



**4G-EZ Software Suite**



**VoLTE-ready**

# **Monarch Platform LR5.1.1.0 AT Commands Reference Manual**



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## Document Revision History

Revision	Date	Product Application
5	June 2018	Fifth edition of the AT Commands Reference Manual for LTE software release LR5.1.1.0
6	October 2018	Sixth edition of the AT Commands Reference Manual for LTE software release LR5.1.1.0

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# About this Manual

## Purpose and Scope

This Reference Manual specifies the complete list of AT commands supported by the Sequans LTE User Equipment (UE) firmware. It is applicable to 4G-EZ LTE Software Release LR5.1.1.0.

## Who Should Read this Document

This document is intended for engineers using Sequans LTE systems during the development and test phases.

## Changes in this Document

Changes since previous edition:

- Updated commands [Set LED Blink Mode: +SQNLED](#), [Read Data in NVM: +SQNSNVR](#), [Specific eDRX Settings: +SQNEDRX](#), [Define PDP Context: +CGDCONT](#)
- Added commands [File Download: +SQNFGET](#), [Download Status URC: +SQNFGETREPORT](#), [File Upload: +SQNFPUT](#), [Retrieve Current GUTI: +SQNGUTI](#), [UART Interface Power Saving Configuration: +SQNIPSCFG](#), [Non Volatile Data Decrypt: +SQNSDECRYPT](#), [Hardware Function Configuration: +SQNHWCFG](#), [Unsolicited Commands +SHUTDOWN](#), [+SYSSTART](#), [Time Zone Unsolicited Result Codes](#), [Event Notification URC: +CGEV](#), [+SQNSMSENDRES URC](#) in Section [Send Multiline SMS: +SQNSMSMLSEND](#), [USIM-Related Unsolicited Result Codes](#), [Sequans Manufacturing Integrated Circuit ID: +SMICID](#).
- Various edits.

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# References

Reference	Document Title
<i>ITU-T V.250</i> <a href="http://www.itu.int/rec/T-REC-V.250-200307-I/en">http://www.itu.int/rec/T-REC-V.250-200307-I/en</a>	SERIES V: DATA COMMUNICATION OVER THE TELEPHONE NETWORK - Control procedures - Serial asynchronous automatic dialling and control
<i>3GPP TS 27.007-13.6.0</i> <a href="http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/27007-d60.zip">http://www.3gpp.org/ftp/Specs/archive/27_series/27.007/27007-d60.zip</a>	AT commands set for User Equipment
<i>3GPP TS 27.005-13.0.0</i> <a href="http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/27005-d00.zip">http://www.3gpp.org/ftp/Specs/archive/27_series/27.005/27005-d00.zip</a>	AT commands set for Short Message Service (SMS) and Cell Broadcast Service (CBS)
<i>3GPP TR 21.905-9.4.0</i> <a href="http://www.3gpp.org/ftp/Specs/archive/21_series/21.905/21905-940.zip">http://www.3gpp.org/ftp/Specs/archive/21_series/21.905/21905-940.zip</a>	Vocabulary for 3GPP Specifications

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# Documentation Conventions

The following typographic conventions are used in this document.

General Conventions	
Note	Important information requiring the user's attention.
Caution 	A condition or circumstance that may cause damage to the equipment or loss of data.
Warning 	A condition or circumstance that may cause personal injury.
<i>Italics</i>	Italic font style denotes <ul style="list-style-type: none"><li>• Emphasis of an important word;</li><li>• First use of a new term;</li><li>• Title of a document.</li></ul>
<b>Screen Name</b>	Sans serif, bold font denotes <ul style="list-style-type: none"><li>• On-screen name of a window, dialog box or field;</li><li>• Keys on a keyboard;</li><li>• Labels printed on the equipment.</li></ul>

Software Conventions	
Code	Regular Courier font denotes code or text displayed on-screen.
<b>Code</b>	Bold Courier font denotes commands and parameters that you enter exactly as shown. Multiple parameters are grouped in brackets [ ]. If you are to choose only one among grouped parameters, the choices are separated with a pipe: [parm1   parm2   parm3] If there is no pipe separator, you must enter each parameter: [parm1 parm2 parm3]
<i>Code</i>	Italic Courier font denotes parameters that require you to enter a value or variable. Multiple parameters are grouped in brackets [ ]. If you are to choose only one among grouped parameters, the choices are separated with a pipe: [parm1   parm2   parm3] If there is no pipe separator, you must enter a value for each parameter: [parm1 parm2 parm3]

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**Appendix A**  
**Abbreviations . . . . . 363**



# 1

## 3GPP General Commands

### 1.1 eDRX Read Dynamic Parameters: +CEDRXRDP

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

#### 1.1.1 Syntax

Command	Possible Response(s)
AT+CEDRXRDP	+CEDRXRDP: <AcT-type>[, <Requested_eDRX_value>[, <NW-provided_eDRX_value>[, <Paging_time_window>]]]
AT+CEDRXRDP=?	

#### 1.1.2 Description

The execution command returns <AcT-type> and <Requested\_eDRX\_value>, <NW-provided\_eDRX\_value> and <Paging\_time\_window> if eDRX is used for the cell that the MS is currently registered to.

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

## 1.1.3 Defined Values

### AcT-type

Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.

**Table 1-1:** *AcT-type*

Value	Description
0	Access technology is not using eDRX. This parameter value is only used in the unsolicited result code.
1	EC-GSM-IoT (A/Gb mode)
2	GSM (A/Gb mode)
3	UTRAN (Iu mode)
4	E-UTRAN (WB-S1 mode)
5	E-UTRAN (NB-S1 mode)

### Requested\_eDRX\_value

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.

### NW-provided\_eDRX\_value

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

### Paging\_time\_window

String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

## 1.2 eDRX Setting: +CEDRXS

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.2.1 Syntax

Command	Possible Response(s)
<b>AT+CEDRXS</b> =[<mode>],[<AcT-type>],[<Requested_eDRX_value>]]	+CME ERROR: <err>
<b>AT+CEDRXS?</b>	[+CEDRXS: <AcT-type>,<Requested_eDRX_value> [<CR><LF>+CEDRXS:<AcT-type>,<Requested_eDRX_value>[...]]]
<b>AT+CEDRXS=?</b>	+CEDRXS: (list of supported <mode>s), (list of supported <AcT-type>s), (list of supported <Requested_eDRX_value>s)

### 1.2.2 Description

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

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

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

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

The read command returns the current settings for each defined value of <AcT-type>.

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

## 1.2.3 Defined Values

### mode

Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.

**Table 1-2:** *mode*

Value	Description
0	Disable the use of eDRX
1	Enable the use of eDRX
2	Enable the use of eDRX and enable the unsolicited result code +CEDRXP: <AcT-type> [, <Requested_eDRX_value> [, <NW-provided_eDRX_value> [, <Paging_time_window>]]]
3	Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.

### AcT-type

Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.

**Table 1-3:** *AcT-type*

Value	Description
0	Access technology is not using eDRX. This parameter value is only used in the unsolicited result code.
1	EC-GSM-IoT (A/Gb mode)
2	GSM (A/Gb mode)
3	UTRAN (Iu mode)
4	E-UTRAN (WB-S1 mode)
5	E-UTRAN (NB-S1 mode)

### **Requested\_eDRX\_value**

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.

### **NW-provided\_eDRX\_value**

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

### **Paging\_time\_window**

String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

## 1.3 Request Manufacturer Identification: +CGMI

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*. See also +GMI command.

---

### 1.3.1 Syntax

Command	Possible Response(s)
AT+CGMI	<manufacturer> +CME ERROR: <err>
AT+CGMI=?	

### 1.3.2 Description

Execution command causes the TA to return one or more lines of information text <manufacturer>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the manufacturer of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.3.3 Defined Values

**manufacturer**

String. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>

## 1.4 Request Model Identification: +CGMM

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*. See also +GMM command.

---

### 1.4.1 Syntax

Command	Possible Response(s)
AT+CGMM	<model> +CME ERROR: <err>
AT+CGMM=?	

### 1.4.2 Description

Execution command causes the TA to return one or more lines of information text <model>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the specific model of the MT to which it is connected to. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide more information if desired.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.4.3 Defined Values

**model**

String. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>

## 1.5 Request Revision Identification: +CGMR

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*. See also +GMR command.

---

### 1.5.1 Syntax

Command	Possible Response(s)
AT+CGMR	<revision> +CME ERROR: <err>
AT+CGMR=?	

### 1.5.2 Description

Execution command causes the TA to return one or more lines of information text <revision>, determined by the MT manufacturer, which is intended to permit the user of the TA to identify the version, revision level or date, or other pertinent information of the MT to which it is connected to. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide more information if desired.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.5.3 Defined Values

**revision**

String. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>



## 1.6 Request Product Serial Number Identification: +CGSN

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*. See also +GSN command.

### 1.6.1 Syntax

Command	Possible Response(s)
AT+CGSN[=<snt>]	when <snt>=0 (or omitted) and command successful: <sn> when <snt>=1 and command successful: +CGSN:<imei> when <snt>=2 and command successful: +CGSN:<imeisv> when <snt>=3 and command successful: +CGSN:<svn> +CME ERROR:<err>
AT+CGSN=?	when TE supports <snt> and command successful: +CGSN: OK

### 1.6.2 Description

Execution command causes the TA to return IMEI (International Mobile station Equipment Identity number) and related information to identify the MT that the TE is connected to.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Test command returns values supported as a compound value. For a TA which does not support <snt>, only OK is returned.

## 1.6.3 Defined Values

### snt

Integer type indicating the serial number type that has been requested.

**Table 1-4:** *snt*

Value	Description
0	returns <sn>
1	returns the IMEI (International Mobile station Equipment Identity)
2	returns the IMEISV (International Mobile station Equipment Identity and Software Version number)
3	returns the SVN (Software Version Number)

### sn

String. one or more lines of information text determined by the MT manufacturer. Typically, the text will consist of a single line containing the IMEI number of the MT, but manufacturers may choose to provide more information if desired. The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>

### imei

String type in decimal format indicating the IMEI; refer 3GPP TS 23.003 [7], subclause 6.2.1. IMEI is composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) and the Check Digit (CD) (1 digit). Character set used in <imei> is as specified by command [Select TE Character Set: +CSCS](#).

### imeisv

String type in decimal format indicating the IMEISV; refer 3GPP TS 23.003 [7], subclause 6.2.2. The 16 digits of IMEISV are composed of Type Allocation Code (TAC) (8 digits), Serial Number (SNR) (6 digits) ETSI 3GPP TS 27.007 version 12.10.0 Release 12 23 ETSI TS 127 007 V12.10.0 (2015-10) and the software version (SVN) (2 digits). Character set used in <imeisv> is as specified by command [Select TE Character Set: +CSCS](#).

### svn

String type in decimal format indicating the current SVN which is a part of IMEISV; refer 3GPP TS 23.003 [7], subclause 6.2.2. This allows identifying different software versions of a given mobile. Character set used in <svn> is as specified by command [Select TE Character Set: +CSCS](#).

---

**Note:** The default value <snt>=0 returns the information text <sn> with no command name prefixed. This has been done to retain backward compatibility. All other values of <snt> return the information text including command name prefix.

---

## 1.6.4 Informative examples

- To get <sn> which returns IMEI of the MT

```
AT+CGSN
490154203237518
OK
```
- To get <imei> which returns IMEI of the MT

```
AT+CGSN=1
+CGSN: "490154203237518"
OK
```

## 1.7 Request International Mobile Subscriber Identity: +CIMI

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.7.1 Syntax

Command	Possible Response(s)
AT+CIMI	<IMSI> +CME ERROR: <err>
AT+CIMI=?	

### 1.7.2 Description

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card or active application in the UICC (GSM or USIM) which is attached to MT.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.7.3 Defined Values

#### IMSI

String (without double quotes). International Mobile Subscriber Identity.

## 1.8 Indicator Control: +CIND

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.8.1 Syntax

Command	Possible Response(s)
AT+CIND=[<ind>[,<ind>[,...]] ]]	+CME ERROR: <err>
AT+CIND?	+CIND: <ind>[,<ind>[,...]] +CME ERROR: <err>
AT+CIND=?	+CIND: (<descr>,list of supported <ind>s)[(<descr>,list of supported <ind>s)[,...]] +CME ERROR: <err>

### 1.8.2 Description

Set command is used to set the values of MT indicators. <ind> value 0 means that the indicator is off (or in state which can be identified as "off" state), 1 means that indicator is on (or in a state which is more substantial than "off" state), 2 is more substantial than 1, and so on. If the indicator is a simple on/off style element, it has values 0 and 1. The number of elements is MT specific. If MT does not allow setting of indicators or MT is not currently reachable, +CME ERROR: <err> is returned.

If certain indicator is not writable, setting of it should be ignored. If parameter is empty field, indicator shall remain in the previous value.

Read command returns the status of MT indicators. If MT is not currently reachable, +CME ERROR: <err> is returned.

Test command returns pairs, where string value <descr> is a maximum 16 character description of the indicator and compound value is the allowed values for the indicator. If MT is not currently reachable, +CME ERROR: <err> is returned.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

---

**Note:** MT manufacturer should offer the description of supported indicators not listed here and their value ranges and default values.

---

## 1.8.3 Defined Values

### ind

Integer type value, which shall be in range of corresponding <descr>

### descr

String values reserved by the present document and their <ind> ranges:

**Table 1-5:** *descr*

Value	Description
"battchg"	battery charge level (0 5)
"signal"	signal quality (0 5)
"service"	service availability (0 1)
"sounder"	sounder activity (0 1)
"message"	message received (0 1)
"call"	call in progress (0 1)
"vox"	transmit activated by voice activity (0 1)
"roam"	roaming indicator (0 1)
"smsfull"	a short message memory storage in the MT has become full and a short message has been rejected (2), has become full (1), or memory locations are available (0); i.e. the range is (0 2)
"inputstatus"	keypad/touch screen status (0-1)

## 1.9 List All Available AT Commands: +CLAC

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.9.1 Syntax

Command	Possible Response(s)
AT+CLAC	<AT Command1>[<CR><LF><AT Command2>[...]]
AT+CLAC=?	+CME ERROR: <err>

### 1.9.2 Description

Execution command causes the MT to return one or more lines of AT Commands.

---

**Note:** This command only returns the AT commands that are available for the user.

---

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.9.3 Defined Values

#### AT Command

String. Defines the AT command including the prefix AT. Text shall not contain the sequence 0<CR> or OK<CR>

## 1.10 Facility Lock: +CLCK

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
See the current implementation limitation in `fac` parameter description.

---

### 1.10.1 Syntax

Command	Possible Response(s)
<code>AT+CLCK=&lt;fac&gt;,&lt;mode&gt;[,&lt;passwd&gt;[,&lt;class&gt;]]</code>	+CME ERROR: <err> when <mode>=2 and command successful: +CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2> [...]]
<code>AT+CLCK=?</code>	+CLCK: (list of supported <fac>s)

### 1.10.2 Description

Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated.

Call barring facilities are based on GSM/UMTS supplementary services (refer 3GPP TS 22.088 [6]). The interaction of these with other commands based on other GSM/UMTS supplementary services is described in the GSM/UMTS standard.

Test command returns facility values supported as a compound value.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.



## 1.10.3 Defined Values

**fac**

String. Facility.

---

**Caution:** The "SC", "FD", "PN" and "PS" facilities are currently implemented.

---

**Table 1-6:** *fac*

Value	Description
"CS"	CNTRL (lock CoNTRoL surface (e.g. phone keyboard))
"PS"	PH SIM (lock PHone to SIM/UICC card installed in the currently selected card slot) (MT asks password when other than current SIM/UICC card inserted; MT may remember certain amount of previously used cards thus not requiring password when they are inserted)
"PF"	lock Phone to the very First inserted SIM/UICC card (also referred in the present document as PH-FSIM) (MT asks password when other than the first SIM/UICC card is inserted)
"SC"	SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power up and when this lock command issued)
"AO"	BAOC (Barr All Outgoing Calls) (refer 3GPP TS 22.088 [6] clause 1)
"OI"	BOIC (Barr Outgoing International Calls) (refer 3GPP TS 22.088 [6] clause 1)
"OX"	BOIC exHC (Barr Outgoing International Calls except to Home Country) (refer 3GPP TS 22.088 [6] clause 1)
"AI"	BAIC (Barr All Incoming Calls) (refer 3GPP TS 22.088 [6] clause 2)
"IR"	BIC Roam (Barr Incoming Calls when Roaming outside the home country) (refer 3GPP TS 22.088 [6] clause 2)
"NT"	barr incoming calls from numbers Not stored to TA memory
"NM"	barr incoming calls from numbers Not stored to MT memory
"NS"	barr incoming calls from numbers Not stored to SIM/UICC memory
"NA"	barr incoming calls from numbers Not stored in Any memory
"AB"	All Barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0)
"AG"	All outGoing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0)

**Table 1-6:** *fac* (Continued)

Value	Description
"AC"	All inComing barring services (refer 3GPP TS 22.030 [19]) (applicable only for <mode>=0)
"FD"	SIM card or active application in the UICC (GSM or USIM) fixed dialling memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
"PN"	Network Personalization (refer 3GPP TS 22.022 [33])
"PU"	network sUbset Personalization (refer 3GPP TS 22.022 [33])
"PP"	service Provider Personalization (refer 3GPP TS 22.022 [33])
"PC"	Corporate Personalization (refer 3GPP TS 22.022 [33])

**mode**

Integer. Mode.

**Table 1-7:** *mode*

Value	Description
0	unlock
1	lock
2	query status

**status**

Integer. Status.

**Table 1-8:** *status*

Value	Description
0	Not active
1	Active

**passwd**

String. Shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD.

**classx**

Integer. <classx> is a sum of integers each representing a class of information. Default is 7 - voice + data + fax.

**Table 1-9:** *classx*

Value	Description
1	voice (telephony)
2	data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 and 128)
4	fax (facsimile services)
8	short message service
16	data circuit sync
32	data circuit async
64	dedicated packet access
128	dedicated PAD access

## 1.11 Subscriber Number: +CNUM

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 1.11.1 Syntax

Command	Possible Response(s)
AT+CNUM	+CNUM : [<alpha1>,<number1>,<type1>[,<speed>,<service>[,<itc>]]][<CR><LF>+CNUM : [<alpha2>,<number2>,<type2>[,<speed>,<service>[,<itc>]]][...]  +CME ERROR: <err>
AT+CNUM=?	

### 1.11.2 Description

Action command returns the MSISDNs related to the subscriber (this information can be stored in the SIM/UICC or in the MT). When storing information in the SIM/UICC, if the currently selected card slot contains a SIM card or a UICC with an active GSM application, the information is stored in the EFMSISDN under DFTelecom. If the currently selected card slot contains a UICC with an active USIM application, the information is stored in the EFMSISDN under ADFUSIM). If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line. See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 1.11.3 Defined Values

### **alphax**

String. Associated with <numberx>; used character set should be the one selected with command [1.19 Select TE Character Set: +CSCS](#) on page 39.

### **numberx**

String. Phone number of format specified by <typex>.

### **typex**

Integer. Type of address octet (refer 3GPP TS 24.008 [8] subclause 10.5.4.7)

### **speed**

As defined in subclause 6.7

### **service**

Integer. Service related to the phone number.

**Table 1-10:** *service*

Value	Description
0	asynchronous modem
1	synchronous modem
2	PAD Access (asynchronous)
3	Packet Access (synchronous)
4	Voice
5	Fax
All other values below 128 are reserved	

### **itc**

Integer. Information transfer capability.

**Table 1-11:** *itc*

Value	Description
0	3,1 kHz
1	UDI

## 1.12 Read Operator Names: +COPN

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.12.1 Syntax

Command	Possible Response(s)
AT+COPN	+COPN:<numeric1>,<alpha1>[<CR><LF>+COPN:<numeric2>,<alpha2> [...]] +CME ERROR:<err>
AT+COPN=?	

### 1.12.2 Description

Execute command returns the list of operator names from the MT. Each operator code <numericn> that has an alphanumeric equivalent <alphan> in the MT memory shall be returned.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.12.3 Defined Values

**numericn**

String type; operator in numeric format (see +COPS).

**alphan**

String type; operator in long alphanumeric format (see +COPS).

