 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 command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007).	
<scts>	Service center time stamp. 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (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 (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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: <ul style="list-style-type: none"> - 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 command Select TE Character Set +CSCS in 3GPP TS 27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A. - 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 II (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 **<dc>**, indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used:
- If TE character set other than "HEX" (refer to command +CSCS in 3GPP TS27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A.
- 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 **<dc>**, indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.

<pdu>

In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))3GPP TS 27.007.

NOTE

AT+CMGL in CDMA network now only supports Text mode.

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
```

9.7. AT+CMGR Read Message

AT+CMGR 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>	<p>Response</p> <p>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".</p> <p>In Non-CDMA mode: If text mode (+CMGF=1) and command is executed successfully: For SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],[<scts>],[<tooa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p> <p>For SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcsc>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p> <p>For SMS-STATUS-REPORTs: +CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],[<scts>,<dt>,<st></p> <p>OK</p> <p>For SMS-COMMANDs: +CMGR: <stat>,<fo>,<ct>,[<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]</p> <p>OK</p> <p>For CBM storage: +CMGR: <stat>,<sn>,<mid>,<dcsc>,<page>,<pages><CR><LF><data></p>

	<p>OK</p> <p>If PDU mode (+CMGF=0) and command successful: +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu></p> <p>OK</p> <p>In CDMA Text mode: +CMGR: <stat>,<oa/da>,<scts>,<alpha>,<tooa/toda>,<lang>,<fmt> ,<length>,<prt>,<prv>,<type><CR><LF><data></p> <p>OK</p> <p>If error is related to ME functionality: +CMS ERROR: <err></p>
Maximum Response Time	Depends on the length of message content.
Reference	3GPP TS 27.005

Parameter

<index>	Integer type, in the range of location numbers supported by the associated memory																								
<stat>	<table border="0"> <thead> <tr> <th>Text mode</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>"REC UNREAD"</td> <td>Received unread messages</td> </tr> <tr> <td>"REC READ"</td> <td>Received read messages</td> </tr> <tr> <td>"STO UNSENT"</td> <td>Stored unsent messages</td> </tr> <tr> <td>"STO SENT"</td> <td>Stored sent messages</td> </tr> <tr> <td>"ALL"</td> <td>All messages</td> </tr> <tr> <th>PDU mode</th> <th>Explanation</th> </tr> <tr> <td>0</td> <td>Received unread messages</td> </tr> <tr> <td>1</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>Stored unsent messages</td> </tr> <tr> <td>3</td> <td>Stored sent messages</td> </tr> <tr> <td>4</td> <td>All messages</td> </tr> </tbody> </table>	Text mode	Explanation	"REC UNREAD"	Received unread messages	"REC READ"	Received read messages	"STO UNSENT"	Stored unsent messages	"STO SENT"	Stored sent messages	"ALL"	All messages	PDU mode	Explanation	0	Received unread messages	1	Received read messages	2	Stored unsent messages	3	Stored sent messages	4	All messages
Text mode	Explanation																								
"REC UNREAD"	Received unread messages																								
"REC READ"	Received read messages																								
"STO UNSENT"	Stored unsent messages																								
"STO SENT"	Stored sent messages																								
"ALL"	All messages																								
PDU mode	Explanation																								
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 command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007).																								
<da>	Destination address. 3GPP TS 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS in																								

	3GPP TS 27.007); 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 command +CSCS in TS 27.007); 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, parameter can be omitted.
<pid>	Protocol identifier. 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).
<dc>	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 command AT+CSCS .); type of address 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 command +CSCS in 3GPP TS 27.007); 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 (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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 14.8 SMS Character Sets Conversions for the detail.
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA

	character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))3GPP TS 27.007.
<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

NOTE

AT+CMGR in CDMA network now only supports Text mode.

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",,"13/12/13,15:06:37+32",145,4,0,0,"+861380021050
0",145,27
```

<This is a test from Quectel>

OK

9.8. AT+CMGS Send Message

AT+CMGS 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 (+CMGF=1): AT+CMGS=<da>[,<tda>]<CR> text is entered <ctrl-Z/ESC> ESC quits without sending 2) If PDU mode (+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 +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 text mode (+CMGF=1) and sent successfully: +CMGS: <mr> OK If PDU mode (+CMGF=0) and sent successfully: +CMGS: <mr> OK If error is 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 command +CSCS in 3GPP TS 27.007); 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 (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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.

NOTE

AT+CMGS in CDMA network now only supports Text mode.

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, <CTRL+Z> send message, <ESC> quits
without sending
+CMGS: 247
OK
    
```

9.9. AT+CMMS More Messages to Send (Not Effective in CDMA Network)

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

AT+CMMS More Messages to Send

Test Command	Response
AT+CMMS=?	+CMMS: (list of supported<n>s)

	OK
Read Command AT+CMMS?	Response +CMMS: <n>
Write Command AT+CMMS=<n>	Response OK ERROR If error is 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 (**+CMGS**, **+CMSS**, etc.) and the next send command exceeds 1-5 seconds (the exact value is up to ME implementation); 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)

NOTES

1. AT+CMMS is not effective in CDMA network.
2. After the use of read command, a delay of 5-10 seconds is required before issuing the write command; otherwise the "+CMS ERROR: 500" may appear.

9.10. AT+CMGW Write Message to Memory

AT+CMGW write and execution commands store a short message from TE to memory storage **<mem2>**. 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 the write command **+CMGS**.

AT+CMGW Write Message to Memory

Test Command AT+CMGW=?	Response OK
Write Command 1) If text mode (+CMGF=1): AT+CMGW=<oa/da>[,<tooa/toda>[,<stat>]]<CR> text is entered <ctrl-Z/ESC> <ESC> quits without sending 2) If PDU mode (+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>. Memory location <index> of the stored message is returned. By default 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 error is 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 command +CSCS in 3GPP TS 27.007); 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 command +CSCS in TS 27.007); 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 (+CMGF=1) the length of the		

	message body <data> (or <cdata>) in characters; or in PDU mode (+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> .

NOTE

AT+CMGW in CDMA network now only supports Text mode.

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, <CTRL+Z> write message, <ESC> quits
                                without sending
+CMGW: 4

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

OK

```

9.11. AT+CMSS Send Message from Storage

AT+CMSS write command sends message with location value **<index>** from message storage **<mem2>** to the network. If 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. 1) If text mode (+CMGF=1) and sent successfully: +CMSS: <mr>[,<scts>] OK 2) If PDU mode (+CMGF=0) and sent successfully: +CMSS: <mr> [,<ackpdu>] OK 3) If error is related to ME functionality: +CMS ERROR: <err>
Maximum Response Time	120s, determined by network.
Reference 3GPP TS 27.005	

Parameter

<index>	Integer type, 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 command +CSCS in 3GPP TS 27.007); 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>	Format is same for <pdu> in case of SMS, but without 3GPP TS 24.011 SC address field and 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, <CTRL+Z> send message, <ESC> quits
without sending
+CMGW: 4
OK
AT+CMSS=4 //Send the message of index 4 from memory storage.
+CMSS: 54
OK
    
```

9.12. AT+CNMA New Message Acknowledgement to UE/TE (Not Effective in CDMA Network)

AT+CNMA write and execute 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 (net-work 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 error is related to ME functionality: +CMS ERROR: <err>
Write Command AT+CNMA=<n>	Response OK ERROR If error is 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

NOTES

1. AT+CNMA is not effective in CDMA network.
2. Execute 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
OK
AT+CNMI=1,2,0,0,0
OK
+CMT: "+8615021012496", "13/03/18,17:07:21+32",145,4,0,0,"+8613800551500",145,28
This is a test from Quectel.           //Short message is outputted directly when SMS is incoming.
AT+CNMA                               //Send ACK to the network
OK
AT+CNMA
+CMS ERROR: 340                       //The second time return error; it needs ACK only once

```

9.13. AT+CNMI SMS Event Reporting Configuration

AT+CNMI 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 signal is ON. If TE is inactive (e.g. DTR signal is 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 signal is ON. If TE is inactive (e.g. DTR signal is OFF), message receiving should be done as specified in 3GPP TS 23.038. OK ERROR If error is 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 on-line 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 3G PPTS 23.038) and preferred memory storage (+CPMS) setting; and the value is:
	0	No SMS-DELIVER indications are routed to the TE.

- 1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE by using unsolicited result code: **+CMTI: <mem>,<index>**
 - 2 SMS-DELIVERs (except class 2) are routed directly to the TE using unsolicited result code: **+CMT: [<alpha>],<length><CR><LF><pdu>** (PDU mode enabled) or **+CMT:<oa>,<alpha>,<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** (Text mode enabled; about parameters in italics, refer to Command Show Text Mode Parameters **+CSDH**) or **^HCMT:<oa>,<scts>,<lang>,<fmt>,<length>,<prt>,<prv>,<type>,<stat><CR><LF><data>**(Text mode for CDMA SMS). Class 2 messages result in indication as defined in **<mt>=1**.
 - 3 Class 3 SMS-DELIVERs are routed directly to TE by using unsolicited result codes defined in **<mt>=2**. Messages of other classes result in indication as defined in **<mt>=1**.
- <bm>** The rules for storing received CBMs depend on its data coding scheme (refer to 3 GPP TS 23.038) and the setting of Select CBM Types (**+CSCB**); and the value is:
- 0 No CBM indications are routed to the TE.
 - 2 New CBMs are routed directly to the TE using unsolicited result code: **+CBM: <length><CR><LF><pdu>** (PDU mode); or **+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** (text mode)
- <ds>**
- 0 No SMS-STATUS-REPORTs are routed to the TE.
 - 1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: **+CDS: <length><CR><LF><pdu>** (PDU mode) or **+CDS: <fo>,<mr>,<ra>,<tora>,<scts>,<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>**
- 0 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 new message has been received
+CMT: [<alpha>],<length><CR><LF><pdu>	Short message is outputted directly
+CBM: <length><CR><LF><pdu>	Cell broadcast message is outputted directly

Example

```
AT+CMGF=1 //Set SMS message format as text mode
OK
AT+CSCS="GSM" //Set character set as GSM which is used by the TE
```

```

OK
AT+CNMI=1,2,0,1,0 //Set SMS-DELIVERs are routed directly to the TE
OK
+CMT: "+8615021012496", "13/03/18,17:07:21+32",145,4,0,0,"+8613800551500",145,28
This is a test from Quectel. //Short message is outputted directly when SMS is incoming.
    
```

9.14. AT+CSCB Select Cell Broadcast Message Types (Not Effective in CDMA Network)

AT+CSCB 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 error is 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>) (default is empty string), e.g. "0,1,5,320-478,922"	
<dcss>	String type, all different possible combinations of CBM data coding schemes (refer to	

<dc> (default is empty string), e.g. "0-3,5"

9.15. AT+CSDH Show SMS Text Mode Parameters (Not Effective in CDMA Network)

AT+CSDH 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>, <dc>) and <length>, <toda> or <toa> in +CMT , +CMGL , +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode
	1	Show the values in result codes

Example

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

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

9.16. AT+CSMP Set SMS Text Mode Parameters (Not Effective in CDMA Network)

AT+CSMP 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>,<dc> OK
Write Command AT+CSMP=<fo>[,<vp>[,<pid>[,<dc>]]]	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 (+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 can be omitted.
<vp>	Validity period. Depending on SMS-SUBMIT <fo> setting: 3GPP TS 23.040

	TP-Validity-Period either in integer format or in time-string format (refer to <dt>).
<pid>	Protocol identifier. 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).
<dcs>	Data coding scheme. Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.