## 1.13 PLMN Selection: +COPS

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.13.1 Syntax

Command	Possible Response(s)
AT+COPS[<mode>[,<format>[,<oper>[,<AcT>]]]]	+CME ERROR: <err>
AT+COPS?	+COPS : <mode>[,<format>,<oper>[,<AcT>]] +CME ERROR: <err>
AT+COPS=?	+COPS : [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][, (list of supported <mode>s), (list of supported <format>s)] +CME ERROR: <err>

### 1.13.2 Description

Set command forces an attempt to select and register the GSM/UMTS/EPS network operator using the SIM/USIM card installed in the currently selected card slot. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper> (it shall be given in format <format>) to a certain access technology, indicated in <AcT>. If the selected operator is not available, no other operator shall be selected (except <mode>=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall apply to further read commands (+COPS?) also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, MT shall be unregistered until <mode>=0 or 1 is selected). This command should be abortable when registration/deregistration attempt is made.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Read command returns the current mode, the currently selected operator and the current Access Technology. If no operator is selected, <format>, <oper> and <AcT> are omitted.

Test command returns a set of five parameters, each representing an operator present in the network. A set consists of an integer indicating the availability of the operator `<stat>`, long and short alphanumeric format of the name of the operator, numeric format representation of the operator and access technology. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks.

It is recommended (although optional) that after the operator list TA returns lists of supported `<mode>s` and `<format>s`. These lists shall be delimited from the operator list by two commas.

The access technology selected parameters, `<AcT>`, should only be used in terminals capable to register to more than one access technology. Selection of `<AcT>` does not limit the capability to cell reselections, even though an attempt is made to select an access technology, the phone may still re-select a cell in another access technology.

### 1.13.3 Defined Values

#### mode

Integer.

**Table 1-12:** *mode*

Value	Description
0	automatic ( <code>&lt;oper&gt;</code> field is ignored)
1	manual ( <code>&lt;oper&gt;</code> field shall be present, and <code>&lt;AcT&gt;</code> optionally)
2	deregister from network
3	set only <code>&lt;format&gt;</code> (for read command +COPS?), do not attempt registration/deregistration ( <code>&lt;oper&gt;</code> and <code>&lt;AcT&gt;</code> fields are ignored); this value is not applicable in read command response
4	manual/automatic ( <code>&lt;oper&gt;</code> field shall be present); if manual selection fails, automatic mode ( <code>&lt;mode&gt;=0</code> ) is entered



**format**

Integer.

**Table 1-13:** *format*

Value	Description
0	long format alphanumeric <oper>
1	short format alphanumeric <oper>
2	numeric <oper>

**oper**

String type; <format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer 3GPP TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU T Recommendation E.212 [10] Annex A, plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network code digit 2)(network code digit 1).

**stat**

Integer.

**Table 1-14:** *stat*

Value	Description
0	unknown
1	available
2	current
3	forbidden

**AcT**

Integer. The parameter sets/shows the access technology selected.

**Table 1-15:** *AcT*

Value	Description
0	GSM
1	GSM Compact
2	UTRAN
3	GSM w/EGPRS (see NOTE 1)
4	UTRAN w/HSDPA (see NOTE 2)
5	UTRAN w/HSUPA (see NOTE 2)
6	UTRAN w/HSDPA and HSUPA (see NOTE 2)
7	E-UTRAN

NOTE 1:3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 2:3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

## 1.14 Enter PIN: +CPIN

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.14.1 Syntax

Command	Possible Response(s)
AT+CPIN= <pin>[,<newpin>]	+CME ERROR: <err>
AT+CPIN?	+CPIN: <code> +CME ERROR: <err>
AT+CPIN=?	

### 1.14.2 Description

The “Set” command sends to the MT a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE.

Notes:

1. SIM PIN, SIM PUK, PH-SIM PIN, PH-FSIM PIN, PH-FSIM PUK, SIM PIN2 and SIM PUK2 refer to the PIN of the selected application on the UICC. For example, in an UTRAN context, the selected application on the currently selected UICC should be a USIM and the SIM PIN then represents the PIN of the selected USIM. See 3GPP TS 31.101 [65] for further details on application selection on the UICC.

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

2. Commands which interact with MT that are accepted when MT is pending SIM PIN, SIM PUK, or PH SIM are: +CGMI, +CGMM, +CGMR, +CGSN, D112; (emergency call), +CPAS, +CFUN, +CPIN, +CPINR, +CDIS (read and test command only), and +CIND (read and test command only).

Read command returns an alphanumeric string indicating whether some password is required or not.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.14.3 Defined Values

**pin**

String. PIN code.

**newpin**

String. New PIN code.

**code**

<code> values reserved by the present document:

**Table 1-16:** *code*

Value	Description
READY	MT is not pending for any password
SIM PIN	MT is waiting SIM PIN to be given
SIM PUK	MT is waiting SIM PUK to be given
PH-SIM PIN	MT is waiting phone to SIM card password to be given
PH-FSIM PIN	MT is waiting phone-to-very first SIM card password to be given
PH-FSIM PUK	MT is waiting phone-to-very first SIM card unblocking password to be given
SIM PIN2	MT is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that MT does not block its operation)
SIM PUK2	MT is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2 are not entered right after the failure, it is recommended that MT does not block its operation)
PH-NET PIN	MT is waiting network personalization password to be given
PH-NET PUK	MT is waiting network personalization unblocking password to be given
PH-NETSUB PIN	MT is waiting network subset personalization password to be given

**Table 1-16:** *code* (Continued)

<b>Value</b>	<b>Description</b>
PH-NETSUB PUK	MT is waiting network subset personalization unblocking password to be given
PH-SP PIN	MT is waiting service provider personalization password to be given
PH-SP PUK	MT is waiting service provider personalization unblocking password to be given
PH-CORP PIN	MT is waiting corporate personalization password to be given
PH-CORP PUK	MT is waiting corporate personalization unblocking password to be given

## 1.15 Remaining PIN Retries: +CPINR

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
See the current implementation limitation in `sel_code` parameter description.

---

### 1.15.1 Syntax

Command	Possible Response(s)
AT+CPINR= [ <code>&lt;sel_code&gt;</code> ]	+CME ERROR: <code>&lt;err&gt;</code>
AT+CPINR=?	

### 1.15.2 Description

Execution command cause the MT to return the number of remaining PIN retries for the MT passwords with intermediate result code +CPINR: `<code>`, `<retries>` [, `<default_retries>`] for standard PINs. One line with one intermediate result code is returned for every `<code>` or `<ext_code>` selected by `<sel_code>`.

When execution command is issued without the optional parameter `<sel_code>`, intermediate result codes are returned for all `<code>`s and `<ext_code>`s.

In the intermediate result codes, the parameter `<default_retries>` is an optional (manufacturer specific) parameter, per `<code>` and `<ext_code>`.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for `<err>` values.

## 1.15.3 Defined Values

---

**Caution:** Restriction for `sel_code` parameter: only "SIM PIN" and "SIM PUK" codes are supported. Wildcard matching by "\*" is not supported.

---

### **retries**

Integer type. Number of remaining retries per PIN.

### **default\_retries**

Integer type. Number of default/initial retries per PIN.

### **code**

Type of PIN. All values listed under the description of the AT+CPINR command, `<code>` parameter, except 'READY'.

### **ext\_code**

Extended, manufacturer specific codes.

### **sel\_code**

String type. Same values as for the `<code>` and `<ext_code>` parameters. These values are strings and shall be indicated within double quotes. It is optional to support wildcard match by '\*', meaning match any (sub-)string.

Example: AT+CPINR="SIM\*" will return the lines:

```
+CPINR: SIM PIN,<retries>,<default_retries>
+CPINR: SIM PUK,<retries>,<default_retries>
+CPINR: SIM PIN2,<retries>,<default_retries>
+CPINR: SIM PUK2,<retries>,<default_retries>
```

Example: AT+CPINR="\*SIM\*" will additionally return the lines:

```
+CPINR: PH-SIM PIN,<retries>,<default_retries>
+CPINR: PH-FSIM PIN,<retries>,<default_retries>
+CPINR: PH-FSIM
PUK,<retries>,<default_retries>
```

## 1.16 Selection of Preferred PLMN List: +CPLS

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 1.16.1 Syntax

Command	Possible Response(s)
AT+CPLS<list>	+CME ERROR: <err>
AT+CPLS?	+CPLS: <list> +CME ERROR: <err>
AT+CPLS=?	+CPLS: (list of supported <list>s) +CME ERROR: <err>

### 1.16.2 Description

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

Execute command selects a list in the SIM/USIM.

Read command returns the selected PLMN selector list from the SIM/USIM.

Test command returns the whole index range supported lists by the SIM/USIM.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.



## 1.16.3 Defined Values

**list**

Integer type

**Table 1-17:** *list*

Value	Description
0	User controlled PLMN selector with Access Technology EF <sub>PLMNwAcT</sub> , if not found in the SIM/UICC then PLMN preferred list EFPLMNsel (this file is only available in SIM card or GSM application selected in UICC)
1	Operator controlled PLMN selector with Access Technology EF <sub>OPLMNwAcT</sub>
2	HPLMN selector with Access Technology EF <sub>HPLMNwAcT</sub>

## 1.17 Preferred PLMN List: +CPOL

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 1.17.1 Syntax

Command	Possible Response(s)
<b>AT+CPOL</b> [[<index>],[<format>],[<oper>],[<GSM_AcT>,<GSM_Compact_AcT>,<UTRAN_AcT>,<E-UTRAN_AcT>]]]	+CME ERROR: <err>
<b>AT+CPOL?</b>	+CPOL: [<index1>,<format>,<oper1>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<E-UTRAN_AcT1>] [<CR><LF>+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT2>,<GSM_Compact_AcT2>,<UTRAN_AcT2>,<E-UTRAN_AcT2>] [...]] +CME ERROR: <err>
<b>AT+CPOL=?</b>	+CPOL: (list of supported <index>s),(list of supported <format>s) +CME ERROR: <err>

### 1.17.2 Description

This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC (GSM or USIM).

Execute command writes an entry in the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, EFPLMNwAcT, is the one accessed by default. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, <GSM\_AcT>, <GSM\_Compact\_AcT> and <UTRAN\_AcT> and <E-UTRAN\_AcT> are required when writing User controlled PLMN selector with Access Technology, EFPLMNwAcT, Operator controlled PLMN selector with Access Technology EFOPLMNwAcT and HPLMN selector with Access Technology EFHPLMNwAcT, see 3GPP TS 31.102 [59].

Notes:

1. MT can also update the User controlled PLMN selector with Access Technology, EFPLMNwAcT, automatically when new networks are selected.
2. The Operator controlled PLMN selector with Access Technology EFOPLMNwAcT, can only be written if the write access condition in the SIM/USIM has been previously verified.

Read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS, with the Access Technologies for each PLMN in the list.

Test command returns the whole index range supported by the SIM.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 1.17.3 Defined Values

**index*n***

Integer type; the order number of operator in the SIM/USIM preferred operator list

**format**

Integer type

**Table 1-18:** *format*

Value	Description
0	Long format alphanumeric <oper>
1	Short format alphanumeric <oper>
2	Numeric <oper>

**oper*n***

String type; <format> indicates if the format is alphanumeric or numeric (see +COPS)

**GSM\_AcTn**

Integer type; GSM access technology

**Table 1-19:** *GSM\_AcTn*

Value	Description
0	Access technology not selected
1	Access technology selected

**GSM\_Compact\_AcTn**

Integer type; GSM compact access technology

**Table 1-20:**

Value	Description
0	Access technology not selected
1	Access technology selected

**UTRAN\_AcTn**

Integer type; UTRAN access technology

**Table 1-21:** *UTRAN\_AcTn*

Value	Description
0	Access technology not selected
1	Access technology selected

**E-UTRAN\_AcTn**

Integer type; E-UTRAN access technology

**Table 1-22:** *E-UTRAN\_AcTn*

Value	Description
0	Access technology not selected
1	Access technology selected

## 1.18 Change Password: +CPWD

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.  
See the current implementation limitation in `fac` parameter description.

---

### 1.18.1 Syntax

Command	Possible Response(s)
<code>AT+CPWD=&lt;fac&gt;,&lt;oldpwd&gt;,&lt;newpwd&gt;</code>	<code>+CME ERROR: &lt;err&gt;</code>
<code>AT+CPWD=?</code>	<code>+CPWD: list of supported (&lt;fac&gt;,&lt;pwdlength&gt;)s</code>

### 1.18.2 Description

Action command sets a new password for the facility lock function defined by command Facility Lock +CLCK.

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 1.18.3 Defined Values

### fac

String. Facility. See [1.10 Facility Lock: +CLCK](#) on page 16 for other values.

---

**Caution:** Only the "SC" and "P2" facilities are currently implemented.

---

**Table 1-23:** *fac*

Value	Description
"P2"	SIM PIN2
"SC"	SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power up and when this lock command issued)

### oldpwd, newpwd

String. <oldpwd> shall be the same as password specified for the facility from the MT user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>.

### pwdlength

Integer. Maximum length of the password for the facility

## 1.19 Select TE Character Set: +CSCS

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.19.1 Syntax

Command	Possible Response(s)
AT+CSCS=<chset>	OK
AT+CSCS?	+CSCS : <chset> OK
AT+CSCS=?	+CSCS : (list of supported <chset>s) OK

### 1.19.2 Description

The “Set” command informs TA which character set <chset> is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

When TA TE interface is set to 8 bit operation and used TE alphabet is 7 bit, the highest bit shall be set to zero.

---

**Note:** It is manufacturer specific how the internal alphabet of MT is converted to/from the TE alphabet.

---

Read command shows current setting and test command displays conversion schemes implemented in the TA.

## 1.19.3 Defined Values

### chset

Character: character set as a string type (conversion schemes not listed here can be defined by manufacturers).

---

**Caution:** The "GSM", "UCS2", "IRA" and "ITF-8" types are currently implemented.

---

**Table 1-24:** *chset*

Value	Description
"GSM"	GSM 7 bit default alphabet (3GPP TS 23.038 [25]); this setting causes easily software flow control (XON/XOFF) problems. Note: If MT is using GSM 7 bit default alphabet, its characters shall be padded with 8th bit (zero) before converting them to hexadecimal numbers (i.e. no SMS style packing of 7 bit alphabet).
"HEX"	Character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done.
"IRA"	International reference alphabet (see ITU T Recommendation T.50 [13]).
"PCCPxxx"	PC character set Code Page xxx
"PCDN"	PC Danish/Norwegian character set
"UCS2"	16-bit universal multiple-octet coded character set (see ISO/IEC10646 [32]); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF; e.g. "004100620063" equals three 16-bit characters with decimal values 65, 98 and 99.
"UTF-8"	Octet (8-bit) lossless encoding of UCS characters (see RFC 3629 [69]); UTF-8 encodes each UCS character as a variable number of octets, where the number of octets depends on the integer value assigned to the UCS character. The input format shall be a stream of octets. It shall not be converted to hexadecimal numbers as in "HEX" or "UCS2". This character set requires an 8-bit TA - TE interface.
"8859-n"	ISO 8859 Latin n (1 6) character set
"8859-C"	ISO 8859 Latin/Cyrillic character set
"8859-A"	ISO 8859 Latin/Arabic character set
"8859-G"	ISO 8859 Latin/Greek character set
"8859-H"	ISO 8859 Latin/Hebrew character set



## 1.20 Signal quality: +CSQ

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

### 1.20.1 Syntax

Command	Possible Response(s)
AT+CSQ	+CSQ: <rss>, <ber> +CME ERROR: <err>
AT+CSQ=?	+CSQ: (list of supported <rss>),(list of supported <ber>)

### 1.20.2 Description

Execution command returns received signal strength indication <rss> and channel bit error rate <ber> from the MT.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Test command returns values supported as compound values.

## 1.20.3 Defined Values

### **rsqi**

Integer. Received signal strength indication.

**Table 1-25:** *rsqi*

Value	Description
0	-113 dBm or less
1	-111 dBm
2 .. 30	-109 .. -53 dBm
31	-51 dBm or greater
99	not known or not detectable

### **ber**

Integer. Channel bit error rate (in percent).

**Table 1-26:** *ber*

Value	Description
0 .. 7	as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
99	not known or not detectable

## 1.21 Time Zone Reporting: +CTZR

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.21.1 Syntax

Command	Possible Response(s)
AT+CTZR=<reporting>	+CME ERROR: <err>
AT+CTZR?	+CTZR: <reporting> +CME ERROR: <err>
AT+CTZR=?	+CTZR: (list of supported <reporting>s +CME ERROR: <err>

### 1.21.2 Description

This set command controls the time zone change event reporting. 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 MT also provides the time zone upon network registration if provided by the network. If setting fails in an MT error, +CME ERROR: <err> is returned.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Read command returns the current reporting settings in the MT.

Test command returns supported <reporting>-values.

---

**Note:** The Time Zone reporting is not affected by the Automatic Time Zone setting command, +CTZU.

---

## 1.21.3 Defined Values

**reporting**  
Integer.

**Table 1-27:** *reporting*

Value	Description
0	disable time zone change event reporting.
1	Enable time zone change event reporting by unsolicited result code +CTZV : <tz>.
2	Enable extended time zone reporting by unsolicited result code +CTZE : <tz>, <dst>, [<time>].

**tz**

String type value representing the sum of the local time zone (difference between the local time and GMT 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. Value indicating whether <tz> includes daylight savings adjustment.

**Table 1-28:** *dst*

Value	Description
0	<tz> includes no adjustment for Daylight Saving Time
1	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 value representing 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 at the time of delivering time zone information and will be present in the extended time zone reporting unsolicited result code if provided by the network.

## 1.22 Automatic Time Zone Update: +CTZU

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.22.1 Syntax

Command	Possible Response(s)
AT+CTZU=<onoff>	+CME ERROR: <err>
AT+CTZU?	+CTZU: <onoff> +CME ERROR: <err>
AT+CTZU=?	+CTZU: (list of supported <onoff>s +CME ERROR: <err>

### 1.22.2 Description

Set command enables and disables automatic time zone update via NITZ. If setting fails in an MT error, +CME ERROR: <err> is returned.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Read command returns the current settings in the MT.

Test command returns supported on- and off-values.

### 1.22.3 Defined Values

**onoff**

Integer. Indicator.

**Table 1-29:** *onoff*

Value	Description
0	Disable automatic time zone update via NITZ.
1	Enable automatic time zone update via NITZ..

## 1.23 Time Zone Unsolicited Result Codes

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 1.23.1 Syntax and Description

URC	Description
+CTZE:<tz>,<dst>,<time>]	If reporting is enabled and according to the level of reporting, the MT returns the unsolicited result code +CTZV: <tz> or +CTZE: <tz>,<dst>,<time>] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network. See also <a href="#">1.21 Time Zone Reporting: +CTZR</a> on page 43.
+CTZV:<tz>	

### 1.23.2 Defined Values

**tz**

String type value representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is " $\pm zz$ ", 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. Value indicating whether <tz> includes daylight savings adjustment.

**Table 1-30:** *dst*

Value	Description
0	<tz> includes no adjustment for Daylight Saving Time
1	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 value representing 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 at the time of delivering time zone information and will be present in the extended time zone reporting unsolicited result code if provided by the network.

## 1.24 PCCA STD 101 [17] Select Wireless Network: +WS46

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 1.24.1 Syntax

Command	Possible Response(s)
AT+WS46<n>	
AT+WS46?	<n>
AT+WS46=?	<i>[list of supported &lt;n&gt;s]</i>

### 1.24.2 Description

Set command selects the WDS side stack <n>to be used by the TA. Read command shows current setting and test command displays side stacks implemented in the TA.



## 1.24.3 Defined Values

### **n (Query)**

Integer. The values in <n> for Query are mutually exclusive. If one value (e.g. "25") is returned, other values shall not be returned.

**Table 1-31:** *n (Query)*

Value	Description
12	GSM Digital Cellular Systems (GERAN only)
22	UTRAN only
25	3GPP Systems (GERAN, UTRAN and E-UTRAN)
28	E-UTRAN only
29	GERAN and UTRAN
30	GERAN and E-UTRAN
31	UTRAN and E-UTRAN

### **n (Set)**

Integer. Refer PCCA STD 101 [17] for other values.

**Table 1-32:** *n (Set)*

Value	Description
12	3GPP System
22	Not used. If received, the value shall be treated as if 12 had been received or an ERROR shall be returned.
25	
28	
29	
30	
31	

# 2

## 3GPP Mobile Termination Control and Status Commands

### 2.1 Close Logical Channel: +CCHC

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

#### 2.1.1 Syntax

Command	Possible Response(s)
AT+CCHC=<sessiondd>	+CCHC +CME ERROR: <err>
AT+CCHC=?	+CME ERROR: <err>

#### 2.1.2 Description

This command asks the ME to close a communication session with the active UICC. The ME shall close the previously opened logical channel. The TE will no longer be able to send commands on this logical channel. The UICC will close the logical channel when receiving this command.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.1.3 Defined Values

### **sessionid**

Integer type value, a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism

## 2.2 Open Logical Channel: +CCHO

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 2.2.1 Syntax

Command	Possible Response(s)
AT+CCHO=<dfname>	<sessionid> +CME ERROR: <err>
AT+CCHO=?	+CME ERROR: <err>

### 2.2.2 Description

Execution of the command causes the MT to return <sessionid> to allow the TE to identify a channel that is being allocated by the currently selected UICC, which is attached to ME. The currently selected UICC will open a new logical ETSI 3GPP TS 27.007 version 12.10.0 Release 12 141 ETSI TS 127 007 V12.10.0 (2015-10) channel; select the application identified by the <dfname> received with this command and return a session Id as the response. The ME shall restrict the communication between the TE and the UICC to this logical channel.

This <sessionid> is to be used when sending commands with Restricted UICC Logical Channel access +CRLA or [Generic UICC Logical Channel Access: +CGLA](#) commands.

---

**Note:** The logical channel number is contained in the CLASS byte of an APDU command, thus implicitly contained in all APDU commands sent to a UICC. In this case it will be up to the MT to manage the logical channel part of the APDU CLASS byte and to ensure that the chosen logical channel is relevant to the <sessionid> indicated in the AT command. See 3GPP TS 31.101 [65] for further information on logical channels in APDU commands protocol.

---

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.2.3 Defined Values

### **dfname**

All selectable applications in the UICC are referenced by a DF name coded on 1 to 16 bytes

### **sessionid**

Integer type value, a session Id to be used in order to target a specific application on the smart card (e.g. (U)SIM, WIM, ISIM) using logical channels mechanism

## 2.3 Extended Error Report: +CEER

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 2.3.1 Syntax

Command	Possible Response(s)
AT+CEER	+CEER: <report>
AT+CEER=?	

### 2.3.2 Description

Execution command causes the TA to return one or more lines of information text <report>, determined by the MT manufacturer, which should offer the user of the TA an extended report of the reason for:

- the failure in the last unsuccessful call setup (originating or answering) or in call modification;
- the last call release;
- the last unsuccessful GPRS attach or unsuccessful PDP context activation;
- the last GPRS detach or PDP context deactivation.

Typically, the text will consist of a single line containing the cause information given by GSM/UMTS network in textual format.

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

### 2.3.3 Defined Values

**report**

Integer. The total number of characters, including line terminators, in the information text shall not exceed 2041 characters. Text shall not contain the sequence 0<CR> or OK<CR>.

## 2.4 Set Phone Functionality: +CFUN

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
 See the current implementation limitation in fun parameter description.

---

### 2.4.1 Syntax

Command	Possible Response(s)
AT+CFUN=[<fun>[,<rst>]]	+CME ERROR: <err>
AT+CFUN?	+CFUN: <fun> or +CME ERROR: <err>
AT+CFUN=?	+CFUN: (list of supported <fun>s),(list of supported <rst>s)

### 2.4.2 Description

Set command selects the level of functionality <fun> in the MT. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, MT resetting with <rst> parameter may be utilized.

---

**Note:** It is manufacturer specific if this command affects network registration. Command Operator Selection +COPS is used to force registration/deregistration.

---

Test command returns values supported by the MT as a compound value.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.4.3 Defined Values

---

<b>Caution:</b>	<b>Restriction: only functionality levels 0, 1, and 4? can be set:</b> <ul style="list-style-type: none"> <li>• <b>AT+CFUN=0</b> is used to configure the minimum functionality level</li> <li>• <b>AT+CFUN=1</b> is used to configure the full functionality level</li> <li>• <b>AT+CFUN=4</b> is used to disable both transmit and receive RF circuits. In this mode, access to the SIM card is allowed</li> </ul>
-----------------	--

---

**fun**  
Integer. Functionality code.

**Table 2-1:** *fun*

Value	Description
0	minimum functionality
1	full functionality
2	disable phone transmit RF circuits only
3	disable phone receive RF circuits only
4	disable phone both transmit and receive RF circuits
5..127	reserved for manufacturers as intermediate states between full and minimum functionality

**rst**  
Integer. Reset required indication.

**Table 2-2:** *rst*

Value	Description
0	do not reset the MT before setting it to <fun> power level Note: This shall be always default when <rst> is not given.
1	reset the MT before setting it to <fun> power level



## 2.5 Generic UICC Logical Channel Access: +CGLA

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 2.5.1 Syntax

Command	Possible Response(s)
AT+CGLA=<sessionid>,<length>,<command>	+CGLA: <length>, <response> +CME ERROR: <err>
AT+CGLA=?	+CME ERROR: <err>

### 2.5.2 Description

Set command transmits to the MT the <command> it then shall send as it is to the selected UICC. In the same manner the UICC <response> shall be sent back by the MT to the TA as it is.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

This command allows a direct control of the currently selected UICC by a distant application on the TE. The TE shall then take care of processing UICC information within the frame specified by GSM/UMTS.

Although Generic UICC Logical Channel Access command +CGLA allows TE to take control over the UICC-MT interface, there are some functions of the UICC-MT interface that logically do not need to be accessed from outside the TA/MT. Moreover, for security reason the GSM network authentication should not be handled outside the TA/MT. Therefore it shall not be allowed to execute a Run GSM Algorithm command or an Authenticate command in GSM ETSI 3GPP TS 27.007 version 12.10.0 Release 12 139 ETSI TS 127 007 V12.10.0 (2015-10) context from the TE using +CGLA at all time whether the +CGLA is locked or unlocked. This shall not forbid the TE to send Authenticate commands in other security contexts (e.g. EAP security context).

For example, the TA/MT shall forbid the transfer of the Authenticate command to a USIM application when parameters P2 = 0 (GSM security context). See 3GPP TS 31.102 [59] for USIM authenticate command definition.

---

**Note:** Compared to Restricted UICC Access command +CRLA, the definition of +CGLA allows TE to take more control over the UICC-MT interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking.

---

## 2.5.3 Defined Values

### **sessionid**

integer type; this is the identifier of the session to be used in order to send the APDU commands to the UICC. It is mandatory in order to send commands to the UICC when targeting applications on the smart card using a logical channel other than the default channel (channel "0").

### **length**

integer type; length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response)

### **command**

command passed on by the MT to the UICC in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer [Select TE Character Set: +CSCS](#))

### **response**

response to the command passed on by the UICC to the MT in the format as described in 3GPP TS 31.101 [65] (hexadecimal character format; refer [Select TE Character Set: +CSCS](#))

## 2.6 Printing IP Address Format: +CGPIAF

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 2.6.1 Syntax

Command	Possible Response(s)
<b>AT+CGPIAF</b> =[<IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>]]]	
<b>AT+CGPIAF?</b>	+CGPIAF:<IPv6_AddressFormat>,<IPv6_SubnetNotation>,<IPv6_LeadingZeros>,<IPv6_CompressZeros>
<b>AT+CGPIAF=?</b>	+CGPIAF:(list of supported <IPv6_AddressFormat>s),(list of supported <IPv6_SubnetNotation>s),(list of supported <IPv6_LeadingZeros>s),(list of supported <IPv6_CompressZeros>s)

### 2.6.2 Description

Set command decides what format to print IPV6 address parameters of other AT commands. See RFC 4291 [88] for details of the IPv6 address format.

The +CGPIAF parameters <IPv6\_AddressFormat>, <IPv6\_SubnetNotation>, <IPv6\_LeadingZeros> and <IPv6\_CompressedZeros> affect the following commands and parameters:

1. in +CGTFT and +CGTFTRDP, the <remote address and subnet mask>;
2. in +CGDCONT, the <PDP\_addr>;
3. in +CGPADDR, the <PDP\_addr\_1> and <PDP\_addr\_2>;
4. in +CGCONTRDP, the <local address and subnet mask>, <DNS\_prim\_addr>, <DNS\_sec\_addr>, <P\_CSCF\_prim\_addr> and <P\_CSCF\_sec\_addr>; and
5. in +CRC, the <PDP\_addr> of unsolicited result code GPRS <PDP\_type>, <PDP\_addr>[, [<L2P>] [, <APN>]]].



### IPv6\_LeadingZeros

Integer type, decides whether leading zeros are omitted or not. Setting does not apply if <IPv6\_AddressFormat> = 0.

**Table 2-5:** *IPv6\_LeadingZeros*

Value	Description
0	Leading zeros are omitted.Example: "2001:DB8:0:CD30:0:0:0:0"
1	Leading zeros are included.Example:"2001:0DB8:0000:CD30:0000:0000:0000"

### IPv6\_CompressZeros

Integer type, decides whether 1-n instances of 16-bit zero-values are replaced by only '::'. This applies only once. Setting does not apply if <IPv6\_AddressFormat> = 0.

**Table 2-6:** *IPv6\_CompressZeros*

Value	Description
0	No zero compression.Example:"2001:DB8:0:CD30:0:0:0:0"
1	Use zero compression.Example:"2001:DB8:0:CD30::"

## 2.7 Mobile Termination Error Result Code: +CME ERROR

**Note:** This command is described in 3GPP TS 27.007, the error codes reported here are from 3GPP TS 27.007 and 3GPP TS 27.005. See Section *References*.

### 2.7.1 Syntax

Command	Possible Response(s)
	+CME ERROR: <err>

### 2.7.2 Description

The operation of +CME ERROR: <err> final result code is similar to the regular ERROR result code: if +CME ERROR: <err> is the result code for any of the commands in a command line, none of the following commands in the same command line is executed (neither ERROR nor OK result code shall be returned as a result of a completed command line execution). The format of <err> can be either numeric or verbose. This is set with command +CMEE, see Section [2.9 Report Mobile Termination Error: +CMEE](#) on page 71.

### 2.7.3 CME/CMS Error Defined Values

**err**

Integer. Error code.

**Table 2-7:** General "CME ERROR" Codes (3GPP TS 27.007)

Code	Description
0	phone failure
1	no connection to phone
2	phone adaptor link reserved

**Table 2-7:** General "CME ERROR" Codes (3GPP TS 27.007) (Continued)

Code	Description
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 (see note1)
11	SIM PIN required
12	SIM PUK required
13	SIM failure (See NOTE 1)
14	SIM busy (See NOTE 1)
15	SIM wrong (See NOTE 1)
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

**Table 2-7:** General "CME ERROR" Codes (3GPP TS 27.007) (Continued)

Code	Description
40	network personalization PIN required
41	network personalization PUK required
42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
48	hidden key required (See NOTE 2)
49	EAP method not supported
50	Incorrect parameters
60	System failure
100	unknown
126	Operation temporarily not allowed
528	Upgrade failed: General error
529	Upgrade failed: Corrupted image.
530	Upgrade failed: Invalid signature
531	Upgrade failed: Network error
532	Upgrade failed: Upgrade already in progress
533	Upgrade cancel failed: No upgrade in progress
540	HW configuration failed: General error
541	HW configuration failed: Invalid function
542	HW configuration failed: Invalid function parameter
543	HW configuration failed: pin(s) already assigned to another function

Note 1: This error code is also applicable to UICC.



Note 2: This key is required when accessing hidden phonebook entries.

**Table 2-8:** GPRS related "CME ERROR" Codes (3GPP TS 27.007)

<b>Code</b>	<b>Description</b>
103	Illegal MS (#3)
106	Illegal ME (#6)
107	GPRS services not allowed (#7)
111	PLMN not allowed (#11)
112	Location area not allowed (#12)
113	Roaming not allowed in this location area (#13)
133	requested service option not subscribed (#33)
134	service option temporarily out of order (#34)
149	PDP authentication failure
150	invalid mobile class
151	VBS/VGCS not supported by the network
152	No service subscription on SIM
153	No subscription for group ID
154	Group Id not activated on SIM
155	No matching notification
156	VBS/VGCS call already present
157	Congestion
158	Network failure
159	Uplink busy
160	No access rights for SIM file
161	No subscription for priority
162	operation not applicable or not possible
163	Group Id prefixes not supported

**Table 2-8:** GPRS related "CME ERROR" Codes (3GPP TS 27.007) (Continued)

Code	Description
164	Group Id prefixes not usable for VBS
165	Group Id prefix value invalid
171	Last PDN disconnection not allowed (#49)
132	service option not supported (#32)
148	unspecified GPRS error

Note: Values in parentheses are 3GPP TS 24.008 [8] cause codes.

**Table 2-9:** SMS related "CMS ERROR" Codes (3GPP TS 27.005)

Code	Description
0...127	3GPP TS 24.011 [6] clause E.2 values
128...255	3GPP TS 23.040 [3] clause 9.2.3.22 values.
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	(U)SIM not inserted
311	(U)SIM PIN required
312	PH-(U)SIM PIN required
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required

**Table 2-9:** SMS related "CMS ERROR" Codes (3GPP TS 27.005) (Continued)

Code	Description
318	(U)SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
500	unknown error
...511	other values in range 256...511 are reserved
512...	manufacturer specific

## 2.8 Mobile Termination Control Mode: +CMEC

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.  
See the current implementation limitation in the parameters description.

---

### 2.8.1 Syntax

Command	Possible Response(s)
<b>AT+CMEC</b> =[<keyp>[,<disp>[,<ind>[,<tscrn>]]]]	+CME ERROR: <err>
<b>AT+CMEC?</b>	+CMEC : <keyp>,<disp>,<ind>,<tscrn>
<b>AT+CMEC=?</b>	+CMEC : (list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <tscrn>s)

### 2.8.2 Description

Set command selects the equipment, which operates MT keypad, writes to MT display and sets MT indicators. If operation mode is not allowed by the MT, +CME ERROR: <err> is returned.

Test command returns the modes supported as compound values.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.8.3 Defined Values

---

**Caution:** Restriction: only the following parameters are currently supported:

- <keypd>: '0'
  - <disp>: '0'
  - <ind>: '0'
  - <tscrn>: '0'
- 

**keyp**  
Integer.

**Table 2-10:** *keyp*

Value	Description
0	MT can be operated only through its keypad (execute command of +CKPD cannot be used)
1	MT can be operated only from TE (with command +CKPD)
2	MT can be operated from both MT keypad and TE

**disp**  
Integer.

**Table 2-11:** *disp*

Value	Description
0	only MT can write to its display (command +CDIS can only be used to read the display)
1	only TE can write to MT display (with command +CDIS)
2	MT display can be written by both MT and TE

**ind**  
Integer.

**Table 2-12:** *ind*

Value	Description
0	only MT can set the status of its indicators (command +CIND can only be used to read the indicators)
1	only TE can set the status of MT indicators (with command +CIND)
2	MT indicators can be set by both MT and TE

**tscrn**  
Integer.

**Table 2-13:** *tscrn*

Value	Description
0	only MT can set the status of its indicators (execute command of +CTSA cannot be used)
1	only TE can set the status of MT indicators (with command +CTSA)
2	MT indicators can be set by both MT and TE

## 2.9 Report Mobile Termination Error: +CMEE

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 2.9.1 Syntax

Command	Possible Response(s)
AT+CMEE=<n>	+CME ERROR: <err>
AT+CMEE?	+CMEE: <n>
AT+CMEE=?	+CMEE: (list of supported <n>s)

### 2.9.2 Description

Set command disables or enables the use of final result code +CME ERROR: <err> as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Test command returns values supported as a compound value.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.9.3 Defined Values

**n**

Integer. Defines the use of final result code.

**Table 2-14:** *n*

Value	Description
0	disable +CME ERROR: <err> result code and use ERROR instead
1	enable+CME ERROR: <err> result code and use numeric <err> values
2	enable +CME ERROR: <err> result code and use verbose<err> values



## 2.10 Mobile Termination Event Reporting: +CMER

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
See the current implementation limitation in the parameters description.

---

### 2.10.1 Syntax

Command	Possible Response(s)
<b>AT+CMER</b> =[<mode>[,<keyp>[,<disp>[,<ind>[,<bfr>[,<tscrn>][, <orientation>]]]]]]	+CME ERROR: <err>
<b>AT+CMER?</b>	+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>,<tscrn>,<orientation>
<b>AT+CMER=?</b>	+CMER: (list of supported <mode>s),(list of supported <keyp>s),(list of supported <disp>s),(list of supported <ind>s),(list of supported <bfr>s),(list of supported <tscrn>s),(list of supported <orientation>s)

### 2.10.2 Description

Set command enables or disables sending of unsolicited result codes from TA to TE in the case of key pressings, display changes, and indicator state changes. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1, 2 or 3 is entered. If setting is not supported by the MT, +CME ERROR: <err> is returned.

Test command returns the modes supported as compound values.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.10.3 Defined Values

**Caution:** Restriction: only the following parameters are supported:

- <mode>: '3'
- <keyp>: '0'
- <disp>: '0'
- <ind>: '0' or '1' or '2'

When <ind> is set to '1' or '2', the notification +CIEV is used (when supported). Only the notifications 'SERVICE', 'SMS FULL' and 'ROAMING' are supported. 'SMS FULL' is a proprietary notification.

- <bfr>: '0'
- <tscrn>: '0'

**mode**

Integer.

**Table 2-15:** *mode*

Value	Description
0	buffer unsolicited result codes in the TA; if TA result code buffer is full, codes can be buffered in some other place or the oldest ones can be discarded
1	discard 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
3	forward unsolicited result codes directly to the TE; TA TE link specific inband technique used to embed result codes and data when TA is in on line data mode

**keyp**  
Integer.

**Table 2-16:** *keyp*

Value	Description
0	no keypad event reporting
1	keypad event reporting using unsolicited result code +CKEV: <key>,<press>. <key> indicates the key (refer IRA values defined in table 67 in subclause "Keypad control +CKPD") and <press> if the key is pressed or released (1 for pressing and 0 for releasing). Only those key pressings, which are not caused by +CKPD shall be indicated by the TA to the TE. NOTE 1: When this mode is enabled, corresponding result codes of all keys currently pressed are flushed to the TA regardless of <bfr> setting.
2	keypad event reporting using unsolicited result code +CKEV: <key>,<press>. All key pressings shall be directed from TA to TE. NOTE 2: When this mode is enabled, corresponding result codes of all keys currently pressed are flushed to the TA regardless of <bfr> setting.

**disp**  
Integer.

**Table 2-17:** *disp*

Value	Description
0	no display event reporting
1	display event reporting using unsolicited result code +CDEV: <elem>,<text>. <elem> indicates the element order number (as specified for +CDIS) and <text> is the new value of text element. Only those display events, which are not caused by +CDIS shall be indicated by the TA to the TE. Character set used in <text> is as specified by command Select TE Character Set +CSCS
2	display event reporting using unsolicited result code +CDEV: <elem>,<text>. All display events shall be directed from TA to TE. Character set used in <text> is as specified by command Select TE Character Set +CSCS

**ind**

Integer. Event indicator.

**Table 2-18:** *ind*

Value	Description
0	no indicator event reporting
1	indicator event reporting using unsolicited result code +CIEV: <ind>,<value>. <ind> (when supported) indicates the indicator order number (as specified for +CIND) and <value> is the new value of indicator. Only those indicator events, which are not caused by +CIND shall be indicated by the TA to the TE
2	indicator event reporting using unsolicited result code +CIEV: <ind>,<value> (when supported). All indicator events shall be directed from TA to TE

**bfr**

Integer.

**Table 2-19:** *bfr*

Value	Description
0	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered
1	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes)

**tscrn**

Integer. Touch screen event.

**Table 2-20:** *tscrn*

Value	Description
0	no touch screen event reporting
1	touch screen event reporting using unsolicited result code +CTEV: <action>,<x>,<y>. The <x>,<y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), and <action>indicates the action performed on the screen (0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE.NOTE 3:When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.