9.17. AT+QCMGS Send Concatenated Messages

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

AT+QCMGS Send Concatenated Messages

Test Command AT+QCMGS=?	Response OK
Write Command If text mode (+CMGF=1): AT+QCMGS=<da>[,<toda>][,<uid>,<msg_seg>,<msg_total>]<CR> text is entered <ctrl-Z/ESC>	Response If text mode (+CMGF=1) and sent successfully: +QCMGS: <mr> OK ERROR If error is 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 from 0 to 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 from 0 to 7. <msg_seg>=0 means: ignore the value and regarded it as a non-concatenated message.
<msg_total>	The total number of the segments of one concatenated message. Range from 0 to 7. <msg_total>=0 or 1 means: ignore the value and regard it as a non-concatenated message.
<da>,<toda>,<mr>	Please refer to AT+CMGS

NOTES

- 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 $(140 \text{ octets} - 6) * 8 / 7 = 153$ 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 $140 - 6 = 134$.
- <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 the SMS-DELIVER received from SC duplicate or not. **<uid>**, the field of UDH, 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.
- 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 <CR> //Input 120 for <uid>, send the first segment of the
concatenated SMS

>ABCD<Ctrl-Z>
+QCMGS: 190

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

OK
    
```

9.18. AT+QCMGR Read Concatenated Messages

The function of AT+QCMGR 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. You should concatenate several segments 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>	<p>Response</p> <p>If text mode (+CMGF=1) and command is executed successfully:</p> <p>For SMS-DELIVER:</p> <p>+QCMGR: <stat>,<oa>,[<alpha>],[<scts>],[<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>] <CR><LF><data></p> <p>OK</p> <p>For SMS-SUBMIT:</p> <p>+QCMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>][,<uid>,<msg_seg>,<msg_total>] <CR><LF><data></p> <p>OK</p> <p>For SMS-STATUS-REPORTs:</p> <p>+QCMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],[<scts>,<dt>,<st>]</p> <p>OK</p> <p>For SMS-COMMANDs:</p> <p>+QCMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><cdata>]</p> <p>OK</p> <p>Else, if error is related to ME functionality:</p> <p>+CMS ERROR: <err></p>
Maximum Response Time	Depends on the length of message content.

Parameter

<uid>	Message identification in the user data header (UDH). Range from 0 to 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 from 1 to 7.
<msg_total>	The total number of the segments of one concatenated message. Range is from 2 to 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 bits or 16 bits **<uid>**. So its maximal value is 255 with 8 bits and 65535 with 16 bits.
2. If the message to be read is not a concatenated message, **<uid>**, **<msg_seg>** and **<msg_total>** would not be showed in the result.

Example

```
+CMTI: "SM",3           //The first message of a concatenated message comes
+CMTI: "SM",4           //The second message of a concatenated message comes

AT+QCMGR= 3             //Read the first segment of the concatenated message
+QCMGR: "REC UNREAD","+8615056913384",,"13/07/30,14:44:37+32",120,1,2
ABCD

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

OK
```

9.19. AT+QCSMP Set CDMA SMS Text Mode Parameters

AT+QCSMP 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+QCSMP Set CDMA SMS Text Mode Parameters

Test Command	Response
AT+QCSMP=?	OK
Read Command AT+QCSMP?	Response +CSMP: <ack>,<prt>,<fmt>,<prv>,<lang> OK

Write Command AT+QCSMP=<ack>,<prt>,<fmt>,<prv> ,<lang>	Response OK
Maximum Response Time	300ms

Parameter

<ack>	Status Report. <u>0</u> Not need status report 1 Need status report
<prt>	Priority <u>0</u> Normal 1 Interactive 2 Urgent 3 Emergency
<fmt>	Format 0 GSM 7 bit <u>1</u> ASCII 6 UNICODE
<prv>	Privacy <u>0</u> Normal 1 Restricted 2 Confidential 3 Secret
<lang>	Language <u>0</u> Unspecified 1 English 2 French 3 Spanish 4 Japanese 5 Korean 6 Chinese 7 Hebrew

9.20. AT+QSMSR Read Message

AT+QSMSR 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+QSMSR Read Message

Test Command AT+QSMSR=?	Response OK
Write Command AT+QSMSR=<index>	<p>Response</p> <p>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".</p> <p>In Non-CDMA mode: If text mode (+CMGF=1) and command is executed successfully: For SMS-DELIVER: +QSMSR: <smstype>,<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p> <p>For SMS-SUBMIT: +QSMSR: <smstype>,<stat>,<da>,[<alpha>],[<toda>,<fo>,<pid>,<dc>,<s>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p> <p>For SMS-STATUS-REPORTs: +QSMSR: <smstype>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st></p> <p>OK</p> <p>For SMS-COMMANDs: +QSMSR: <smstype>,<stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR><LF><cdata>]</p> <p>OK</p> <p>For CBM storage: +QSMSR: <smstype>,<stat>,<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data></p>

	<p>OK</p> <p>If PDU mode (+CMGF=0) and command successful: +QSMSR: <smstype>, <stat>,[<alpha>],<length><CR><LF><pdu></p> <p>OK</p> <p>In CDMA Text mode: +QSMSR: <smstype>,<stat>,<oa/da>,<scts>,<alpha>,<tooa/toda>,<lang>,<fmt>,<length>,<prt>,<prv>,<type><CR><LF><data> ></p> <p>OK</p> <p>If error is related to ME functionality: +CMS ERROR: <err></p>
Maximum Response Time	Depends on the length of message content.

Parameter

<smstype>	SMS type 0 CDMA SMS 1 Non-CDMA SMS																		
<index>	Integer type, in the range of location numbers supported by the associated memory																		
<stat>	<table border="1"> <thead> <tr> <th>PDU mode</th> <th>Text mode</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>"REC UNREAD"</td> <td>Received unread messages</td> </tr> <tr> <td>1</td> <td>"REC READ"</td> <td>Received read messages</td> </tr> <tr> <td>2</td> <td>"STO UNSENT"</td> <td>Stored unsent messages</td> </tr> <tr> <td>3</td> <td>"STO SENT"</td> <td>Stored sent messages</td> </tr> <tr> <td>4</td> <td>"ALL"</td> <td>All messages</td> </tr> </tbody> </table>	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
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																	
<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 command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007).																		
<da>	Destination address. 3GPP TS 23.040 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command +CSCS in 3GPP TS 27.007); 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 command +CSCS in TS 27.007); 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, 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 command AT+CSCS .); type of address 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 command +CSCS in 3GPP TS 27.007); 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 (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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 to 14.8 SMS Character Sets Conversions for the detail.
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))3GPP TS 27.007.

<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

NOTE

AT+QSMSR in CDMA network now only supports Text mode.

9.21. AT+QSMSL List Messages

AT+QSMSL 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+QSMSL** without status value **<stat>**, it will report the list of SMS with "REC UNREAD" status.

AT+QSMSL List Messages

<p>Test Command AT+QSMSL=?</p>	<p>Response +QSMSL: (list of supported <stat>s)</p> <p>OK</p>
<p>Write Command AT+QSMSL[=<stat>]</p>	<p>Response</p> <p>In Non-CDMA mode: If text mode (+CMGF=1) and command successful: For SMS-SUBMITs and/or SMS-DELIVERs: +QSMSL: <smstype>,<index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<ct ooa/toda>,<length>]<CR><LF><data>[<CR><LF> +QSMSL: <smstype>,<index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<ct ooa/toda>,<length>]<CR><LF><data>[...]]</p> <p>For SMS-STATUS-REPORTs: +QSMSL: <smstype>,<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<sct s>,<dt>,<st>[<CR><LF> +QSMSL: <smstype>,<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<sct s>,<dt>,<st>[...]]</p> <p>For SMS-COMMANDs: +QSMSL: <smstype>,<index>,<stat>,<fo>,<ct>[<CR><LF> +QSMSL: <smstype>,<index>,<stat>,<fo>,<ct>[...]]</p> <p>For CBM storage: +QSMSL: <smstype>,<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF> +QSMSL: <smstype>,<index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[...]]</p> <p>OK</p> <p>Else if PDU mode (+CMGF=0) and command successful: +QSMSL: <smstype>,<index>,<stat>,[<alpha>],<length><CR><LF><pdu><CR><LF> +QSMSL:</p>

	<p><smstype>,<index>,<stat>,[alpha],<length><CR><LF>< pdu>[...]]</p> <p>OK</p> <p>In CDMA Text mode: +QSMSL: <smstype>,<index>,<stat>,<oa/da>,<scts>,<alpha>,<tooa /toda>,<length><CR><LF><data>[<CR><LF>]</p> <p>OK</p> <p>Else if error is related to ME functionality: +CMS ERROR: <err></p>
Execution Command AT+QSMSL	<p>Response</p> <p>List all messages with “REC UNREAD” status from message storage <mem1>; then the status in the storage changes to “REC READ”.</p>
Maximum Response Time	<p>300ms.</p> <p>Note: Operation of <stat> depends on the storage of listed messages.</p>

Parameter

<smstype>	SMS type	
	0	CDMA SMS
	1	Non-CDMA SMS
<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, 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 command	

	+CSCS in 3GPP TS 27.007); 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 command +CSCS in TS 27.007); 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 command Select TE Character Set +CSCS (see definition of this command in 3GPP TS 27.007).
<scts>	Service center time stamp. 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (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 (+CMGF=1) the length of the message body <data> (or <cdata>) in characters; or in PDU mode (+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: <ul style="list-style-type: none"> - 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 command Select TE Character Set +CSCS in 3GPP TS 27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A. - 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 II (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)). <p>In the case of CBS: 3GPP TS 23.041 CBM Content of Message in text mode responses; format:</p> <ul style="list-style-type: none"> - If <dcs>, indicates that 3GPP TS 23.038 GSM 7 bit default alphabet is used: - If TE character set other than "HEX" (refer to command +CSCS in 3GPP TS 27.007): ME/TA converts GSM alphabet into current TE character set according to rules of Annex A. - If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal number. - If <dcs>, indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number.
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU

in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))3GPP TS 27.007.

NOTE

AT+QSMSL in CDMA network now only supports Text mode.

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10 Packet Domain Commands

10.1. AT+CGATT Attachment or Detachment of PS

The AT+CGATT 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 error is 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
    
```

10.2. AT+CGDCONT Define PDP Context

AT+CGDCONT 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 AT+CGDCONT 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) 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>]]]]]	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" IPV4 "PPP" "IPV6" "IPV4V6"
<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 +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

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

AT+CGQREQ 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 error is 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 +CGDCONT command)
<PDP_type>	Packet Data Protocol type "IP" Internet Protocol (IETF STD 5) "PPP" "IPV6" "IPV4V6"
<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 5: Delay Class.
	<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 5: Delay Class

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

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

AT+CGQMIN 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 AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]	Response OK If error is 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 +CGDCONT command)
<PDP_type>	Packet Data Protocol type "IP" Internet Protocol (IETF STD 5) "PPP" "IPV6" "IPV4V6"
<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 5: Delay Class <u>Q</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

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

AT+CGEQREQ 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>]
[...]

	<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. T+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 $5 \cdot 10^{-3}$ would be specified as "5E3" (e.g. AT+CGEQREQ=..., "5E3", ...).	
	<u>0E0</u>	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 [8] subclause 10.5.6.5).	
	0	No
	1	Yes
	2	No detect
	<u>3</u>	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).	
	<u>0</u>	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 [8] subclause 10.5.6.5).	
	<u>0</u>	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

<Signalling Indication>	1	Characteristics of SDUs correspond to a speech source
	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 <PDP_type>

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

AT+CGEQMIN 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+CEGQMIN 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> ,

	bearer service is optimized (refer to 3GPP TS 24.008 subclause 10.5.6.5). If the traffic class 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. T+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 $5 \cdot 10^{-3}$ 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 $5 \cdot 10^{-3}$ 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 [8] 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 [8] 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 <PDP_type>

10.7. AT+CGACT Activate or Deactivate PDP Context

The AT+CGACT 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 error is 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 +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
```

10.8. AT+CGDATA Enter Data State

The AT+CGDATA write command causes the MT to perform whatever actions that are necessary to establish communication between the TE and the network using one or more packet domain PDP types. This may include performing a PS attach and one or more PDP context activations. Commands following the AT+CGDATA 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 error is 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 +CGDCONT command)

10.9. AT+CGPADDR Show PDP Address

The AT+CGPADDR 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 +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 the +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
    
```

10.10. AT+CGCLASS GPRS Mobile Station Class

AT+CGCLASS 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 error is 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
----------------------	---

10.11. AT+CGREG Network Registration Status

The AT+CGREG 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>	<u>0</u>	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; 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 bytes location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>		String type, two byte 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",2

```

10.12. AT+CGEREP Packet Domain Event Reporting

Set 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
Execution Command AT+CGEREP	Response OK
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<mode>	<u>0</u>	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>	<u>0</u>	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
```

10.13. AT+CGSMS Select Service for MO SMS Messages

AT+CGSMS 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 error is 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
1	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.