**Table 2-20:** *tscrn* (Continued)

Value	Description
2	touch screen event reporting using unsolicited result code +CTEV: <action>, <x>, <y>. All touch screen events shall be directed from the TA to the TE. NOTE 4: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
3	Verbose mode. Touch screen event reporting using unsolicited result code +CTEV: <action>, <x>, <y>. This is a special mode where intermediate depressed result codes (+CTEV: 1, <x>, <y>) are generated for each new <x>, <y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 5: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
4	enhanced touch screen event reporting using unsolicited result code +CTEV: <action>, <x>, <y>, <id>[, <duration>]. The <x>, <y> parameters indicate the x, y coordinates on the touch screen device (as specified for +CTSA), the <duration> parameter indicates the duration of the touch (as specified for +CTSA) and, the <id> identifies any simultaneous touch (as specified for +CTSA). Only those touch screen events, which are not caused by +CTSA shall be indicated by the TA to the TE. The <action> parameter indicates the action performed on the screen, if the <duration> parameter is: - 0, it is valid for the <action> parameter to indicate 0 for screen released, 1 for screen depressed, 2 for single tap, and 3 for double tap; a positive, non-zero integer, it is valid for the <action> parameter to indicate 0 for screen released. NOTE 6: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
5	enhanced touch screen event reporting using unsolicited result code +CTEV: <action>, <x>, <y>, <id>[, <duration>]. See description of <tscrn> set to 4 for the valid for the <action> parameter. All touch screen events shall be directed from the TA to the TE. NOTE 7: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.
6	Verbose mode. enhanced touch screen event reporting using unsolicited result code +CTEV: <action>, <x>, <y>, <id>[, <duration>]. This is a special mode where intermediate depressed result codes (+CTEV: 1, <x>, <y>, <id>[, <duration>]) are generated for each new <x>, <y> coordinate detected while a user is dragging a touch to a new location. All other touch screen actions shall be directed from the TA to the TE normally. See description of <tscrn> set to 4 for the valid for the <action> parameter. Only those touch screen events which are not caused by +CTSA shall be indicated by the TA to the TE. NOTE 8: When this mode is enabled, corresponding result codes of all touch screen actions are flushed to the TA regardless of <bfr> setting.

**orientation**

Integer. Parameter to enable display orientation event reporting from the TA to the TE, using unsolicited result code +COEV: <CurrentTopSide>. The <CurrentTopSide> parameter indicates the top of the ME's screen (as specified for +CSO).

**Table 2-21:** *orientation*

Value	Description
0	No display orientation event reporting.
1	Only those display orientation events, which are not caused by +CSO shall be indicated.
2	All display orientation events shall be indicated.

## 2.11 Phone Activity Status: +CPAS

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

### 2.11.1 Syntax

Command	Possible Response(s)
AT+CPAS	+CPAS : <pas> +CME ERROR : <err>
AT+CPAS=?	+CPAS : list of supported <pas>s +CME ERROR : <err>

### 2.11.2 Description

Execution command returns the activity status <pas> of the MT. It can be used to interrogate the MT before requesting action from the phone.

Test command returns values supported by the MT as a compound value.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.11.3 Defined Values

**pas**

Integer.

---

**Note:** Only values 0, 4 and 5 are supported. All other values are reserved.

---



---

**Caution:** The 0, 4 and 5 values are currently implemented. All other values are reserved.

---

**Table 2-22:** *pas*

Value	Description
0	ready (MT allows commands from TA/TE)
1	unavailable (MT does not allow commands from TA/TE)
2	unknown (MT is not guaranteed to respond to instructions)
3	ringing (MT is ready for commands from TA/TE, but the ringer is active)
4	call in progress (MT is ready for commands from TA/TE, but a call is in progress)
5	asleep (MT is unable to process commands from TA/TE because it is in a low functionality state)
6..128	Reserved



## 2.12 Power Saving Mode Setting: +CPSMS

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 2.12.1 Syntax

Command	Possible Response(s)
+CPSMS=[<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READYtimer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]]	OK +CME ERROR: <err>
+CPSMS?	+CPSMS : <mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READYtimer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]
+CPSMS=?	+CPSMS : (list of supported <mode>s),(list of supported <Requested_Periodic-RAU>s),(list of supported <Requested_GPRS-READY-timer>s),(list of supported <Requested_Periodic-TAU>s),(list of supported <Requested_Active-Time>s)

### 2.12.2 Description

The set command controls the setting of the UEs power saving mode (PSM) parameters. The command controls whether the UE wants to apply PSM or not, as well as the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in E-UTRAN and the requested Active Time value. See the unsolicited result codes provided by commands +CGREG for the Active Time value, the extended periodic RAU value and the GPRS READY timer value that are allocated to the UE by the network in GERAN/UTRAN and +CEREG for the Active Time value and the extended periodic TAU value that are allocated to the UE by the network in E-UTRAN.

A special form of the command can be given as +CPSMS= (with all parameters omitted). In this form, the parameter <mode> will be set to 0, the use of PSM will be disabled and data for all parameters in command +CPSMS will be removed or, if available, set to the manufacturer specific default values.

The read command returns the current parameter values.

The test command returns the supported <mode>s and the value ranges for the requested extended periodic RAU value and the requested GPRS READY timer value in GERAN/UTRAN, the requested extended periodic TAU value in EUTRAN and the requested Active Time value as compound values.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

## 2.12.3 Defined Values

### mode

Integer type. Indication to disable or enable the use of PSM in the UE.

**Table 2-23:** *mode*

Value	Description
0	Disable the use of PSM
1	Enable the use of PSM

### Requested\_Periodic-RAU

string type; one byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN/UTRAN. The requested extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.

### Requested\_GPRS-READY-timer

string type; one byte in an 8 bit format. Requested GPRS READY timer value (T3314) to be allocated to the UE in GERAN/UTRAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008 [8] Table 10.5.172/3GPP TS 24.008. See also 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.

### **Requested\_Periodic-TAU**

string type; one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82]. The default value is set to 180 s.

### **Requested\_Active-Time**

string type; one byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149], 3GPP TS 23.060 [47] and 3GPP TS 23.401 [82]. The default value is set to 60 s.

# 3

## 3GPP Commands for Packet Domain

### 3.1 UE Modes of Operation for EPS: +CEMODE

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
See the current implementation limitation in mode parameter description.

---

#### 3.1.1 Syntax

Command	Possible Response(s)
AT+CEMODE	+CME ERROR: <err>
AT+CEMODE?	+CEMODE: <mode>
AT+CEMODE=?	+CEMODE: (list of supported <mode>s)

#### 3.1.2 Description

The set command is used to set the MT to operate according to the specified mode of operation for EPS, see 3GPP TS 24.301 [83]. If the requested mode of operation is not supported, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

The read command returns the mode of operation set by the TE, independent of the current serving cell capability and independent of the current serving cell Access Technology.

The test command is used for requesting information on the supported MT mode of operation.

### 3.1.3 Defined Values

---

**Caution:** Only <mode> 0 and 2 are currently implemented.

---

**mode**

Integer. Indicates the mode of operation.

**Table 3-1:** *mode*

Value	Description
0	PS mode 2 of operation
1	CS/PS mode 1 of operation
2	CS/PS mode 2 of operation
3	PS mode 1 of operation

NOTE:the definition for UE modes of operation can be found in 3GPP TS 24.301 [83]

## 3.2 EPS Network Registration Status: +CEREG

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.2.1 Syntax

Command	Possible Response(s)
AT+CEREG=<n>	+CME ERROR: <err>
AT+CEREG?	When <n>=0, 1, 2 or 3 and command successful: +CEREG: <n>,<stat>[, [<tac>], [<ci>], [<AcT>], [<cause_type>], <reject_cause>]]] When <n>=4 or 5 and command successful: +CEREG: <n>,<stat>[, [<lac>], [<ci>], [<AcT>], [<rac>], [<cause_type>], [<reject_cause>]], [<Active-Time>], [<Periodic-TAU>]]]]
AT+CEREG=?	+CEREG: (list of supported <n>s))

### 3.2.2 Description

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status 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. The parameters <AcT>, <tac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [, <cause\_type>, <reject\_cause>], when available, when the value of <stat> changes.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

**Note:** If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CEREG command and +CEREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>, <ci> and

<AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [, <cause\_type>, <reject\_cause>], if available, are returned when <n>=3.

Test command returns values supported as a compound value.

### 3.2.3 Defined Values

**n**  
 Integer.

**Table 3-2:** *n*

Value	Description
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>]]
3	enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[, [<tac>], [<ci>], [<AcT>] [, <cause_type>, <reject_cause>]]
4	For a UE that wants to apply PSM, enable network registration and location information unsolicited result code +CEREG: <stat>[, [<tac>], [<ci>], [<AcT>] [, [, [, [<Active-Time>], [<Periodic-TAU>]]]]
5	For a UE that wants to apply PSM, enable network registration, location information and EMM cause value information unsolicited result code +CEREG:<stat>[, [<tac>], [<ci>], [<AcT>] [, [<cause_type>], [<reject_cause>] [, [, [<Active-Time>], [<Periodic-TAU>]]]]

**stat**  
 Integer. Indicates the EPS registration status.

**Table 3-3:** *stat*

Value	Description
0	not registered, MT is not currently searching an operator to register to
1	registered, home network

**Table 3-3: *stat*** (Continued)

Value	Description
2	not registered, but MT is currently trying to attach or searching an operator to register to
3	registration denied
4	unknown (e.g. out of E-UTRAN coverage)
5	registered, roaming
6	registered for "SMS only", home network (not applicable)
7	registered for "SMS only", roaming (not applicable)
8	attached for emergency bearer services only (See NOTE 2)
9	registered for "CSFB not preferred", home network (not applicable)
10	registered for "CSFB not preferred", roaming (not applicable)

NOTE 2:3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services.

**tac**

String type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).

**ci**

String type; four byte E-UTRAN cell ID in hexadecimal format

**AcT**

Integer. The parameter sets/shows the access technology of the serving cell.

**Table 3-4: *AcT***

Value	Description
0	GSM (not applicable)
1	GSM Compact (not applicable)
2	UTRAN (not applicable)
3	GSM w/EGPRS (see NOTE 3) (not applicable)
4	UTRAN w/HSDPA (see NOTE 4) (not applicable)
5	UTRAN w/HSUPA (see NOTE 4) (not applicable)



**Table 3-4:** *AcT* (Continued)

Value	Description
6	UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable)
7	E-UTRAN

NOTE 3:3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 4:3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

**cause\_type**

Integer. Indicates the type of <reject\_cause>.

**Table 3-5:** *cause\_type*

Value	Description
0	Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A.
1	Indicates that <reject_cause> contains a manufacturer-specific cause.

**reject\_cause**

Integer type; contains the cause of the failed registration. The value is of type as defined by <cause\_type>.

**Active-Time**

string type; one byte in an 8 bit format. Indicates the Active Time value (T3324) allocated to the UE in E-UTRAN. The Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].

**Periodic-TAU**

string type; one byte in an 8 bit format. Indicates the extended periodic TAU value (T3412) allocated to the UE in E-UTRAN. The extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82].

## 3.3 PDP Context Activate or Deactivate: +CGACT

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.3.1 Syntax

Command	Possible Response(s)
AT+CGACT=[<state>[,<cid>[,<cid>[,...]]]]	+CME ERROR: <err>
AT+CGACT?	+CGACT: [<cid>,<state>] [<CR><LF>+CGACT: <cid>,<state> [...]]
AT+CGACT=?	+CGACT: (list of supported <state>s)

### 3.3.2 Description

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

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

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

**Note:** If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

For EPS, the activation request for an EPS bearer resource will be answered by the network by either an EPS dedicated bearer activation or EPS bearer

modification request. The request must be accepted by the MT before the PDP context can be set in to established state.

If no <cid>s are specified the activation form of the command activates all defined contexts.

If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

---

**Note:** This command has the characteristics of both the V.250 action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

---

### 3.3.3 Defined Values

#### state

Integer. Indicates the state of PDP context activation.

**Table 3-6:** *state*

Value	Description
0	deactivated
1	activated

#### cid

Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

## 3.4 PS Attach or Detach: +CGATT

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 3.4.1 Syntax

Command	Possible Response(s)
AT+CGATT=<state>	+CME ERROR: <err>
AT+CGATT?	+CGATT: <state>
AT+CGATT=?	+CGATT: (list of supported <state>s)

### 3.4.2 Description

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

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

---

**Note:** If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

---

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

The read command returns the current Packet Domain service state.

The test command is used for requesting information on the supported Packet Domain service states.

---

**Note:** This command has the characteristics of both the V.250 action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

---

### 3.4.3 Defined Values

**state**

Integer. Indicates the state of PS attachment.

---

**Note:** AT+CGATT=1 will put the UE in automatic attach mode only if AT+CFUN=1 and until the next AT+CFUN=0.

---

**Table 3-7:** *state*

Value	Description
0	detached
1	attached

## 3.5 Define PDP Context Authentication Parameters: +CGAUTH

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.5.1 Syntax

Command	Possible Response(s)
<b>AT+CGAUTH</b> =<cid>[,<auth_prot>[,<userid>[,<password>]]]	+CME ERROR: <err>
<b>AT+CGAUTH?</b>	[+CGAUTH: <cid>,<auth_prot>,<userid>,<password>] [<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password> [...]]
<b>AT+CGAUTH=?</b>	+CGAUTH: (range of supported <cid>s),(list of supported <auth_prot>s),(range of supported <userid>s),(range of supported <password>s)

### 3.5.2 Description

Set command allows the TE to specify authentication parameters for a PDP context identified by the (local) context identification parameter <cid> used during the PDP context activation and the PDP context modification procedures. Since the <cid> is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, +CGAUTH is effectively as an extension to these commands.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

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

The test command returns values supported as a compound value.

### 3.5.3 Defined Values

**cid**

Integer type. Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

**auth\_prot**

Integer type. Authentication protocol used for this PDP context.

**Table 3-8:** *auth\_prot*

Value	Description
0	None. Used to indicate that no authentication protocol is used for this PDP context. Username and password are removed if previously specified.
1	PAP
2	CHAP

**userid**

String type. User name for access to the IP network.

**password**

String type. Password for access to the IP network.

## 3.6 PDP Context Modify: +CGCMOD

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.6.1 Syntax

Command	Possible Response(s)
AT+CGCMOD[=<cid>[,<cid>[,...]]]	+CME ERROR: <err>
AT+CGCMOD=?	+CGCMOD: (list of <cid>s with active contexts)

### 3.6.2 Description

The execution command is used to modify the specified PDP context (s) with respect to QoS profiles and TFTs. After the command has completed, the MT returns to V.250 online data state. If the requested modification for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

For EPS, the modification request for an EPS bearer resource will be answered by the network by an EPS bearer modification request. The request must be accepted by the MT before the PDP context is effectively changed.

If no <cid>s are specified the activation form of the command modifies all active contexts.

The test command returns a list of <cid>s associated with active contexts.

### 3.6.3 Defined Values

#### cid

Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).



## 3.7 PDP Context Read Dynamic Parameters: +CGCONTRDP

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.7.1 Syntax

Command	Possible Response(s)
AT+CGCONTRDP[=<cid>]	[+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]] [ <i>C R</i> ]<LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr and subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]][...]
AT+CGCONTRDP=?	+CGCONTRDP: (list of <cid>s associated with active contexts)

### 3.7.2 Description

The execution command returns the relevant information <bearer\_id>, <apn>, <local\_addr and subnet\_mask>, <gw\_addr>, <DNS\_prim\_addr>, <DNS\_sec\_addr>, <P-CSCF\_prim\_addr>, <P-CSCF\_sec\_addr>, <IM\_CN\_Signalling\_Flag> and <LIPA\_indication> for an active non secondary PDP context with the context identifier <cid>.

If the MT indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple lines of information per <cid> will be returned.

If the MT has dual stack capabilities, at least one pair of lines with information is returned per <cid>. First one line with the IPv4 parameters followed by one line with the IPv6 parameters. If this MT with dual stack capabilities indicates more than two IP addresses of P-CSCF servers or more than two IP addresses of DNS servers, multiple of such pairs of lines are returned.

**Note:** If the MT doesn't have all the IP addresses to be included in a line, e.g. in case the UE received four IP addresses of DNS servers and two IP addresses of P-CSCF servers, the parameter value representing an IP address that can not be populated is set to an empty string or an absent string.

If the parameter <cid> is omitted, the relevant information for all active non secondary PDP contexts is returned.

The test command returns a list of <cid>s associated with active non secondary contexts.

### 3.7.3 Defined Values

#### **cid**

Integer type; specifies a particular non secondary PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

#### **bearer\_id**

Integer type; identifies the bearer, i.e. the EPS bearer in EPS and the NSAPI in UMTS/GPRS.

#### **apn**

String type; a logical name that was used to select the GGSN or the external packet data network.

#### **local\_addr, subnet\_mask**

String type; shows the IP address and subnet mask of the MT. The string is given as dot-separated numeric (0-255) parameters on the form:

"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4

or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### **gw\_addr**

String type; shows the Gateway Address of the MT. The string is given as dot-separated numeric (0-255) parameters.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### **DNS\_prim\_addr**

String type; shows the IP address of the primary DNS server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### DNS\_sec\_addr

String type; shows the IP address of the secondary DNS server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### P\_CSCF\_prim\_addr

String type; shows the IP address of the primary P-CSCF server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### P\_CSCF\_sec\_addr

String type; shows the IP address of the secondary P-CSCF server.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGCONTRDP.

#### IM\_CN\_Signalling\_Flag

Integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.

**Table 3-9:** *IM\_CN\_Signalling\_Flag*

Value	Description
0	PDP context is not for IM CN subsystem-related signalling only
1	PDP context is for IM CN subsystem-related signalling only

#### LIPA\_indication

Integer type; indicates that the PDP context provides connectivity using a LIPA PDN connection. This parameter cannot be set by the TE.

**Table 3-10:** *LIPA\_indication*

Value	Description
0	indication not received that the PDP context provides connectivity using a LIPA PDN connection
1	indication received that the PDP context provides connectivity using a LIPA PDN connection

## 3.8 Enter Data State: +CGDATA

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 3.8.1 Syntax

Command	Possible Response(s)
AT+CGDATA[=<L2P>[,<cid>[,<cid>[,...]]]]	CONNECT ERROR +CME ERROR:<err>
AT+CGDATA=?	+CGDATA: (list of supported <L2Ps>)

### 3.8.2 Description

The execution command causes the MT to perform whatever actions 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. 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.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

---

**Note:** If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

---

Commands following +CGDATA command in the AT command line shall not be processed by the MT.

The detailed behaviour after the online data state has been entered is dependent on the PDP type. It is described briefly in 3GPP TS 27.060 [34] and in more detail in 3GPP TS 29.061 [39] and the specifications for the relevant PDPs. PS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the [PS Attach or Detach: +CGATT](#) and [PDP Context Activate or Deactivate: +CGACT](#) commands.

If context activation takes place during the PDP startup, one or more <cid>s may be specified in order to provide the information needed for the context activation request(s).

During each PDP startup procedure the MT may have access to some or all of the following information:

- The MT may have a priori knowledge, for example, it may implement only one PDP type.
- The command may have provided an <L2P> parameter value.
- The TE may provide a PDP type and/or PDP address to the MT during in the PDP startup procedure.

If any of this information is in conflict, the command will fail.

Any PDP type and/or PDP address present in the above information shall be compared with the PDP type and/or PDP address in any context definitions specified in the command in the order in which their <cid>s appear. For a context definition to match:

- The PDP type must match exactly.
- The PDP addresses are considered to match if they are identical or if either or both addresses are unspecified. For example, a PPP NCP request specifying PDP type = IP and no PDP address would cause the MT to search through the specified context definitions for one with PDP type = IP and any PDP address.

The context shall be activated using the matched value for PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available then a dynamic address is requested.

If no <cid> is given or if there is no matching context definition, the MT shall attempt to activate the context with whatever information is available to the MT. The other context parameters shall be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer 2 protocol termination procedure has completed successfully, the V.250 command state is re-entered and the MT returns the final result code OK.

In the event of an erroneous termination or a failure to start up, the V.250 command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

The test command is used for requesting information on the supported layer 2 protocols.

This command may be used in both normal and modem compatibility modes.