10.14. AT+CEREG EPS Network Registration Status

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

AT+CEREG EPS Network Registration Status	
Test Command AT+CEREG=?	Response +CEREG: (list of supported <n>s) OK
Read Command AT+ CEREG?	Response +CEREG: <n>,<stat>[,<tac>,<ci>[,<Act>]] OK
Write Command AT+ CEREG[=<n>]	Response OK 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, four byte 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

10.15. AT+QGDCNT Packet Data Counter

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

AT+QGDCNT Packet Data Counter

Test Command AT+QGDCNT=?	Response +QGDCNT: (0,1) OK
Read Command AT+QGDCNT?	Response +QGDCNT: <bytes_sent>,<bytes_rcv> OK
Write Command AT+QGDCNT=<op>	Response OK ERROR If error is 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 intend to auto save results please refer to command AT+QAUGDCNT.
<bytes_sent>	A numeric parameter. The amount of sent bytes.
<bytes_rcv>	A numeric parameter. The amount of received bytes.

NOTE

When module is powered on, <bytes_sent> and <bytes_rcv> 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 <bytes_rcv>
+QGDCNT: 3832,4618

OK

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

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

10.16. AT+QAUGDCNT Auto Save Packet Data Counter

This command allows command (AT+QGDCNT) 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 error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms

Parameter

<value> A numeric parameter. Default value is 0. <value> is the time-interval for command (AT+QGDCNT) to save results to NV automatically. If <value> 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
```

11 Supplementary Service Commands

11.1. AT+CCFC Call Forwarding Number and Conditions Control

AT+CCFC allows control of the call forwarding supplementary service according to 3GPP TS 22.082. Registration, erasure, activation, deactivation and status query are supported.

AT+CCFC Call Forwarding Number and Conditions Control

Test Command

AT+CCFC=?

Response

+CCFC: (list of supported <reads>s)

OK

Write Command

AT+CCFC=<reads>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]

Response

TA controls the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Only ,<reads> and <mode> should be entered with mode (0-2,4)

If <mode><>2 and command successful:

OK

If <mode>=2 and command successful (only in connection with <reads> 0 –3):

For registered call forwarding numbers:

+CCFC:

<status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [

OK

If no call forwarding numbers are registered (and therefore all classes are inactive):

+CCFC: <status>,<class>

OK

where <status>=0 and <class>=15

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

Parameter

<reads>	0	Unconditional
	1	Mobile busy
	2	No reply
	3	Not reachable
	4	All call forwarding (0-3)
	5	All conditional call forwarding (1-3)
<mode>	0	Disable
	1	Enable
	2	Query status
	3	Registration
	4	Erasure
<number>	Phone number in string type of forwarding address in format specified by <type>	
<type>	Type of address in integer format; default value is 145 when dialing string includes international access code character "+"; otherwise 129	
<subaddr>	String type sub-address of format specified by <satype>	
<satype>	Type of sub-address in integer	
<class>	1	Voice
	2	Data
	4	FAX
	7	All telephony except SMS
	8	Short message service
	16	Data circuit sync
	32	Data circuit async
<time>	1...30	When "no reply" (<reads> =no reply) is enabled or queried, this gives the time in seconds to wait before call is forwarded; default value is 20
<status>	0	Not active
	1	Active

Example

```
AT+CCFC=0,3,"15021012496" //Register the destination number for unconditional call forwarding (CFU)

OK
AT+CCFC=0,2 //Query the status of CFU without specifying <class>
+CFC: 1,1,"+8615021012496",145,,,
```

```

OK
AT+CCFC=0,4           //Erase the registered CFU destination number
OK
AT+CCFC=0,2           //Query the status, no destination number
+CCFC: 0,255
OK
    
```

11.2. AT+CCWA Call Waiting Control

The AT+CCWA command allows control of the call waiting supplementary service according to 3GPP TS 22.083. Activation, deactivation and status query are supported.

AT+CCWA Call Waiting Control

Test Command AT+CCWA=?	Response +CCWA: (list of supported <n>s) OK
Read Command AT+CCWA?	Response +CCWA: <n> OK
Write Command AT+CCWA[=<n>][,<mode>[,<class>]]	Response TA controls the call waiting supplementary service. Activation, deactivation and status query are supported. If <mode><>2 and command successful: OK If <mode>=2 and command successful: +CCWA: <status>,<class1>[<CR><LF>+CCWA:<status>,<class2>[..]] OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<n>	0	Disable presentation of an unsolicited result code
	1	Enable presentation of an unsolicited result code
<mode>	When <mode> parameter is not given, network is not interrogated	
	0	Disable
	1	Enable
	2	Query status
<class>	A sum of integers, each integer represents a class of information	
	1	Voice (telephony)
	2	Data (bearer service)
	4	FAX (facsimile)
	16	Data circuit sync
	32	Data circuit async
<status>	0	Disable
	1	Enable
<number>	Phone number in string type of calling address in format specified by <type>	
<type>	Type of address octet in integer format	
	129	Unknown type (ISDN format number)
	145	International number type (ISDN format)
<alpha>	Optional string type alphanumeric representation of <number> corresponding to the entry found in phone book	

NOTES

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

Example

```

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

```

11.3. AT+CHLD Call Related Supplementary Services

The AT+CHLD command allows the control of the following call related services:

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

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

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

AT+CHLD Call Related Supplementary Services

Test Command AT+CHLD=?	Response +CHLD: (list of supported <n>s) OK
Write Command AT+CHLD[=<n>]	Response TA controls the supplementary services call hold, multiparty and explicit call transfer. Calls can be put on hold, recovered, released, added to conversation and transferred. OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<n>	0	Terminate all held calls or UDUB (User Determined User Busy) for a waiting call. If a call is waiting, terminate the waiting call. Otherwise, terminate all held calls (if any)
	1	Terminate all active calls (if any) and accept the other call (waiting call or held call).

1X	Terminate the specific call number X (X=1-7)
<u>2</u>	Place all active calls on hold (if any) and accept the other call (waiting call or held call) as the active call
2X	Place all active calls except call X (X=1-7) on hold
3	Add the held call to the active calls
4	Connects the two calls and disconnects the subscriber from both calls (ECT)

Example

```

ATD10086; //Establish a call
OK

+CCWA: "02154450293",129,1 //Indication of a call that has been waiting
AT+CHLD=2 //Place the active call on hold and accept the waiting call as
the active call

OK
AT+CLCC
+CLCC: 1,0,1,0,0,"10086",129 //The first call on hold

+CLCC: 2,1,0,0,0,"02154450293",129 //The second call be active

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

+CLCC: 2,1,1,0,1,"02154450293",129 //The second call on hold

OK
AT+CHLD=3 //Add a held call to the active calls in order to set up a
conference (multiparty) call

OK
AT+CLCC
+CLCC: 1,0,0,0,1,"10086",129

+CLCC: 2,1,0,0,1,"02154450293",129

OK

```

11.4. AT+CLIP Calling Line Identification Presentation

AT+CLIP refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

AT+CLIP Calling Line Identification Presentation

Test Command AT+CLIP=?	Response +CLIP: (list of supported <n>s) OK
Read Command AT+CLIP?	Response +CLIP: <n>,<m> OK
Write Command AT+CLIP=<n>	Response TA enables or disables the presentation of the calling line identity (CLI) at the TE. It has no effect on the execution of the supplementary service CLIP in the network. OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	15s, determined by network.
Reference	3GPP TS 27.007

Parameter

<n>	0	Suppress unsolicited result codes
	1	Display unsolicited result codes
<m>	0	CLIP not provisioned
	1	CLIP provisioned
	2	Unknown
<number>	Phone number in string type of calling address in format specified by <type>	
<subaddr>	String type subaddress of format specified by <satype>	
<satype>	Type of subaddress octet in integer format (refer to 3GPP TS 24.008 [8] subclause 10.5.4.8)	
<type>	Type of address octet in integer format;	
	129	Unknown type (ISDN format)
	145	International number type (ISDN format)
	161	National number

<alpha>	String type alphanumeric representation of <number> corresponding to the entry found in phone book	
<CLI validity>	0	CLI valid
	1	CLI has been withheld by the originator
	2	CLI is not available due to interworking problems or limitations of originating network

NOTE

Unsolicited result code:
When the presentation of the CLIP at the TE is enabled (and calling subscriber allows), an unsolicited result code is returned after every RING (or **+CRING: <type>**) at a mobile terminating call:
+CLIP: <number>,<type>,[subaddr],[satype],[<alpha>],<CLI validity>

Example

```
AT+CPBW=1,"02151082965",129,"QUECTEL"
OK
AT+CLIP=1
OK

RING

+CLIP: "02151082965",129,,,"QUECTEL",0
```

11.5. AT+CLIR Calling Line Identification Restriction

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

AT+CLIR Calling Line Identification Restriction

Test Command AT+CLIR=?	Response +CLIR: (list of supported <n>s) OK
Read Command AT+CLIR?	Response +CLIR: <n>,<m> OK

Write Command AT+CLIR[=<n>]	Response TA restricts or enables the presentation of the calling line identity (CLI) to the called party when originating a call. The command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite Command. OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	15s, determined by network.
Reference 3GPP TS 27.007	

Parameter

<n>	Parameter sets the adjustment for outgoing calls 0 Presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression
<m>	Parameter shows the subscriber CLIR service status in the network 0 CLIR not provisioned 1 CLIR provisioned in permanent mode 2 Unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed

11.6. AT+COLP Connected Line Identification Presentation

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

AT+COLP Connected Line Identification Presentation

Test Command AT+COLP=?	Response +COLP: (list of supported <n>s) OK
----------------------------------	---

Read Command AT+COLP?	Response +COLP: <n>,<m> OK
Write Command AT+COLP[=<n>]	Response TA enables or disables the presentation of the COL (Connected Line) at the TE for a mobile originating a call. It has no effect on the execution of the supplementary service COLR in the network. Intermediate result code is returned from TA to TE before any +CR or V.25ter responses. OK
Maximum Response Time	15s, determined by network.
Reference 3GPP TS 27.007	

Parameter

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

NOTE

Intermediate result code:
When enabled (and called subscriber allows), an intermediate result code is returned before any +CR or V.25ter responses:
+COLP: <number>,<type>,[<subaddr>],[<satype>],[<alpha>]

Example

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

11.7. AT+CSSN Supplementary Service Notifications

AT+CSSN refers to supplementary service related network initiated notifications. The write command enables/disables the presentation of notification result codes from TA to TE.

AT+CSSN Supplementary Service Notifications	
Test Command AT+CSSN=?	Response +CSSN: (list of supported <n>s),(list of supported <m>s) OK
Read Command AT+CSSN?	Response +CSSN: <n>,<m> OK
Write Command AT+CSSN=<n>[,<m>]	Response OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<n>	Integer type, parameter sets/shows the +CSSI intermediate result code presentation status to the TE
0	Disable
1	Enable

<m>	Integer type (parameter sets/shows the +CSSU unsolicited result code presentation status to the TE) 0 Disable 1 Enable
<code1>	Integer type, it is manufacturer specific, which of these codes are supported 0 Unconditional call forwarding is active 1 Some of the conditional call forwardings are active 2 Call has been forwarded 3 Waiting call is pending 5 Outgoing call is barred
<code2>	Integer type, it is manufacturer specific, which of these codes are supported 0 The incoming call is a forwarded call 2 Call has been put on hold (during a voice call) 3 Call has been retrieved (during a voice call) 5 Held call was terminated by another party 10 Additional incoming call forwarded

NOTES

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

11.8. AT+CUSD Unstructured Supplementary Service Data

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

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

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

AT+CUSD Unstructured Supplementary Service Data

Test Command AT+CUSD=?	Response +CUSD: (list of supported <mode> s) OK
Read Command AT+CUSD?	Response +CUSD: <mode> OK
Write Command AT+CUSD[=<mode>[,<reqstr>[,<dcs>]]]	Response OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	120s, determined by network.
Reference 3GPP TS 27.007	

Parameter

<mode>	Integer type, sets/shows the result code presentation status to the TE <u>0</u> Disable the result code presentation to the TE 1 Enable the result code presentation to the TE 2 Cancel session(not applicable to read command response)
<reqstr>	Unstructured Supplementary Service Data (USSD) to be sent to the network. If this parameter is not given, network is not interrogated.
<rspstr>	Unstructured Supplementary Service Data (USSD) received from the network
<dcs>	Integer type, 3GPP TS 23.038 Cell Broadcast Data Coding Scheme (default 15)
<status>	USSD response from the network or the network initiated operation 0 No further user action required (network initiated USSD Notify, or no further information needed after mobile initiated operation) 1 Further user action required (network initiated USSD Request, or further information needed after mobile initiated operation) 2 USSD terminated by network 3 Another local client has responded 4 Operation not supported 5 Network time out

12 Audio Commands

12.1. AT+CLVL Loud Speaker Volume Level

AT+CLVL is used to select the volume of the internal loudspeaker of the MT.

AT+CLVL Loud Speaker Volume Level

Test Command AT+CLVL=?	Response +CLVL: (list of supported<level>s) OK
Read Command AT+CLVL?	Response +CLVL: <level> OK
Write Command AT+CLVL=<level>	Response OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<level>	Integer type value (0-3-5) with manufacturer specific range (Smallest value represents the lowest sound level)
---------	--

NOTE

This parameter will not be saved.

12.2. AT+CMUT Mute Control

AT+CMUT is used to enable/disable the uplink voice muting during a voice call.

AT+CMUT Mute Control

Test Command AT+CMUT=?	Response +CMUT: (list of supported<n>s) OK
Read Command AT+CMUT?	Response +CMUT: <n> OK
Write Command AT+CMUT=<n>	Response OK If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<n>	<u>0</u>	Mute off
	1	Mute on

NOTE

This parameter will not be saved.

12.3. AT+QAUDLOOP Enable Audio Loop Test

This command is used to enable audio loop test.

AT+QAUDLOOP Enable Audio Loop Test

Test Command AT+QAUDLOOP=?	Response +QAUDLOOP: (0,1),(0-2)
--------------------------------------	---

	OK
Read Command AT+QAUDLOOP?	Response +QAUDLOOP: <enable>
	OK
Set Command AT+QAUDLOOP=<enable>[,<path>]	Response OK ERROR
Maximum Response Time	300ms

Parameter

<enable>	Numeric type; to enable or disable audio loop test
0	Disable audio loop test
1	Enable audio loop test

NOTE

This parameter will not be saved.

12.4. AT+VTS DTMF and Tone Generation

The AT+VTS command is used to send ASCII characters which causes MSC to transmit DTMF tones to a remote subscriber. This command can only be operated in voice call.

AT+VTS DTMF and Tone Generation

Test Command AT+VTS=?	Response +VTS: (0-9,A-D,*,#),(0-255)
	OK
Write Command AT+VTS=<dtmfstring>[,<duration>]	Response OK ERROR
	If error is related to ME functionality: +CME ERROR: <err>

Maximum Response Time	Depends on the length of <dtmfstring> and <duration> .
Reference 3GPP TS 27.007	

Parameter

<dtmfstring>	ASCII characters in the set 0...9,#,*, A, B, C, D. The string should be enclosed in quotation marks ("...") When sending multiple tones at a time, the time interval of two tones <interval> can be specified by +VTD . The maximal length of the string is 31
<duration>	The duration of each tone in 1/10 seconds with tolerance. The value ranges from 0 to 255. If the duration is less than the minimum time specified by the network, the actual duration will be the network specified time. If this parameter is omitted, <duration> can be specified by +VTD .

Example