### 3.8.3 Defined Values

#### cid

Integer. Parameter specifies a particular PDP context definition (see [Define PDP Context: +CGDCONT](#) parameter <cid>).

---

**Note:** If this parameter is omitted, <cid>=3 (Internet PDN) is the default value for all implementations except CAT-M. For CAT-M implementation, <cid>=1 (Internet PDN) is the default value.

---

#### L2P

String. Layer 2 protocol to be used between the TE and MT.

**Table 3-11:** L2P

Value	Description
"PPP"	Layer 2 protocol PPP

Other values are obsolete or specific and are not supported.



## 3.9.2 Description

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

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

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

If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0. As all other contexts, the parameters for <cid>=0 can be modified with +CGDCONT. If the initial PDP context is supported, +CGDCONT=0 resets context number 0 to its particular default settings.

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

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

## 3.9.3 Defined Values

### cid

Integer type; 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 or if the initial PDP context is supported (see subclause 10.1.0), minimum value = 0) is returned by the test form of the command.

---

**Note:** The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.

---



### PDP\_type

String type; specifies the type of packet data protocol

**Table 3-12:** PDP\_type

Value	Description
X.25	ITU-T/CCITT X.25 layer 3 (Obsolete)
IP	Internet Protocol (IETF STD 5 [103])
IPV6	Internet Protocol, version 6 (see RFC 2460 [106])
IPV4V6	Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301 [83])
OSPIH	Internet Hosted Octect Stream Protocol (Obsolete)
PPP	Point to Point Protocol (IETF STD 51 [104])
Non-IP	Transfer of Non-IP data to external packet data network (see 3GPP TS 23.401 [82])

---

**Note:** Only IP, IPV6 and IPV4V6 values are supported for EPS services.

---

### APN

String type; a logical name that is used to select the GGSN or the external packet data network.

If the value is null or omitted, then the subscription value will be requested.

### PDP\_addr

String type; identifies the MT in the address space applicable to the PDP.

If the parameter 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 read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address(es) may be read using the +CGPADDR command.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGDCONT.

---

**Note:** For EPS, this field or the parameter value of the field is omitted.

---

**d\_comp**

Integer type; controls PDP data compression (applicable for SMDCP only)  
 (refer 3GPP TS 44.065 [61])

**Table 3-13:** *d\_comp*

Value	Description
0	off
1	on (manufacturer preferred compression)
2	V.42bis
3	V.44

**h\_comp**

Integer type; controls PDP header compression (refer 3GPP TS 44.065 [61]  
 and 3GPP TS 25.323 [62])

**Table 3-14:** *h\_comp*

Value	Description
0	off
1	on (manufacturer preferred compression)
2	RFC 1144 [105] (applicable for SMDCP only)
3	RFC 2507 [107]
4	RFC 3095 [108] (applicable for PDCP only)

**IPv4AddrAlloc**

Integer type; controls how the MT/TA requests to get the IPv4 address  
 information

**Table 3-15:** *IPv4AddrAlloc*

Value	Description
0	IPv4 Address Allocation through NAS Signalling
1	IPv4 Address Allocated through DHCP

**request\_type**

Integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services.

NOTE 4:If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9.

NOTE 5:A PDP context established for handover of emergency bearer services from a non-3GPP access network has the same status as a PDP context for emergency bearer services.

**Table 3-16:** *request\_type*

Value	Description
0	PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific)
1	DP context is for emergency bearer services
2	PDP context is for new PDP context establishment
3	PDP context is for handover from a non-3GPP access network
4	PDP context is for handover of emergency bearer services from a non-3GPP access network

**P-CSCF\_discovery**

Integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.

**Table 3-17:** *P-CSCF\_discovery*

Value	Description
0	Preference of P-CSCF address discovery not influenced by +CGDCONT
1	Preference of P-CSCF address discovery through NAS Signalling
2	Preference of P-CSCF address discovery through DHCP

### IM\_CN\_Signalling\_Flag\_Ind

Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

**Table 3-18:** *IM\_CN\_Signalling\_Flag\_Ind*

Value	Description
0	UE indicates that the PDP context is not for IM CN subsystem-related signalling only
1	UE indicates that the PDP context is for IM CN subsystem-related signalling only

### NSLPI

Integer type; indicates the NAS signalling priority requested for this PDP context.

NOTE 6: The MT utilises the provide NSLPI information as specified in 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8].

**Table 3-19:** *NSLPI*

Value	Description
0	indicates that this PDP context is to be activated with the value for the low priority indicator configured in the MT.
1	indicates that this PDP context is is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signalling low priority"

### securePCO

Integer type. Specifies if security protected transmission of PCO is requested or not (applicable for EPS only, see 3GPP TS 23.401 [82] subclause 6.5.1.2).

**Table 3-20:** *securePCO*

Value	Description
0	Security protected transmission of PCO is not requested
1	Security protected transmission of PCO is requested

### IPv4\_MTU\_discovery

Integer type; influences how the MT/TA requests to get the IPv4 MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3.

**Table 3-21:** *IPv4\_MTU\_discovery*

Value	Description
0	Preference of IPv4 MTU size discovery not influenced by +CGDCONT
1	Preference of IPv4 MTU size discovery through NAS signalling

### Local\_Addr\_Ind

Integer type; indicates to the network whether or not the MS supports local IP address in TFTs (see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3).

**Table 3-22:** *Local\_Addr\_Ind*

Value	Description
0	indicates that the MS does not support local IP address in TFTs
1	indicates that the MS supports local IP address in TFTs

### Non-IP\_MTU\_discovery

Integer type; influences how the MT/TA requests to get the Non-IP MTU size, see 3GPP TS 24.008 [8] subclause 10.5.6.3.

**Table 3-23:** *Non-IP\_MTU\_discovery*

Value	Description
0	Preference of Non-IP MTU size discovery not influenced by +CGDCONT
1	Preference of Non-IP MTU size discovery through NAS signalling

### Reliable\_Data\_Service

Integer type; indicates whether the UE is using Reliable Data Service for a PDN connection or not, see 3GPP TS 24.301 [83] and 3GPP TS 24.008 [8] subclause 10.5.6.3.

**Table 3-24:** *Reliable\_Data\_Service*

Value	Description
0	Reliable Data Service is not being used for the PDN connection
1	Reliable Data Service is being used for the PDN connection

## 3.10 Define Secondary PDP Context: +CGDSCONT

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.10.1 Syntax

Command	Possible Response(s)
AT+CGDSCONT=[<cid>,<p_cid>[,<d_comp>[,<h_comp>[,<IM_CN_Signalling_Flag_Ind>]]]]	
AT+CGDSCONT?	[+CGDSCONT:<cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind>][<CR><LF>+CGDSCONT:<cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind>[...]]
AT+CGDSCONT=?	+CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),(list of supported <d_comp>s),(list of supported <h_comp>s),(list of supported <IM_CN_Signalling_Flag_Ind>s)

### 3.10.2 Description

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

In EPS the command is used to define traffic flows.

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

**Note:** If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup, see subclause 10.1.0.

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

The test command returns values supported as a compound value.

### 3.10.3 Defined Values

#### cid

Integer type; 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.

---

**Note:** The <cid>s for network-initiated PDP contexts will have values outside the ranges indicated for the <cid> in the test form of the commands +CGDCONT and +CGDSCONT.

---

#### p\_cid

Integer type; specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.

#### d\_comp

Integer type; controls PDP data compression (applicable for SND CP only) (refer 3GPP TS 44.065 [61])

**Table 3-25:** *d\_comp*

Value	Description
0	off
1	on (manufacturer preferred compression)
2	V.42bis
3	V.44

#### h\_comp

Integer type; controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62])

**Table 3-26:** *h\_comp*

Value	Description
0	off
1	on (manufacturer preferred compression)
2	RFC 1144 [105] (applicable for SND CP only)
3	RFC 2507 [107]



**Table 3-26:** *h\_comp* (Continued)

Value	Description
4	RFC 3095 [108] (applicable for PDCP only)

**IM\_CN\_Signalling\_Flag\_Ind**

Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

**Table 3-27:** *IM\_CN\_Signalling\_Flag\_Ind*

Value	Description
0	UE indicates that the PDP context is not for IM CN subsystem-related signalling only
1	UE indicates that the PDP context is for IM CN subsystem-related signalling only

## 3.11 Define EPS Quality Of Service: +CGEQOS

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.11.1 Syntax

Command	Possible Response(s)
AT+CGEQOS=[<cid>[,<QCI>[,<DL_GBR>,<UL_GBR>[,<DL_MBR>,<UL_MBR>]]]]	+CME ERROR:<err>
AT+CGEQOS?	[+CGEQOS:<cid>,<QCI>[,<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>]] [<CR><LF>+CGEQOS:<cid>,<QCI>[,<DL_GBR>,<UL_GBR>], [<DL_MBR>,<UL_MBR>] [...]]
AT+CGEQOS=?	+CGEQOS: (range of supported <cid>s), (list of supported <QCI>s), (list of supported <DL_GBR>s), (list of supported <UL_GBR>s), (list of supported <DL_MBR>s), (list of supported <UL_MBR>s)

### 3.11.2 Description

The set command allows the TE to specify the EPS Quality of Service parameters <cid>, <QCI>, [<DL\_GBR> and <UL\_GBR>] and [<DL\_MBR> and <UL\_MBR>] for a PDP context or Traffic Flows (see 3GPP TS 24.301 [83] and 3GPP TS 23.203 [85]). When in UMTS/GPRS the MT applies a mapping function to UMTS/GPRS Quality of Service.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

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

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

The test command returns the ranges of the supported parameters.

### 3.11.3 Defined Values

#### cid

Integer type; specifies a particular EPS Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).

#### QCI

Integer type; specifies a class of EPS QoS (see 3GPP TS 24.301 [83]).

**Table 3-28:** QCI

Value	Description
0	QCI is selected by network
1 to 4	value range for guaranteed bit rate Traffic Flows
5 to 9	value range for non-guaranteed bit rate Traffic Flows
128 to 254	value range for Operator-specific QCIs

#### DL\_GBR

Integer type; indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

#### UL\_GBR

Integer type; indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

#### DL\_MBR

Integer type; indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

#### UL\_MBR

Integer type; indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

## 3.12 EPS Quality Of Service Read Dynamic Parameters: +CGEQOSRDP

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.12.1 Syntax

Command	Possible Response(s)
AT+CGEQOSRDP	[+CGEQOSRDP:<cid>,<QCI>,<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>],[<DL_AMBR>,<UL_AMBR>] [<CR><LF>+CGEQOSRDP:<cid>,<QCI>,<DL_GBR>,<UL_GBR>],[<DL_MBR>,<UL_MBR>],[<DL_AMBR>,<UL_AMBR>] [...]]
AT+CGEQOSRDP=?	+CGEQOSRDP: (list of <cid>s associated with active contexts)

### 3.12.2 Description

The execution command returns the Quality of Service parameters <QCI>, [<DL\_GBR> and <UL\_GBR>] and [<DL\_MBR> and <UL\_MBR>] of the active secondary or non secondary PDP context associated to the provided context identifier <cid>.

If the parameter <cid> is omitted, the Quality of Service parameters for all secondary and non secondary active PDP contexts are returned.

The test command returns a list of <cid>s associated with secondary or non secondary active PDP contexts.

Parameters of both network and MT/TA initiated PDP contexts will be returned.

## 3.12.3 Defined Values

### cid

Integer type; specifies a particular Traffic Flows definition in EPS and a PDP Context definition in UMTS/GPRS (see the +CGDCONT and +CGDSCONT commands).

### QCI

Integer type; specifies a class of EPS QoS (see 3GPP TS 24.301 [83]).

**Table 3-29: QCI**

Value	Description
0	QCI is selected by network
1 to 4	value range for guaranteed bit rate Traffic Flows
5 to 9	value range for non-guaranteed bit rate Traffic Flows
128 to 254	value range for Operator-specific QCIs

### DL\_GBR

Integer type; indicates DL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

### UL\_GBR

Integer type; indicates UL GBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

### DL\_MBR

Integer type; indicates DL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

### UL\_MBR

Integer type; indicates UL MBR in case of GBR QCI. The value is in kbit/s. This parameter is omitted for a non-GBR QCI (see 3GPP TS 24.301 [83]).

### DL\_AMBR

Integer type; indicates DL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.

### UL\_AMBR

Integer type; indicates UL APN aggregate MBR (see 3GPP TS 24.301 [83]). The value is in kbit/s.

---

**Note:** If multiple lines in a response belong to the same PDN connection they contain the same <DL\_AMBR> <UL\_AMBR> values.

---

## 3.13 Packet Domain Event Reporting: +CGEREP

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.13.1 Syntax

Command	Possible Response(s)
AT+CGEREP=[<mode>[,<bfr>]]	+CME ERROR: <err>
AT+CGEREP?	+CGEREP: <mode>,<bfr>
AT+CGEREP=?	+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)

### 3.13.2 Description

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. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

Read command returns the current mode and buffer settings

Test command returns the modes and buffer settings supported by the MT as compound values.

### 3.13.3 Defined Values

#### **mode**

Integer.

**Table 3-30:** *mode*

Value	Description
0	buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.
1	discard unsolicited result codes when MT TE link is reserved (e.g. in on line data mode); otherwise forward them directly to the TE
2	buffer unsolicited result codes in the MT when MT TE link is reserved (e.g. in on line data mode) and flush them to the TE when MT TE link becomes available; otherwise forward them directly to the TE

#### **bfr**

Integer type

**Table 3-31:** *bfr*

Value	Description
0	MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered
1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)

### 3.13.4 Event Notification URC: +CGEV

1. For network attachment, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW DETACH

The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

- +CGEV: ME DETACH

The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

2. For MT class, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW CLASS <class>

The network has forced a change of MT class. The highest available class is reported (see +CGCLASS in 3GPP 27.007 specification). The format of the parameter <class> is found in command +CGCLASS.

- +CGEV: ME CLASS <class>

The mobile termination has forced a change of MT class. The highest available class is reported (see +CGCLASS in 3GPP 27.007 specification). The format of the parameter <class> is found in command +CGCLASS.

3. For PDP context activation, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW PDN ACT <cid>[,<WLAN\_Offload>]

The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

<WLAN\_Offload>: integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value) and bit 2 (UTRAN offload acceptability value) in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.

**Table 3-32: WLAN\_Offload**

Value	Description
0	offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable.
1	offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode.
2	offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode.
3	offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable.

---

**Note:** This event is not applicable for EPS.

---



- +CGEV: ME PDN ACT  
 <cid> [, <reason> [, <cid\_other>]] [, <WLAN\_Offload>]

The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid\_other> are found in command +CGDCONT. The format of the parameter <WLAN\_Offload> is defined above.

<reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6.

**Table 3-33:** *reason*

Value	Description
0	IPv4 only allowed
1	IPv6 only allowed
2	single address bearers only allowed.
3	single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.

<cid\_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid\_other>.

---

**Note:** For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid\_other> returned to TE.

---

- +CGEV: NW ACT <p\_cid>, <cid>, <event\_type> [, <WLAN\_Offload>]

The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <WLAN\_Offload> is defined above.

<event\_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.

**Table 3-34:** *event\_type*

Value	Description
0	Informational event
1	Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.

- +CGEV: ME ACT <p\_cid>, <cid>, <event\_type> [, <WLAN\_Offload>]

The network has responded to an ME initiated context activation. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event\_type> and <WLAN\_Offload> are defined above.

4. For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

- +CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>]

The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

- +CGEV: NW PDN DEACT <cid> [, <WLAN\_Offload>]

The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. The format of the parameter <WLAN\_Offload> is defined above.

---

**Note:** Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

---

- +CGEV: ME PDN DEACT <cid>

The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in

GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

---

**Note:** Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

---

- +CGEV: NW DEACT <p\_cid>, <cid>, <event\_type>[, <WLAN\_Offload>]

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event\_type> and <WLAN\_Offload> are defined above.

---

**Note:** Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

---

- +CGEV: ME DEACT <p\_cid>, <cid>, <event\_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p\_cid>. The format of the parameters <p\_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event\_type> is defined above.

---

**Note:** Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP\_type>, <PDP\_addr>, [<cid>].

---

5. For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: NW MODIFY <cid>, <change\_reason>, <event\_type>[, <WLAN\_Offload>]

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change\_reason> and <event\_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change\_reason>, <event\_type>, and <WLAN\_Offload> are defined above.

<change\_reason>: integer type; a bitmap that indicates what kind of change occurred. The <change\_reason> value is determined by summing all the applicable bits. For example if both the values of QoS changed (Bit 2) and WLAN\_Offload changed (Bit 3) have changed, then the <change\_reason> value is 6.

---

**Note:** The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN\_Offload> defined above.

---

**Table 3-35:** *change\_reason*

Value	Description
Bit 1	TFT changed
Bit 2	Qos changed
Bit 3	WLAN Offload changed

- +CGEV: ME MODIFY <cid>, <change\_reason>, <event\_type> [, <WLAN\_Offload>]

The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change\_reason> and <event\_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change\_reason>, <event\_type> and <WLAN\_Offload> are defined above.

6. For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:

- +CGEV: REJECT <PDP\_type>, <PDP\_addr>

A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP\_type> and <PDP\_addr> are found in command +CGDCONT.

---

**Note:** This event is not applicable for EPS.

---

- +CGEV: NW REACT <PDP\_type>, <PDP\_addr>, [<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters <PDP\_type>, <PDP\_addr> and <cid> are found in command +CGDCONT.

---

**Note:** This event is not applicable for EPS.

---

## 3.14 Show PDP Address(es): +CGPADDR

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 3.14.1 Syntax

Command	Possible Response(s)
AT+CGPADDR[=<cid>[,<cid>[,...]]]	[+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]]] [<CR><LF>+CGPADDR: <cid>[,<PDP_addr_1>[,<PDP_addr_2>]] [...]]
AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s)

### 3.14.2 Description

The execution 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.

The test command returns a list of defined <cid>s.

### 3.14.3 Defined Values

#### cid

Integer type; specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

#### PDP\_addr\_1, PDP\_addr\_2

Each is a string type 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 and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. Both <PDP\_addr\_1> and <PDP\_addr\_2> are omitted if none is available. Both <PDP\_addr\_1> and <PDP\_addr\_2> are included when both IPv4 and IPv6 addresses are assigned, with <PDP\_addr\_1> containing the IPv4 address and <PDP\_addr\_2> containing the IPv6 address.

The string is given as dot-separated numeric (0-255) parameter of the form:a1.a2.a3.a4 for IPv4 and  
a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16  
for IPv6.

When +CGPIAF is supported, its settings can influence the format of the IPv6 address in parameter <PDP\_addr\_1> or <PDP\_addr\_2> returned with the execute form of +CGPADDR.

---

**Note:** In dual-stack terminals (<PDP\_type> IPV4V6), the IPv6 address will be provided in <PDP\_addr\_2>. For terminals with a single IPv6 stack (<PDP\_type> IPV6) or due to backwards compatibility, the IPv6 address can be provided in parameter <PDP\_addr\_1>.

---

## 3.15 Secondary PDP Context Read Dynamic Parameters: +CGSCONTRDP

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.15.1 Syntax

Command	Possible Response(s)
AT+CGSCONTRDP[=<cid>] ]	[+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>]] [<CR><LF>+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[,<IM_CN_Signalling_Flag>][...]]
AT+CGSCONTRDP=?	+CGSCONTRDP: (list of <cid>s associated with active contexts)

### 3.15.2 Description

The execution command returns <p\_cid>, <bearer\_id> and <IM\_CN\_Signalling\_Flag> for an active secondary PDP context with the context identifier <cid>.

If the parameter <cid> is omitted, the <cid>, <p\_cid>, <bearer\_id> and <IM\_CN\_Signalling\_Flag> are returned for all active secondary PDP contexts.

In EPS, the Traffic Flow parameters are returned.

**Note:** Parameters for UE initiated and network initiated PDP contexts are returned.

The test command returns a list of <cid>s associated with active secondary PDP contexts.

### 3.15.3 Defined Values

**cid**

Integer type; specifies a particular active secondary PDP context or Traffic Flows definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands (see the +CGDCONT and +CGDSCONT commands).

**p\_cid**

Integer type; specifies a particular PDP context definition or default EPS context Identifier which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface (see the +CGDSCONT command).

**bearer\_id**

Integer type; identifies the bearer, EPS Bearer in EPS and NSAPI in UMTS/GPRS.