```

ATD12345678900;           //Dial
OK
<Call connect>
AT+VTS="1"                //The remote caller can hear the DTMF tone
OK
AT+VTS="1234567890A"     //Send multiple tones at a time
OK

```

12.5. AT+VTD Set Tone Duration

AT+VTD sets the duration of DTMF tones. This command can also set time interval of two tones when sending multiple tones at a time.

AT+VTD Set Tone Duration

Test Command AT+VTD=?	Response +VTD: (0-255),(0-255) OK
Read Command AT+VTD?	Response +VTD: <duration>,<interval> OK

Write Command AT+VTD=<duration>[,<interval>]	Response OK ERROR If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference 3GPP TS 27.007	

Parameter

<duration>	The duration tone in 1/10 seconds with tolerance. The value ranges from 0 to 255, and the default value is 3. If the duration is less than the minimum time specified by the network, the actual duration will be network specified time.
<interval>	The time interval of two tones when sending multiple tones at a time by +VTS . The value ranges from 0 to 255, and the default is 0.

NOTE

These parameters will not be saved.

12.6. AT+QAUDMOD Set Audio Mode

AT+QAUDMOD sets the audio mode required for the connected device. It will take effect at next sound activity.

AT+QAUDMOD Set Audio Mode

Test Command AT+QAUDMOD=?	Response +QAUDMOD: (list of supported <mode>s) OK
Read command AT+QAUDMOD?	Response +QAUDMOD: <mode> OK
Write Command AT+QAUDMOD=<mode>	Response OK

	If error is related to ME functionality: +CME ERROR: <err>
Maximum Response Time	300ms
Reference Quectel	

Parameter

<mode>	Numeric type, indicates the current configured audio mode
<u>0</u>	Echo canceller, noise suppressor, digital gain and calibration parameter for Handset
1	Echo canceller, noise suppressor, digital gain and calibration parameter for Headset
2	Echo canceller, noise suppressor, digital gain and calibration parameter for Speaker

12.7. AT+QDAI Digital Audio Interface Configure

AT+QDAI is used to configure the digital audio interface. When **<io>=1**, the user can define the PCM mode (master/slave mode) by configuration setting; when **<io>=3**, the external codec chip linked with PCM interface is the ALC5616 model through the I2C. The settings will take effect after module reboot.

AT+QDAI Digital Audio Interface Configure

Test Command AT+QDAI=?	Response +QDAI: (list of supported <io>s),(list of supported <mode>s),(list of supported <fsync>s),(list of supported <clock>s),(list of supported <format>s) OK
Read Command AT+QDAI?	Response +QDAI: <io> [, <mode> , <fsync> , <clock> , <format>] OK
Write Command AT+QDAI=<io>[,<mode>,<fsync>,<clock>[,<format>]]	Response OK ERROR
Maximum Response Time	300ms
Reference Quectel	

Parameter

<io>	1	Digital PCM output (customer defined)
	2	Reserved
	3	Analog output (for our default audio codec alc5616)
<mode>	0	Master mode
	1	Slave mode
<fsync>	0	Primary mode (short-sync)
	1	Auxiliary mode (long-sync)
<clock>	0	128K
	1	256K
	2	512K
	3	1024K
	4	2048K
	5	4096K
<format>	0	16-bit linear
	1	8-bit a-law
	2	8-bit u-law

NOTES

1. Configuration of <io> will be saved to NV immediately by default.
2. Now master & slave mode under short sync signal, and master mode under long sync signal are supported.
3. When you select short-sync & master mode, 256K-4096K clock frequency is supported. And if you select long-sync & master mode, only 128K clock frequency is supported.
4. When you select slave mode, you must provide master & sync clock for the module.

Example