**IM\_CN\_Signalling\_Flag**

Integer type; shows whether the PDP context is for IM CN subsystem-related signalling only or not.

**Table 3-36:** *IM\_CN\_Signalling\_Flag*

Value	Description
0	PDP context is not for IM CN subsystem-related signalling only
1	PDP context is for IM CN subsystem-related signalling only



## 3.16 Select Service for MO SMS Messages: +CGSMS

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.  
See the current implementation limitation in *service* parameter description.

---

### 3.16.1 Syntax

Command	Possible Response(s)
AT+CGSMS=[<service>]	
AT+CGSMS?	+CGSMS : <service>
AT+CGSMS=?	+CGSMS : (list of supported <service>s)

### 3.16.2 Description

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

### 3.16.3 Defined Values

*Restriction: only <service> 0 and 2 are currently implemented.*

**service**

Integer type; indicates the service or service preference to be used

**Table 3-37:** *service*

Value	Description
0	Packet Domain
1	circuit switched
2	Packet Domain preferred (use circuit switched if GPRS not available)
3	circuit switched preferred (use Packet Domain if circuit switched not available)

## 3.17 Traffic Flow Template: +CGTFT

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.17.1 Syntax

Command	Possible Response(s)
<b>AT+CGTFT</b> =[<cid>,[<packet filter identifier>,<evaluation precedence index>[,<remote address and subnet mask>[,<protocol number (ipv4) / next header (ipv6)>[,<local port range>[,<remote port range>[,<ipsec security parameter index (spi)>[,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>[,<flow label (ipv6)>[,<direction>]]]]]]]]]]]	+CME ERROR: <err>
<b>AT+CGTFT?</b>	[+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>] [<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction> [...]]
<b>AT+CGTFT=?</b>	+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s) [<CR><LF>+CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <remote address and subnet mask>s),(list of supported <protocol number (ipv4) / next header (ipv6)>s),(list of supported <local port range>s),(list of supported <remote port range>s),(list of supported <ipsec security parameter index (spi)>s),(list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s),(list of supported <flow label (ipv6)>s),(list of supported <direction>s) [...]]

## 3.17.2 Description

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060 [47]. A TFT consists of from one and up to 16 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

The set command specifies a Packet Filter that is to be added to the TFT stored in the MT and used for the context identified by the (local) context identification parameter, <cid>. The specified TFT will be stored in the GGSN in UMTS/GPRS and Packet GW in EPS only at activation or MS-initiated modification of the related context. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGTFT command is effectively an extension to these commands. The Packet Filters consist of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGTFT=<cid> causes all of the Packet Filters in the TFT for context number <cid> to become undefined. At any time there may exist only one PDP context with no associated TFT amongst all PDP contexts associated to one PDP address. At an attempt to delete a TFT, which would violate this rule, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

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

The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line. TFTs shall be used for PDP-type IP and PPP only. For PDP-type PPP a TFT is applicable only when IP traffic is carried over PPP. If PPP carries header-compressed IP packets, then a TFT cannot be used.

## 3.17.3 Defined Values

### cid

Integer type. Specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

### PDP\_type

String type. Specifies the type of packet data protocol (see the +CGDCONT command).

### **packet filter identifier**

Integer type. Value range is from 1 to 16. See also 3GPP TS 23.060 [47]

### **evaluation precedence index**

Integer type. The value range is from 0 to 255. See also 3GPP TS 23.060 [47]

### **remote address, subnet mask**

String type. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or

"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the read form of +CGTFT.

### **protocol number (ipv4) / next header (ipv6)**

Integer type. Value range is from 0 to 255.

### **local port range**

String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

### **remote port range**

String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

### **ipsec security parameter index (spi)**

Numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.

### **type of service (tos) (ipv4) and mask, traffic class (ipv6) and mask**

String type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".

### **flow label (ipv6)**

Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.

**direction**

Integer type. Specifies the transmission direction in which the packet filter shall be applied.

**Table 3-38:** *direction*

Value	Description
0	Pre-Release 7 TFT filter (see 3GPP TS 24.008 [8], table 10.5.162)
1	Uplink
2	Downlink
3	Birectional (Up & Downlink)

Some of the above listed attributes may coexist in a Packet Filter while others mutually exclude each other, the possible combinations are shown in 3GPP TS 23.060 [47].

## 3.18 Traffic Flow Template Read Dynamic Parameters: +CGTFTRDP

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 3.18.1 Syntax

Command	Possible Response(s)
AT+CGTFTRDP[=<cid>]	[+CGTFTRDP : <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<NW packet filter Identifier>] [<CR><LF>+CGTFTRDP : <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range> ,<remote port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<flow label (ipv6)>,<direction>,<NW packet filter Identifier> [...]]
AT+CGTFTRDP=?	+CGTFTRDP : (list of <cid>s associated with active contexts)

### 3.18.2 Description

The execution command returns the relevant information about Traffic Flow Template for an active secondary or non secondary PDP context specified by <cid> together with the additional network assigned values when established by the network. If the parameter <cid> is omitted, the Traffic Flow Templates for all active secondary and non secondary PDP contexts are returned.

Parameters of both network and MT/TA initiated PDP contexts will be returned.

The test command returns a list of <cid>s associated with active secondary and non secondary contexts.

### 3.18.3 Defined Values

#### **cid**

Integer type; Specifies a particular secondary or non secondary PDP context definition or Traffic Flows definition (see +CGDCONT and +CGDSCONT commands).

#### **packet filter identifier**

Integer type. The value range is from 1 to 16.

#### **evaluation precedence index**

Integer type. The value range is from 0 to 255.

#### **remote address, subnet mask**

String type. The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16" for IPv6.

When +CGPIAF is supported, its settings can influence the format of this parameter returned with the execute form of +CGTFTRDP.

#### **protocol number (ipv4) / next header (ipv6)**

Integer type. The value range is from 0 to 255.

#### **local port range**

String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

#### **remote port range**

String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".

#### **ipsec security parameter index (spi)**

Numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.

#### **type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask**

String type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".

#### **flow label (ipv6)**

Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.



**direction**

Integer type. Specifies the transmission direction in which the Packet Filter shall be applied.

**Table 3-39:** *direction*

Value	Description
0	Pre Release 7 TFT Filter (see 3GPP TS 24.008 [8], table 10.5.162)
1	Uplink
2	Downlink
3	Bidirectional (Used for Uplink and Downlink)

**NW packet filter Identifier**

Integer type. The value range is from 1 to 16. In EPS the value is assigned by the network when established

NOTE:Some of the above listed attributes can coexist in a Packet Filter while others mutually exclude each other. The possible combinations are shown in 3GPP TS 23.060 [47].

## 3.19 Network Registration: +CREG

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 3.19.1 Syntax

Command	Possible Response(s)
AT+CREG=[<n>]	+CME ERROR: <err>
AT+CREG?	+CREG: <n>,<stat>[, [<lac>], [<ci>], [<AcT>], [<cause_type>,<reject_cause>]]
AT+CREG=?	+CREG: (list of supported <n>s)

### 3.19.2 Description

Set command controls the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the MT's circuit mode network registration status in GERAN/UTRAN/E-UTRAN, or unsolicited result code +CREG: <stat> [, [<lac>], [<ci>], [<AcT>]] when <n>=2 and there is a change of the network cell in GERAN/UTRAN/E-UTRAN. The parameters <AcT>, <lac> and <ci> are sent only if available. The value <n>=3 further extends the unsolicited result code with [, <cause\_type>, <reject\_cause>], when available, when the value of <stat> changes.

---

**Note:** If the MT also supports GPRS services and/or EPS services, the +CGREG command and +CGREG: result codes and/or the +CEREG command and +CEREG: result codes apply to the registration status and location information for those services.

---

Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac>, <ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network. The parameters [, <cause\_type>, <reject\_cause>], if available, are returned when <n>=3.

Test command returns values supported as a compound value.

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 3.19.3 Defined Values

**n**  
 Integer.

**Table 3-40:** *n*

Value	Description
0	disable network registration unsolicited result code
1	enable network registration unsolicited result code +CREG: <stat>
2	enable network registration and location information unsolicited result code +CREG: <stat>[, [<lac>], [<ci>], [<AcT>]]
3	enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[, [<lac>], [<ci>], [<AcT>] [, <cause_type>, <reject_cause>]]

**stat**  
 Integer. Indicates the circuit mode registration status.

**Table 3-41:** *stat*

Value	Description
0	not registered, MT is not currently searching an operator to register to
1	registered, home network
2	not registered, but MT is currently searching a new operator to register to
3	registration denied
4	unknown (e.g. out of GERAN/UTRAN/E-UTRAN coverage)
5	registered, roaming
6	registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)
7	registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)
8	attached for emergency bearer services only (See NOTE 2 below)
9	registered for "CSFB not preferred", home network (not applicable)

**Table 3-41:** *stat* (Continued)

Value	Description
10	registered for "CSFB not preferred", roaming (not applicable)

NOTE 2:3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS is considered as attached for emergency bearer services.

**tac**

String type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal).

**ci**

String type; four byte E-UTRAN cell ID in hexadecimal format

**AcT**

Integer. The parameter sets/shows the access technology of the serving cell.

**Table 3-42:** *AcT*

Value	Description
0	GSM (not applicable)
1	GSM Compact (not applicable)
2	UTRAN (not applicable)
3	GSM w/EGPRS (see NOTE 3) (not applicable)
4	UTRAN w/HSDPA (see NOTE 4) (not applicable)
5	UTRAN w/HSUPA (see NOTE 4) (not applicable)
6	UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable)
7	E-UTRAN

NOTE 3:3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS.

NOTE 4:3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.

NOTE 5: 3GPP TS 44.018 [156] specifies the EC-SCH INFORMATION message which, if present, indicates that the serving cell supports EC-GSM-IoT.

NOTE 6: 3GPP TS 36.331 [86] specifies the System Information blocks which give the information about whether the serving cell supports NB-IoT, which corresponds to E-UTRAN (NB-S1 mode).

**cause\_type**

Integer. Indicates the type of <reject\_cause>.

**Table 3-43:** *cause\_type*

Value	Description
0	Indicates that <reject_cause> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A.
1	Indicates that <reject_cause> contains a manufacturer-specific cause.

**reject\_cause**

Integer type; contains the cause of the failed registration. The value is of type as defined by <cause\_type>.

# 4

## 3GPP SMS Related Commands

### 4.1 Send Command: +CMGC

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

#### 4.1.1 Syntax

Command	Possible Response(s)
if text mode (+CMGF=1): <b>+CMGC</b> =<fo>,<ct>[,<pid>[,<mn>[,<da>[,<tda>]]]]<CR>t ext is entered<ctrl-Z/ESC>	if text mode (+CMGF=1) and sending successful: +CMGC : <mr>[,<scts>] if sending fails:: +CMS ERROR: <err>
AT+CMGC=?	

#### 4.1.2 Description

Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of text (3GPP TS 23.040 [3] TP-Command-Data) is done similarly as specified in command Send Message +CMGS, but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets (refer +CMGS). 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 sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

## 4.2 Delete Message: +CMGD

---

**Note:** This command is described in *3GPP TS 27.005*. See Section *References*.  
See the current implementation limitation in `delflag` parameter description.

---

### 4.2.1 Syntax

Command	Possible Response(s)
<code>AT+CMGD=&lt;index&gt;[,&lt;delflag&gt;]</code>	<code>+CMS ERROR: &lt;err&gt;</code>
<code>AT+CMGD=?</code>	<code>+CMGD: (list of supported &lt;index&gt;s)[,(list of supported &lt;delflag&gt;s)]</code>

### 4.2.2 Description

Execution command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below. If deleting fails, final result code `+CMS ERROR: <err>` is returned.

Test command shows the valid memory locations and optionally the supported values of <delflag>.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

## 4.2.3 Defined Values

**index**

Integer.

**delflag**

Integer. Indicates multiple message deletion request as follows:

---

**Caution:** Only the <delflag> 0 and 4 are currently implemented.

---

**Table 4-1:** *delflag*

Value	Description
0 (or omitted)	Default value if not specified. Delete the message specified in <index>.
1	Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched
2	Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched
3	Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched.
4	Delete all messages from preferred message storage including unread messages.



## 4.3 Message Format: +CMGF

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.3.1 Syntax

Command	Possible Response(s)
AT+CMGF=[<mode>]	
AT+CMGF?	+CMGF : <mode>
AT+CMGF=?	+CMGF : (list of supported <index>s)[,(list of supported <mode>s)]

### 4.3.2 Description

Set command tells the TA, which input and output format of messages to use. <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 Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Test command returns supported modes as a compound value.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

### 4.3.3 Defined Values

#### **mode**

Integer. Indicates multiple message deletion request as follows:

**Table 4-2:** *mode*

Value	Description
0	PDU mode (default when implemented)
1	text mode

## 4.4 List Messages: +CMGL

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

### 4.4.1 Syntax

Command	Possible Response(s)
AT+CMGL=<stat>	<ul style="list-style-type: none"> <li>if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs: +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;oa/da&gt;, [<i>&lt;alpha&gt;</i>], [<i>&lt;scts&gt;</i>][, [<i>&lt;tooa/toda&gt;</i>, &lt;length&gt;]] &lt;CR&gt;&lt;LF&gt; &lt;data&gt; [ &lt;CR&gt;&lt;LF&gt; +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;da/oa&gt;, [<i>&lt;alpha&gt;</i>], [<i>&lt;scts&gt;</i>][, [<i>&lt;tooa/toda&gt;</i>, &lt;length&gt;] &lt;CR&gt;&lt;LF&gt; &lt;data&gt;[...]]</li> <li>if text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs: +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;fo&gt;, &lt;mr&gt;, [<i>&lt;ra&gt;</i>], [<i>&lt;tora&gt;</i>], &lt;scts&gt;, &lt;dt&gt;, &lt;st&gt; [ &lt;CR&gt;&lt;LF&gt; +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;fo&gt;, &lt;mr&gt;, [<i>&lt;ra&gt;</i>], [<i>&lt;tora&gt;</i>], &lt;scts&gt;, &lt;dt&gt;, &lt;st&gt;[...]]</li> <li>if text mode (+CMGF=1), command successful and SMS-COMMANDs: +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;fo&gt;, &lt;ct&gt; [ &lt;CR&gt;&lt;LF&gt; +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;fo&gt;, &lt;ct&gt;[...]]</li> <li>if text mode (+CMGF=1), command successful and CBM storage: +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;sn&gt;, &lt;mid&gt;, &lt;page&gt;, &lt;pages&gt; &lt;CR&gt;&lt;LF&gt;&lt;data&gt; [ &lt;CR&gt;&lt;LF&gt; +CMGL: &lt;index&gt;, &lt;stat&gt;, &lt;sn&gt;, &lt;mid&gt;, &lt;page&gt;, &lt;pages&gt; &lt;CR&gt;&lt;LF&gt;&lt;data&gt;[...]]</li> <li>otherwise: +CMS ERROR: &lt;err&gt;</li> </ul>
AT+CMGL=?	+CMGL: (list of supported <stat>s)

### 4.4.2 Description

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

**Note:** If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs, SMS-STATUS-REPORTs and SMS-COMMANDs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.

Test command shall give a list of all status values supported by the TA.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

### 4.4.3 Defined Values

**stat**

Integer.

**Table 4-3:** *stat*

Value	Description
0	"REC UNREAD": received unread message (i.e. new message)
1	"REC READ": received read message
2	"STO UNSENT": stored unsent message (only applicable to SMS)
3	"STO SENT": stored sent message (only applicable to SMS)
4	"ALL": all messages (only applicable to +CMGL command)

## 4.5 Read Message: +CMGR

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

### 4.5.1 Syntax

Command	Possible Response(s)
AT+CMGR=<index>	<ul style="list-style-type: none"> <li>if text mode (+CMGF=1), command successful and SMS-DELIVER: +CMGR: &lt;stat&gt;,&lt;oa&gt;,[&lt;alpha&gt;],[&lt;scts&gt;],[&lt;tooa&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcs&gt;,&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt;]&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</li> <li>if text mode (+CMGF=1), command successful and SMS-SUBMIT: +CMGR: &lt;stat&gt;,&lt;da&gt;,[&lt;alpha&gt;],[&lt;toda&gt;,&lt;fo&gt;,&lt;pid&gt;,&lt;dcs&gt;],[&lt;vp&gt;],[&lt;sca&gt;,&lt;tosca&gt;,&lt;length&gt;]&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</li> <li>if text mode (+CMGF=1), command successful and SMS-STATUS-REPORT: +CMGR: &lt;stat&gt;,&lt;fo&gt;,&lt;mr&gt;,[&lt;ra&gt;],[&lt;tora&gt;],[&lt;scts&gt;,&lt;dt&gt;,&lt;st&gt;</li> <li>if text mode (+CMGF=1), command successful and SMS-COMMAND: +CMGR: &lt;stat&gt;,&lt;fo&gt;,&lt;ct&gt;[,&lt;pid&gt;],[&lt;mn&gt;],[&lt;da&gt;],[&lt;toda&gt;],[&lt;length&gt;]&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</li> <li>if text mode (+CMGF=1), command successful and CBM storage: +CMGR: &lt;stat&gt;,&lt;sn&gt;,&lt;mid&gt;,&lt;dcs&gt;,&lt;page&gt;,&lt;pages&gt;&lt;CR&gt;&lt;LF&gt;&lt;data&gt;</li> <li>otherwise: +CMS ERROR: &lt;err&gt;</li> </ul>
AT+CMGR=?	

### 4.5.2 Description

Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

## 4.5.3 Defined Values

**index**  
Integer.

## 4.6 Send Message: +CMGS

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.6.1 Syntax

Command	Possible Response(s)
if text mode (+CMGF=1): <b>AT+CMGS=&lt;da&gt;[,&lt;to&gt;]&lt;C R&gt;text is entered&lt;ctrl-Z/ESC&gt;</b>	<ul style="list-style-type: none"> <li>if text mode (+CMGF=1) and sending successful: +CMGS : &lt;mr&gt;[,&lt;scts&gt;]</li> <li>If sending fails:+CMS ERROR:&lt;err&gt;</li> </ul>
<b>AT+CMGS=?</b>	

### 4.6.2 Description

Execution command sends message from a 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 sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

- entered text (3GPP TS 23.040 [3] TP-Data-Unit) is sent to address <da> and all current settings (refer Set Text Mode Parameters +CSMP and Service Centre Address +CSCA) are used to construct the actual PDU in ME/TA.
- the TA shall send a four character sequence <CR><LF><greater\_than><space> (IRA 13, 10, 62, 32) after command line is terminated with <CR>; after that text can be entered from TE to ME/TA.
- the DCD signal shall be in ON state while text is entered.
- the echoing of entered characters back from the TA is controlled by V.25ter echo command E.
- the entered text should be formatted as follows:
  - if <dc> (set with +CSMP) indicates that 3GPP TS 23.038 [2] GSM 7 bit default alphabet is used and <fo> indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is not set:

- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007 [9]): ME/TA converts the entered text into the GSM 7 bit default alphabet according to rules of Annex A; back-space can be used to delete last character and carriage returns can be used (previously mentioned four character sequence shall be sent to the TE after every carriage return entered by the user);
- -if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into the GSM 7 bit default alphabet characters. (e.g. 17 (IRA 49 and 55) will be converted to character (GSM 7 bit default alphabet 23)).
- if <dc> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that 3GPP TS 23.040 [3] TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42).
- sending can be cancelled by giving <ESC> character (IRA 27).
- <ctrl-Z> (IRA 26) must be used to indicate the ending of the message body.



## 4.7 Write Message to Memory: +CMGW

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.7.1 Syntax

Command	Possible Response(s)
If text mode (+CMGF=1) <b>AT+CMGW</b> =[<oa/da>[,<tooa/ toda>[,<stat>]]]<CR> <b>text is entered</b> <ctrl-Z/ESC>	+CMGW : <index> +CMS ERROR : <err>
<b>AT+CMGW=?</b>	

### 4.7.2 Description

Execution command stores message (either SMS-DELIVER or SMS-SUBMIT) 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> allows also other status values to be given. The entering of text is done similarly as specified in command [Send Message: +CMGS](#). If writing fails, final result code +CMS ERROR: <err> is returned.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

---

**Note:** SMS-COMMANDS and SMS-STATUS-REPORTS can not be stored in text mode.

---

## 4.7.3 Defined Values

### **mode**

Integer. Indicates multiple message deletion request as follows:

**Table 4-4:** *mode*

Value	Description
0	PDU mode (default when implemented)
1	text mode

## 4.8 More Messages to Send: +CMMS

---

**Note:** This command is described in *3GPP TS 27.005*. See Section *References*.

---

### 4.8.1 Syntax

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

### 4.8.2 Description

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

Test command returns supported values as a compound value.

## 4.8.3 Defined Values

**n**  
 Integer.

**Table 4-5:** *n*

Value	Description
0	Disable
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> automatically back to 0
2	enable (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 shall not switch automatically back to <n>=0)

## 4.9 Message Service Failure Result Code: +CMS ERROR

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

### 4.9.1 Syntax

Command	Possible Response(s)
	+CMS ERROR: <err>

### 4.9.2 Description

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. ERROR is returned normally when error is related to syntax or invalid parameters.

### 4.9.3 Defined Values

**err**

Integer. The values used by common messaging commands are as follows:

**Table 4-6:** *err*

Value	Description
0...127	3GPP TS 24.011 [6] clause E.2 values
128...255	3GPP TS 23.040 [3] clause 9.2.3.22 values.
300	ME failure
301	SMS service of ME reserved
302	operation not allowed

**Table 4-6: *err*** (Continued)

Value	Description
303	operation not supported
304	invalid PDU mode parameter
305	invalid text mode parameter
310	(U)SIM not inserted
311	(U)SIM PIN required
312	PH-(U)SIM PIN required
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required
318	(U)SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
500	unknown error
...511	other values in range 256...511 are reserved
512	manufacturer specific

## 4.10 Send Message from Storage: +CMSS

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

### 4.10.1 Syntax

Command	Possible Response(s)
AT+CMSS=<index>[,<da>[,< toda>]]	<ul style="list-style-type: none"><li>if text mode (+CMGF=1) and sending successful: +CMSS: &lt;mr&gt;[,&lt;scts&gt;]</li><li>If sending fails:+CMS ERROR:&lt;err&gt;</li></ul>
AT+CMSS=?	

### 4.10.2 Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. 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 sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

### 4.10.3 Defined Values

**index**

Integer.

## 4.11 Unsolicited Result Code +CMTI

---

**Note:** This command is described in *3GPP TS 27.005*. See Section *References*.

---

### 4.11.1 Syntax

Command	Possible Response(s)
	+CMTI : <mem>, <index>



## 4.12 New Message Acknowledgement to ME/TA: +CNMA

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.  
See the current implementation limitation in command description.

---

### 4.12.1 Syntax

Command	Possible Response(s)
if PDU mode (+CMGF=0): AT+CNMA[=<n>[,<length><CR>PDU is given<ctrl-Z/ESC>	+CMS ERROR:<err>
AT+CNMA=?	if PDU mode (+CMGF=0): +CNMA:(list of supported <n>s)

### 4.12.2 Description

---

**Caution:** Only parameter <n> is currently supported in PDU mode.

---

Execution command confirms reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI tables 2 and 4). This acknowledgement command shall be used when +CSMS parameter <service> equals 1. In PDU mode, it is possible to send either positive (RP-ACK) or negative (RP-ERROR) acknowledgement to the network. Parameter <n> defines which one will be sent. Optionally (when <length> is greater than zero) an acknowledgement TPDU (SMS-DELIVER-REPORT for RP-ACK or RP-ERROR) may be sent to the network. The entering of PDU is done similarly as specified in command Send Message +CMGS, except that the format of <ackpdu> is used instead of <pdu> (i.e. SMSC address field is not present). PDU shall not be bounded by double quotes. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should respond as specified in 3GPP TS 24.011 [6] to the network. ME/TA

shall automatically disable routing to TE by setting both <mt> and <ds> values of +CNMI to zero.

If command is executed, but no acknowledgement is expected, or some other ME related error occurs, final result code +CMS ERROR: <err> is returned.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

## 4.13 New Message Indications to TE: +CNMI

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.  
See the current implementation limitation in mode and mt parameters description.

---

### 4.13.1 Syntax

Command	Possible Response(s)
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	+CMS ERROR:<err>
AT+CNMI?	+CNMI:<mode>,<mt>,<bm>,<ds>,<bfr>
AT+CNMI=?	+CNMI:(list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)

### 4.13.2 Description

Set command selects the procedure, how receiving of new messages from the network is 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 [2].

---

**Note:** When DTR signal is not available or the state of the signal is ignored (V.25ter command &D0), reliable message transfer can be assured by using +CNMA acknowledgement procedure.

---

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

Test command gives the settings supported by the TA as compound values.

---

**Note:** Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMs and CBMs, and to define whether a message routed directly to TE should be acknowledged or not (refer command +CNMA).

---

### 4.13.3 Defined Values

---

**Caution:** Only the following parameters are supported:

- <mode>: '0' or '1' or '2'
- <mt>: '0' or '1' or '2' or '3'
- <bm>: '0' (broadcast is not supported)
- <ds>: '0' or '1' or '2'
- <bfr>: '0' or '1'

---

**Caution:** The following parameters are NOT supported:

- <mode>: '3'
  - <bm>: '1' (broadcast is not supported)
- 

#### mode

Integer. The buffering mechanism may as well be located in the ME; the setting affects only to unsolicited result codes specified within this command):

**Table 4-7:** *mode*

Value	Description
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.

**Table 4-7: mode** (Continued)

Value	Description
3	Forward unsolicited result codes directly to the TE. TA-TE link specific inband technique used to embed result codes and data when TA is in on-line data mode.

---

**Note:** It is possible that ME/TA result code buffer is in volatile memory. In this case messages may get lost if the power of ME/TA is switched off before codes are sent to TE. Thus, it is not recommended to use direct message routing (<mt>=2 or 3, <bm>=2 or 3, or <ds>=1) with <mode> value 0 or 2.

---

**mt**

Integer. The rules for storing received SMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), preferred memory storage (+CPMS) setting and this value;

---

**Note:** If AT command interface is acting as the only display device, the ME must support storing of class 0 messages and messages in the message waiting indication group (discard message);

---

**Table 4-8: mt**

Value	Description
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 using unsolicited result code: +CMTI : <mem>,<index>
2	SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code: +CMT : [ <i>&lt;alpha&gt;</i> ],<length><CR><LF><pdu> (PDU mode enabled); or+CMT : <oa>, [ <i>&lt;alpha&gt;</i> ],<scts>[,<toa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled; about parameters in italics, refer command Show Text Mode Parameters +CSDH) If ME has its own display device then class 0 messages and messages in the message waiting indication group (discard message) may be copied to both ME display and to TE. In this case, ME shall send the acknowledgement to the network (refer table 2). Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1.
3	Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.

**bm**

Integer. The rules for storing received CBMs depend on its data coding scheme (refer 3GPP TS 23.038 [2]), the setting of Select CBM Types (+CSCB) and this value;

**Table 4-9: bm**

Value	Description
0	No CBM indications are routed to the TE.
1	If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem>, <index>
2	New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled) or +CBM: <sn>, <mid>, <dc>, <page>, <pages><CR><LF><data> (text mode enabled) If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. (U)SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).
3	CBMs are routed directly to TE using unsolicited result codes defined in <bm>=2. If CBM storage is supported, messages of other classes result in indication as defined in <bm>=1.

**ds**

Integer.

**Table 4-10: ds**

Value	Description
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 enabled) or +CDS: <fo>, <mr>, [<ra>], [<tora>], <scts>, <dt>, <st> (text mode enabled)
2	If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDSI: <mem>, <index>

**bfr**  
Integer.

**Table 4-11:** *bfr*

Value	Description
0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 is entered (OK response shall be given before flushing the codes).
1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1...3 is entered.

## 4.14 Preferred Message Storage: +CPMS

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

### 4.14.1 Syntax

Command	Possible Response(s)
AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	+CPMS : <used1>,<total1>,<used2>,<total2>,<used3>,<total3> +CMS ERROR : <err>
AT+CPMS?	+CPMS : <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3> > +CMS ERROR : <err>
AT+CPMS=?	+CPMS : (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)

### 4.14.2 Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR : <err> shall be returned.

Test command returns lists of memory storages supported by the TA.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.



## 4.15 Restore Settings: +CRES

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.  
See the current implementation limitation in the parameters description.

---

### 4.15.1 Syntax

Command	Possible Response(s)
AT+CRES[=<profile>]	+CMS ERROR: <err>
AT+CRES=?	+CRES: (list of supported <profile>s)

### 4.15.2 Description

Execution command restores message service settings from non-volatile memory to active memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are restored. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be restored.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

### 4.15.3 Defined Values

**profile**

Integer. Value in range 0...255. Manufacturer specific profile number from where settings are to be restored.

## 4.16 Save Settings: +CSAS

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.  
See the current implementation limitation in the parameters description.

---

### 4.16.1 Syntax

Command	Possible Response(s)
AT+CSAS[=<profile>]	+CMS ERROR: <err>
AT+CSAS=?	+CSAS : (list of supported <profile>s)

### 4.16.2 Description

Execution command saves active message service settings to a non-volatile memory. A TA can contain several profiles of settings. Settings specified in commands Service Centre Address +CSCA, Set Message Parameters +CSMP and Select Cell Broadcast Message Types +CSCB (if implemented) are saved. Certain settings may not be supported by the storage (e.g. (U)SIM SMS parameters) and therefore can not be saved.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

Test command shall display the supported profile numbers for reading and writing of settings.

### 4.16.3 Defined Values

**profile**

Integer. Value in range 0...255. Manufacturer specific profile number where settings are to be stored.

## 4.17 Service Centre Address: +CSCA

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.17.1 Syntax

Command	Possible Response(s)
AT+CSCA=<sca>[, <tosca>]	
AT+CSCA?	+CSCA : <sca>,<tosca>
AT+CSCA=?	

### 4.17.2 Description

Set command updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

## 4.18 Show Text Mode Parameters: +CSDH

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.18.1 Syntax

Command	Possible Response(s)
AT+CSDH[=<show>]	
AT+CSDH?	+CSDH : <show>
AT+CSDH=?	+CSDH : (list of supported <show>s)

### 4.18.2 Description

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

Test command returns supported values as a compound value.

### 4.18.3 Defined Values

**show**  
Integer.

**Table 4-12:** *show*

Value	Description
0	do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <toa> in +CMT, +CMGL, +CMGR result codes for SMSDELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>.
1	show the values in result codes

## 4.19 Set Text Mode Parameters: +CSMP

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.

---

### 4.19.1 Syntax

Command	Possible Response(s)
AT+CSMP=[<fo>[,<vp>[,<pid>[,<dc>]]]]	
AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dc>
AT+CSMP=?	

### 4.19.2 Description

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>. If TA supports the EVPF, see 3GPP TS 23.040 [3], it shall be given as a hexadecimal coded string (refer e.g. < pdu>) with double quotes.

---

**Note:** When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW), <vp> field can be used for < sct s>.

---

## 4.20 Select Message Service: +CSMS

---

**Note:** This command is described in 3GPP TS 27.005. See Section *References*.  
See the current implementation limitation in the parameters description.

---

### 4.20.1 Syntax

Command	Possible Response(s)
AT+CSMS=<service>	+CSMS : <mt>,<mo>,<bm> +CMS ERROR : <err>
AT+CSMS?	+CSMS : <service>,<mt>,<mo>,<bm>
AT+CSMS=?	+CSMS : (list of supported <service>s)

### 4.20.2 Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR : <err> shall be returned.

See also [4.9 Message Service Failure Result Code: +CMS ERROR](#) on page 157 for <err> values.

Also read command returns supported message types along the current service setting.

Test command returns a list of all services supported by the TA.

## 4.20.3 Defined Values

---

**Caution:** Restriction: cannot disable <mt>, <mo> and <bm> services.

---

**service**  
Integer.

**Table 4-13:** *service*

Value	Description
0	3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]
1	3GPP TS 23.040 [3] and 3GPP TS 23.041 [4]the requirement of <service> setting 1 is mentioned under corresponding command descriptions)
2...127	reserved
128	manufacturer specific

**mt, mo, bm**  
Integer.

**Table 4-14:** *mt, mo, bm*

Value	Description
0	type not supported
1	type supported

# 5

## Configuration Related Commands

### 5.1 View Configuration Profiles: &V

#### 5.1.1 Syntax

Command	Possible Response(s)
AT&V	<CR><LF>(list of stored setting)<CR><LF><CR><LF>OK<CR><LF>

#### 5.1.2 Description

This command reads the current settings of the system for various parameters set by AT commands and stored by [Write Active Profile in Memory: &W](#).

#### 5.1.3 Example

```
AT&V
E: 0; V: 1; Q: 0; &C: 1; &D: 2; &S: 0;
S3 : 013; S4 : 010; +IFC : 2,2; +ICF: 3; +IPR : 921600;
OK

AT+CFUN?
+CFUN: 0
OK
```



## 5.2 Write Active Profile in Memory: &W

### 5.2.1 Syntax

Command	Possible Response(s)
AT&W<profile>	OK

### 5.2.2 Description

AT&W stores the current AT command settings to a user defined profile in non-volatile memory. The settings corresponding to the following commands are stored:

- ATE
- ATV
- ATQ
- AT&C
- AT&D
- AT&S
- ATS3
- ATS4
- AT+HFC
- AT+ICF
- AT+IPR

See also command [View Configuration Profiles: &V](#).

## 5.3 Hardware Function Configuration: +SQNHWCFG

### 5.3.1 Syntax

Command	Possible Response(s)
AT+SQNHWCFG=<function>[,<enable>[,<polarity>]]	OK
AT+SQNHWCFG="ps_status"[,<enable>]	OK
AT+SQNHWCFG="wake0"[,<enable>[,<polarity>]]	OK
AT+SQNHWCFG="wake1"[,<enable>[,<polarity>]]	OK
AT+SQNHWCFG="wakeRTS0"[,<enable>[,<polarity>]]	OK
AT+SQNHWCFG="wakeRTS1"[,<enable>[,<polarity>]]	OK
AT+SQNHWCFG?	+SQNHWCFG: "ps_status"[,<enable>] +SQNHWCFG: "wake0"[,<enable>[,<polarity>]] +SQNHWCFG: "wake1"[,<enable>[,<polarity>]] +SQNHWCFG: "wakeRTS0"[,<enable>[,<polarity>]] +SQNHWCFG: "wakeRTS1"[,<enable>[,<polarity>]]  +SQNHWCFG: "status_led",1 +SQNHWCFG: "ring0",1, 0 +SQNHWCFG: "dcd0",1 +SQNHWCFG: "dsr0",1 +SQNHWCFG: "dtr0",1 +SQNHWCFG: "rtscts0",1 +SQNHWCFG: "rtscts1",1 +SQNHWCFG: "rtscts2",0
AT+SQNHWCFG=?	OK

## 5.3.2 Description

Write command configure primary/alternate module pin functions described in the module's datasheet.

Write command issued with `<function>` parameter only is equivalent to read command output filtered out for selected `<function>`.

Read command returns the list of supported pin functions state (1 function per line). For each function, it includes the state and detailed configuration whenever applicable. Displayed information corresponds to the configuration applicable at next reboot. The currently active configuration will be overridden by the changes if any.

Notes:

1. Configuration change will be applied at next module reboot.
2. Configuration is non volatile, persistent at device reboot and software upgrade.
3. In case of unsupported function or invalid configuration, AT command will exit in ERROR and "+CME ERROR: <err>" notification will be raised.
4. For pins shared by several functions (such as RING0 shared with GPIO25), one should disable current activated function before enabling a new function. Trying to enable a function using a pin already assigned to another function will exit in ERROR and "+CME ERROR: <err>" notification will be raised.
5. Pins with unassigned function are deactivated, and configured in state at reset as defined in the chipset datasheet. Please refer to the datasheet for details.

Some of the following functions can currently be activated on Monarch module pins. More functions will be available with future software releases.

- Module Power Saving status

Write command: `AT+SQNHWCFG="ps_status" [, <enable>]`

Read command output: `+SQNHWCFG: "ps_status", <enable>`

The function is disabled by default (pin configured in input mode), and shared with GPIO24.

A high level indicates that module is in active mode. A low level indicates that module is in low power modes (PS-P or PS-PM suspend) to minimize power consumption. This signal can be used to inform a host that the module needs to be woke-up with either RTS0, WAKE0 or WAKE1 signal before sending data or commands through one of the UART interface.

- Wake{0, 1, RTS0, RTS1} input

Write command:

AT+SQNHWCFG="wakeX" [, <enable> [, <polarity>]]

Read command output: +SQNHWCFG:

"wakeX", <enable>, <polarity>

Configurable wake interfaces: wake0, wake1, wakeRT0, wakeRTS1

WAKE inputs are detected on level (configurable using through <polarity> parameter) that must last at least 100 µs.

All WAKE inputs are disabled by default (pin configured in input, High impedance).

AT command usage and syntax depends on the function to activate/deactivate.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

### 5.3.3 Defined Values

#### function

String. Function name.

**Table 5-1:** *function*

Value	Description
"ps_status"	Module Power Saving status.
"wake0", "wake1", "wakeRTS0", "wakeRTS1"	Wake{0,1, RTS0, RTS1} input

#### enabled

Integer in range [0-1]. Function enable state.

**Table 5-2:** *enabled*

Value	Description
0	Function is enabled.
1	Function is disabled.

### polarity

Integer in range [0-1]. Function signal lines polarity.

**Table 5-3:** *polarity*

Value	Description
0	negative polarity: signal is active low level
1	positive polarity: signal is active high level

## 5.3.4 Example

Example (default configuration):

```
AT+SQNHWCFG?  
+SQNHWCFG: "status_led",0  
+SQNHWCFG: "ring0",1,0  
+SQNHWCFG: "ps_status",0  
+SQNHWCFG: "wake0",0,1  
+SQNHWCFG: "wake1",0,1  
OK
```

The following error codes may be returned through +CME ERROR. They are also listed in

**Table 5-4:** +SQNHWCFG Specific Error Codes

Code	Description
540	HW configuration failed: General error
541	HW configuration failed: Invalid function
542	HW configuration failed: Invalid function parameter
543	HW configuration failed: pin(s) already assigned to another function

# 6

## SMS Proprietary Commands

### 6.1 Stored SMS Statistics: +SQNSMSCOUNT

#### 6.1.1 Syntax

Command	Possible Response(s)
AT+SQNSMSCOUNT=[=<mem>[,<stat>]]	+SQNSMSCOUNT : <count>,<mem>,<stat> OK
AT+SQNSMSCOUNT=?	+SQNSMSCOUNT : (list of possible <mem>s),(list of possible <stat>s) OK

#### 6.1.2 Description

Execution command returns the number of SMS of status <stat> stored in given <mem>.

If <mem> is omitted, then current mem1 is used. If <stat> is omitted, then results is returned for all possible <stat>.

The command has no impact on the status of messages (UNREAD or READ).

## 6.1.3 Defined Values

### **mem**

String type. Memory from which the messages are read.

**Table 6-1:** *mem*

Value	Description
"ME"	ME message storage
"SM"	(U)SIM message storage
"SR"	Status report storage

### **stat**

String type, indicates the status of message in memory

**Table 6-2:** *stat*

Value	Description
"REC UNREAD"	received unread message
"REC READ"	received read message
"STO UNSENT"	stored unsent message
"STO SENT"	stored sent message
"ALL"	all messages

### **count**

Integer type. Number of SMS in storage <mem> with status <stat>.

## 6.1.4 Example

- ```
AT+SQNSMSCOUNT="ME", "REC READ"  
+SQNSMSCOUNT: 1,ME,REC READ  
OK
```
- ```
AT+SQNSMSCOUNT  
+SQNSMSCOUNT: 0,ME,REC UNREAD  
+SQNSMSCOUNT: 1,ME,REC READ  
+SQNSMSCOUNT: 0,ME,STO UNSENT  
+SQNSMSCOUNT: 1,ME,STO SENT  
+SQNSMSCOUNT: 2,ME,ALL  
OK
```



## 6.2 Delete Long SMS: +SQNSMSDELETE

### 6.2.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSMSDELETE=&lt;index&gt;</code>	

### 6.2.2 Description

This command deletes the message *<index>* from the message storage *<mem1>*. If the message is segmented, all its segments are deleted.