```
AT+QDAI=? //Query the range.
```

```
+QDAI: (1-3),(0,1),(0,1),(0-5),(0-2)
```

```
OK
```

```
AT+QDAI? //Query the current interface configuration.
```

```
+QDAI: 1,0,0,4,0
```

```
OK
```

```
AT+QDAI=1,1,0,4,1 //Set AUX PCM interface to slave short-sync mode, PCM format 8-bit a-law.
```

```
OK
```

13 Hardware Related Commands

13.1. AT+QPOWD Power off

The command AT+QPOWD 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 message "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 STATE pin is set low or the URC "POWERED DOWN" is output to avoid data loss.

AT+QPOWD Power off

Test Command
AT+QPOWD=?

Response
+QPOWD: (0,1)

OK

Execute Command
AT+QPOWD[=<n>]

Response
OK

POWERED DOWN

Maximum Response Time

300ms

Parameter

<n>	0	Immediately power down
	1	Normal power down

13.2. AT+CCLK Clock

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

AT+CCLK Clock

Test Command
AT+CCLK=?

Response
OK

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

Parameter

<time>	String type value, 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 6 th , 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
```

13.3. AT+CBC Battery Charge

AT+CBC returns battery charge status **<bcs>** and battery charge level **<bcl>** of the MT.

AT+CBC Battery Charge

Test Command AT+CBC=?	Response +CBC: (list of supported <bcs> s),(list of supported <bcl> s), <voltage>
	OK
Execution Command AT+CBC	Response +CBC: <bcs> , <bcl> , <voltage>

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

Parameter

<bcs>	Battery charge status 0 ME is not charging 1 ME is charging 2 Charging has finished
<bcl>	Battery charge level 0-100 Battery has 0-100 percent of capacity remaining vent
<voltage>	Battery voltage (Mv)

13.4. AT+QSCLK Configure Whether or Not to Enter into Sleep Mode

AT command “**AT+QSCLK**” is used to control whether the module enters into sleep mode. When **AT+QSCLK** is enabled, DTR is pulled up, and WAKEUP_IN is pulled up, the module can directly enter into sleep mode. If **AT+QSCLK** is enabled, DTR is pulled down, and WAKEUP_IN is pulled down, you need to pull the DTR pin and the WAKEUP_IN pin up first, and then the module can enter into sleep mode.

AT+QSCLK Configure Whether or Not to Enter into Sleep Mode

Test Command AT+QSCLK=?	Response +QSCLK: (list of supported <n>s) OK
Read Command AT+QSCLK?	Response +QSCLK: <n> OK
Write Command AT+QSCLK=<n>	Response OK
Maximum Response Time	300ms
Reference	

Quectel

Parameter

<n>	<u>0</u>	Disable slow clock
	1	Enable slow clock, it is controlled by DTR

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14 Appendix

14.1. References

Table 6: 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 7: Terms and Abbreviations

Abbreviation	Description
AMR	Adaptive Multi-Rate
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
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

14.2. Factory Default Settings Restorable with AT&F

Table 8: 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>	1
AT+ICF	<format>,<parity>	3,3
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>,<dc>	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+CLIP	<n>	0

AT+COLP	<n>	0
AT+CLIR	<n>	0
AT+CSSN	<n>	0
AT+CTZR	<reporting>	0
AT+CPBS	<storage>	ME
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

14.3. AT Command Settings Storable with AT&W

Table 9: 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

14.4. AT Command Settings Storable with ATZ

Table 10: 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>	1
AT+CREG	<n>	0
AT+CGREG	<n>	0
AT+CEREG	<n>	0

14.5. Summary of CME ERROR Codes

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

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

Table 11: 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

14.6. Summary of CMS ERROR Codes

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

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

Table 12: 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

14.7. Summary of URC

Table 13: 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>	New short message is received and output directly to TE (PDU mode)	See AT+CNMI

	<pdu>		
9	+CMT: <oa>,[<alpha>],<scts>[,<tooa> ,<fo>,<pid>,<dcs>,<sca>,<tosc a>,<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>,<ty pe>,<stat><CR><LF><data>	New short message is received and output directly to TE (CDMA Text mode)	See AT+CNMI
11	+CBM: <length><CR><LF><pdu>	New CBM is received and output directly (PDU mode)	See AT+CNMI
12	+CBM: <sn>,<mid>,<dcs>,<page>,<p ages><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>],[<sct s>,<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>,<ty pe>,<stat><CR><LF><data>	New CDS is received and output directly to TE (In CDMA Text mode)	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],[s atype],[<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>[,<al pha>]	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>[,<dc>]]	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

14.8. SMS Character Sets Conversions

In 3GPP TS 23.038 DCS (Data Coding Scheme) defined three kinds of alphabets in SMS, GSM 7 bit default alphabet, 8 bit data and UCS2(16bit). 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 14: 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 15: The Input Conversions Table (DCS=GSM 7 bit and AT+CSCS="GSM")

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

B	0B	Cancel	2B	3B	4B	5B	6B	7B
C	0C	1C	2C	3C	4C	5C	6C	7C
D	0D	1A	2D	3D	4D	5D	6D	7D
E	0E	1E	2E	3E	4E	5E	6E	7E
F	0F	1F	2F	3F	4F	5F	6F	7F

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

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

Table 17: 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 18: 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 19: 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 20: 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 21: 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 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 14 for details.

14.9. Release Cause Text List of AT+CEER

Table 22: 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 \geq 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 cause

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

SNDTCP 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 SNDTCP 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