### 6.2.3 Example

The first command deletes the SMS of index 0. The second command on the same index returns an error.

```
AT+SQNSMSDELETE=1  
OK
```

```
AT+SQNSMSDELETE=1  
+CMS ERROR: 321
```

## 6.3 Get List of Indexes of Received SMS: +SQNSMSLIST

### 6.3.1 Syntax

Command	Possible Response(s)
AT+SQNSMSLIST	+SQNSMSLIST: <index> [,<index>[, ... ] ] +CMS ERROR: <err>

### 6.3.2 Description

This command returns the indexes of all stored messages. For segmented messages, it returns only one index (of one of its segment).

### 6.3.3 Example

In the following example, 7 SMS fragments (#0 to #6) are in memory, and the last 3 belong to the same SMS (fragments #4, #5 and #6).

```
AT+SQNSMSLIST
+SQNSMSLIST: 0,1,2,3,4
OK
```

## 6.4 Send Multiline SMS: +SQNSMSMLESEND

### 6.4.1 Syntax

Command	Possible Response(s)
AT+SQNSMSMLESEND=<to>[,<save> [,<priority> [,<cbkNumber>]]]<CR>Text is entered <CTRL+Z/ESC>	+SQNSMSMLESEND:ID,<internalId> [+SQNSMSMLESEND:STORED,<mem>,<storageId>]
AT+SQNSMSMLESEND=?	+SQNSMSMLESEND:<to>[,<save> [,<priority> [,<cbkNumber>]]]<CR>Text is entered <CTRL+Z/ESC>

### 6.4.2 Description

Execution command (optionally stores, and) sends message from a TE to the network.

Message reference value <mr> is returned to the TE via URC on successful message delivery. Command behaves as AT+SQNSMSSEND except that text is entered at separate lines after prompt <CR><LF><greater\_than><space> (IRA 13, 10, 62, 32).

Final result OK or ERROR is returned immediately, not waiting for Network response.

Command has auto-segmentation feature. If necessary, the entered text is split to chunks and sent in several concatenated SMS.

The sending can be cancelled by entering <ESC> character (IRA 27). The <ctrl-z> (IRA 26) must be used to indicate the ending of the message body.

## 6.4.3 Defined Values

**to**  
 String type, destination address.

**save**  
 Integer type

**Table 6-3:** *save*

Value	Description
0	don't store SMS before sending.
1	store SMS before sending.

**priority**  
 Integer type, 3GPP2 only

---

**Note:** This parameter is ignored in the current implementation.

---

**Table 6-4:** *priority*

Value	Description
0	NORMAL
1	INTERACTIVE
2	URGENT
3	EMERGENCY

**cbkNumber**  
 String type, 3GPP2 only, number to call back.

---

**Note:** This parameter is ignored in the current implementation.

---

**internalId**  
 Integer type, internal identifier used to bind intermediate response with subsequent URC.

## 6.4.4 Defined URCs

For each SMS segment, two URC are notified.

The first URC is the status of sending attempt and the second is the status of network response.

```
+SQNSMSSENDRES: SENT OK | SENT  
ERROR,<internalId>,<mr>|<errorCause>
```

```
+SQNSMSSENDRES: ACK OK | ACK  
ERROR,<internalId>[,<errorCause>]
```

with

- <mr>: integer type, TPDU message reference.
- <errorCause>: integer type, error cause

## 6.4.5 Example

- Send message:

```
AT+SQNSMSMLSEND="+11325476980"  
> This the first line.  
> This is the last line.  
+SQNSMSMLSEND: ID,4  
OK  
+SQNSMSMLSEND: SENT OK,4,44  
+SQNSMSMLSEND: ACK OK,4
```

- Store and send message:

```
AT+SQNSMSMLSEND="+11325476980",1  
> test quotes "abc"  
+SQNSMSMLSEND: STORED,ME,1  
+SQNSMSMLSEND: 14  
OK  
+SQNSMSMLSEND: SENT OK,14,49  
+SQNSMSMLSEND: ACK OK,14
```

## 6.5 Read Long SMS: +SQNSMSREAD

### 6.5.1 Syntax

Command	Possible Response(s)
AT+SQNSMSREAD=<index>	+SQNSMSREAD: <stat>, <send-status>, <oa>, <scts>, <local-ts>, <priority>, <cbk-xnumber><CR><LF><text>

### 6.5.2 Description

This command reads the message <index> from the message storage location. If the message is segmented, then it performs an automatic reconstruction of the full message from available segments in the storage.

### 6.5.3 Defined Values

#### stat

Same usage as +CMGR.

#### send\_status

String.

---

**Note:** Only value "UNUSED" is currently supported.

---

#### scts

Integer. Service center time stamp.

#### local\_ts

String.

---

**Note:** Only value "00/00/00,00:00:00+00" is currently supported.

---

#### oa

String. Originating address.

**priority**

Integer. Message priority.

---

**Note:** Only value '0' is currently supported.

---

**cbk\_number**

String.

---

**Note:** Only value "" is currently supported.

---

## 6.5.4 Example

```
AT+SQNSMSREAD=2
+SQNSMSREAD: "REC READ","SEND
UNSET","5714550728","12/12/04,03:48:20+00","00/00/00,00:00:00+00",0,""
Test msg to check Priority and Call-Back
OK
```

## 6.6 Send SMS: +SQNSMSEN

### 6.6.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSMSEN=&lt;to&gt;,&lt;text&gt;[, &lt;save&gt;[, &lt;priority&gt;[, &lt;cbk number&gt;]]]</code>	<code>+SQNSMSEN: ID,&lt;internalId&gt;</code> <code>[&lt;CR&gt;&lt;LF&gt;+SQNSMSEN: STORED ,&lt;mem&gt;,&lt;storageId&gt;]</code> <code>OK</code>

**Note:** Quotes are not supported.

### 6.6.2 Description

Execution command (optionally stores, and) sends message from a TE to the network.

Message reference value <mr> is returned to the TE via +SQNSMSENRES URC on successful message delivery.

Final result OK or ERROR return immediately not waiting for Network response.

Command has auto-segmentation feature - if necessary, entered text is split to chunks and sent in several concatenated SMS.



## 6.6.3 Defined Values

**to**

String. Destination number for the SMS message.

**text**

String. Text of the SMS message.

**save**

Integer. Optional parameter.

**Table 6-5:** *save*

Value	Description
0	(default value) Do not save the SMS message.
1	Save the SMS message.

**priority**

Integer.

---

**Note:** This parameter is ignored in the current implementation.

---

**Table 6-6:** *priority*

Value	Description
0	Normal
1	Interactive
2	Urgent
3	Emergency

**cbk number**

String. Callback number.

---

**Note:** This parameter is ignored in the current implementation.

---

**internalId**

Integer. Internal identifier used to bind the intermediate response with the subsequent URC.

---

**Note:** This parameter is ignored in the current implementation.

---



# 7

## ITU AT Channel Configuration Commands

### 7.1 Received Line Signal Detector Behaviour: &C

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

#### 7.1.1 Syntax

Command	Possible Response(s)
AT&C[<value>]	

#### 7.1.2 Description

This command defines the Circuit 109 (Received line signal detector) behavior.

This parameter determines how the state of circuit 109 relates to the detection of received line signal from the distant end. Changing the parameter will take effect immediately in both the command and online command states.

In &C1 mode of operation, circuit 109 is not turned off until all data previously received from the remote DCE is delivered to the local DTE. However, such buffered data shall be discarded and circuit 109 turned off if the DTE turns off circuit 108 (if &D1 or &D2 is set).

## 7.1.3 Defined Values

**value**

Integer.

---

**Note:** The recommended default value is 1.

---

**Table 7-1:** value

Value	Description
0	The DCE always presents the ON condition on circuit 109.
1	Circuit 109 changes in accordance with the underlying DCE, which may include functions? other than the physical layer functions (e.g., ITU-T Recs V.42, V.110, V.120 and V.13).

## 7.2 Echo: E

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.2.1 Syntax

Command	Possible Response(s)
ATE<value>	

### 7.2.2 Description

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command state.

### 7.2.3 Defined Values

**value**

Integer.

---

**Note:** The default value is 0, i.e. DCE does not echo characters.

---

**Table 7-2:** value

Value	Description
0	DCE does not echo characters during command state and online command state.
1	DCE echoes characters during command state and online command state.

## 7.3 Set to Factory-Defined Configuration: &F

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.3.1 Syntax

Command	Possible Response(s)
AT&F[<value>]	OK if value is valid. ERROR if value is not recognized or supported.

### 7.3.2 Description

This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria.

An OK result code for this command is issued using the same rate, parity, and word format as the DTE command line containing the command, but using the factory-defined values for other parameters that affect the format of result codes (e.g., Q, V, S3, S4) and dependent upon other commands that may follow on the same command line.

Execution time for this action varies widely depending on manufacturer implementation. The DTE should not assume the amount of time required to execute this command, but await a result code or other positive indication from the DCE that it is ready to accept a command.

## 7.3.3 Defined Values

**value**  
Integer.

**Table 7-3:** *value*

Value	Description
0	Set parameters to factory defaults.
Other	Reserved for manufacturer proprietary use.

## 7.4 Request Product Serial Number Identification: +GSN

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*. See also +CGSN command.

---

### 7.4.1 Syntax

Command	Possible Response(s)
AT+GSN	OK

### 7.4.2 Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the individual device. Typically, the text will consist of a single line containing a manufacturer determined alpha-numeric string, but manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence "0 <CR>" (3/0, 0/13) or "OK<CR>" (4/15, 4/11, 0/13), so that DTE can avoid false detection of the end of this information text.



## 7.5 Request Identification Information: I

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.5.1 Syntax

Command	Possible Response(s)
ATI[<value>]	
ATI or ATI0	<manufacturer><CR><LF><model><CR><LF><ue_version>
ATI1	<ue_version><CR><LF><lr_version>

### 7.5.2 Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, followed by a final result code. <value> may optionally be used to select from among multiple types of identifying information, specified by the manufacturer.

---

**Note:** The responses to this command may not be reliably used to determine the DCE manufacturer, revision level, feature set, or other information, and should not be relied upon for software operation. In particular, expecting a specific numeric response to an I0 command to indicate which other features and commands are implemented in a DCE dooms software to certain failure, since there are widespread differences in manufacturer implementation among devices that may, coincidentally, respond with identical values to this command. Software implementors should use I commands with extreme caution, since the amount of data returned by particular implementations may vary widely from a few bytes to several thousand bytes or more, and should be prepared to encounter ERROR responses if the value is not recognized.

---

ATI or ATI0 write commands reports device MT manufacturer, MT model and the UE software version.

ATI1 write commands reports the UE and LR software versions.

## 7.5.3 Example

```
ATI  
Sequans  
VZ120Q  
UE4.3.0.0-21466  
OK
```

```
ATI1  
UE4.3.0.0-21466  
LR4.3.1.1-ER1-22900  
OK
```

## 7.6 DTE-DCE Character Framing: +ICF

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.6.1 Syntax

Command	Possible Response(s)
AT+ICF=[<format>[,<parity>]]	
AT+ICF?	+ICF:<format>,<parity>
AT+ICF=?	+ICF:(list of supported <format> values),(list of supported <parity> values)

### 7.6.2 Description

This extended-format compound parameter is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use while accepting DTE commands and while transmitting information text and result code, if this is not automatically determined; +IPR=0 forces +ICF=0 (see [Fixed DTE Rate: +IPR](#)). Note that the definition of fixed character format for online data state is for further study.

## 7.6.3 Defined Values

### **format**

Integer. Determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame. Recommended default value is 3.

---

**Note:** The semantics of this command are derived from ITU-T Rec. V.58.

---

**Table 7-4:** *format*

Value	Description
0	autodetect
1	8 Data ; 2 Stop
2	8 Data ; 1 Parity ; 1 Stop
3	8 Data ; 1 Stop
4	7 Data ; 2 Stop
5	7 Data ; 1 Parity ; 1 Stop
6	7 Data ; 1 Stop

### **parity**

Integer. Determines how the parity bit is generated and checked, if present. Recommended default value is 3.

**Table 7-5:** *parity*

Value	Description
0	Odd
1	Even
2	Mark
3	Space

## 7.6.4 Examples

- Read syntax  
+ICF?  
+ICF: 3, 3 for the recommended defaults.
- Test syntax  
+ICF=?  
+ICF: (0-6), (0-3) for all defined values.

## 7.7 DTE-DCE Local Flow Control: +IFC

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

### 7.7.1 Syntax

Command	Possible Response(s)
<b>AT+IFC</b> =[<DCE_by_DTE[,<DTE_by_DCE>]]	
<b>AT+IFC?</b>	+IFC:<DCE_by_DTE>,<DTE_by_DCE>
<b>AT+IFC=?</b>	+IFC:(list of supported <DCE_by_DTE> values),(list of supported <DTE_by_DCE> values)

### 7.7.2 Description

This extended-format compound parameter is used to control the operation of local flow control between the DTE and DCE during the data state when V.42 error control is being used, or when fallback to non-error control mode is specified to include buffering and flow control. It accepts two numeric subparameters:

- <DCE\_by\_DTE>, which specifies the method to be used by the DTE to control the flow of received data from the DCE;
- <DTE\_by\_DCE>, which specifies the method to be used by the DCE to control the flow of transmitted data from the DTE.

## 7.7.3 Defined Values

### DCE\_by\_DTE

Integer. Specifies the method to be used by the DTE to control the flow of received data from the DCE. Recommended default value is 2.

---

**Note:** The semantics of this command are derived from ITU-T Rec. V.58.

---

**Table 7-6:** *DCE\_by\_DTE*

Value	Description
0	None
1	DC1/DC3 on circuit 103; do not pass DC1/DC3 characters to the remote DCE
2	Circuit 133 (Ready for Receiving)
3	DC1/DC3 on circuit 103 with DC1/DC3 characters being passed through to the remote DCE in addition to being acted upon for local flow control
4 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use

### DTE\_by\_DCE

Integer. Specifies the method to be used by the DCE to control the flow of transmitted data from the DTE. Recommended default value is 2.

**Table 7-7:** *DTE\_by\_DCE*

Value	Description
0	None
1	DC1/DC3 on circuit 104
2	Circuit 106 (Clear to Send/Ready for Sending)
3 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use

## 7.7.4 Examples

- Read syntax  
+IFC?  
+IFC:2,2 for the recommended defaults.
- Test syntax  
+IFC=?  
+IFC:(0-3),(0-2) for all defined values.



## 7.8 Fixed DTE Rate: +IPR

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.8.1 Syntax

Command	Possible Response(s)
AT+IPR=<rate>	
AT+IPR?	+IPR:<rate>
AT+IPR=?	+IPR:(list of supported autodetectable <rate> values)[,(list of fixed-only <rate> values)]

### 7.8.2 Description

This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s (as required in 4.3). It may be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE. Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line.

The <rate> specified does not apply in online data state if Direct mode of operation is selected.

## 7.8.3 Defined Values

### rate

The value specified shall be the rate in bits per second at which the DTE-DCE interface should operate, e.g., "19 200" or "115 200". The rates supported by a particular DCE are manufacturer-specific; however, the +IPR parameter should permit the setting of any rate supported by the DCE during online operation. Rates which include a non-integral number of bits per second should be truncated to the next lower integer (e.g., 134.5 bit/s should be specified as 134; 45.45 bit/s should be specified as 45). If unspecified or set to 0, automatic detection is selected for the range determined as in 4.3 and the DCE manufacturer, and the character format is also forced to autodetect.

It is recommended that the default for this parameter be the automatic detection setting (0), which facilitates initial DTE-DCE communications.

## 7.8.4 Examples

- Read syntax

+IPR?

The DCE shall transmit a string of information text to the DTE, consisting of +IPR:<rate>.

- +IPR:0 if set for automatic rate detection.
- +IPR:9600 if set to 9600 bit/s.

- Test syntax

+IPR=?

The DCE shall transmit one or two strings of information text to the DTE, consisting of +IPR:(list of supported autodetectable <rate> values)[,(list of fixed-only <rate> values)]

+IPR:(0,300,1200,2400,4800,9600),(19200,38400,57600) if the DCE can autodetect up to 9600 bit/s and can support three additional higher fixed rates.

## 7.9 Result Code Suppression: Q

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.9.1 Syntax

Command	Possible Response(s)
ATQ[<value>]	OK If value is 0. (none) If value is 1 (because result codes are suppressed). ERROR For unsupported values (if previous value was Q0). (none) For unsupported values (if previous value was Q1).

### 7.9.2 Description

The setting of this parameter determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code – header, result text, line terminator, or trailer – is transmitted. Information text transmitted in response to commands is not affected by the setting of this parameter.

### 7.9.3 Defined Values

**value**  
 Integer.

---

**Note:** The recommended default value is 0.

---

**Table 7-8:** value

Value	Description
0	DCE transmits result codes.
1	Result codes are suppressed and not transmitted.

## 7.10 Command Line Termination Character: S3

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

### 7.10.1 Syntax

Command	Possible Response(s)
ATS3=[<value>]	

### 7.10.2 Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter (see the description of the V parameter for usage).

The previous value of S3 is used to determine the command line termination character for entry of the command line containing the S3 setting command. However, the result code issued shall use the value of S3 as set during the processing of the command line. For example, if S3 was previously set to 13 and the command line "ATS3=30" is issued, the command line shall be terminated with a CR character (IA5 0/13), but the result code issued will use the character with the ordinal value 30 (IA5 2/14) in place of the CR.

### 7.10.3 Defined Values

**value**

Integer in range 0..127. Set command line termination character to this value. Mandatory default value is 13 carriage return character (CR, IA5 0/13).

## 7.11 Response Formatting Character: S4

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.11.1 Syntax

Command	Possible Response(s)
ATS4=[<value>]	

### 7.11.2 Description

This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter (see the description of the V parameter for usage).

If the value of S4 is changed in a command line, the result code issued in response to that command line will use the new value of S4.

### 7.11.3 Defined Values

**value**

Integer in range 0..127. Set response formatting character to this value. Recommended default value is 10 line feed character (LF, IA5 0/10).

## 7.12 Command Line Editing Character: S5

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.12.1 Syntax

Command	Possible Response(s)
ATS5=[<value>]	

### 7.12.2 Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE as a request to delete from the command line the immediately preceding character.

### 7.12.3 Defined Values

**value**

Integer in range 0..127. Set command line editing character to this value. Recommended default value is 8 backspace character (BS, IA5 0/8).

## 7.13 DCE Response Format: V

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

### 7.13.1 Syntax

Command	Possible Response(s)
ATV[<value>]	0 If value is 0 (because numeric response text is being used). OK If value is 1. 4 For unsupported values (if previous value was V0). ERROR For unsupported values (if previous value was V1).

### 7.13.2 Description

The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.

Table 7-9 shows the effect of the setting of this parameter on the format of information text and result codes. All references to <cr> mean "the character with the ordinal value specified in parameter S3"; all references to <lf> likewise mean "the character with the ordinal value specified in parameter S4". See Table 7-9.

**Table 7-9:** Effect of V Parameter on Response Formats

	V0	V1
Information Response	<text><cr><lf>	<cr><lf><text><cr><lf>
result Codes	<numeric code><cr>	<cr><lf><verbose code><cr><lf>

## 7.13.3 Defined Values

**value**

Integer.

---

**Note:** The recommended default value is 1.

---

**Table 7-10:** value

Value	Description
0	DCE transmits limited headers and trailers and numeric text.
1	DCE transmits full headers and trailers and verbose response text.



## 7.14 Reset to Default Configuration: Z

---

**Note:** This command is described in *ITU-T V.250*. See Section *References*.

---

### 7.14.1 Syntax

Command	Possible Response(s)
ATZ[<value>]	OK If <value> is recognized. ERROR If <value> is not recognized or supported.

### 7.14.2 Description

This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If the DCE is connected to the line, it is disconnected from the line, terminating any call in progress.

All of the functions of the command shall be completed before the DCE issues the result code. The DTE should not include additional commands on the same command line after the Z command because such commands may be ignored.

---

**Note:** Because this command may take into consideration the settings of switches and non-volatile parameter storage, it does not necessarily return the DCE to a "known state". In particular, the DCE may, as a result of execution of this command, be placed in a state in which it appears to not respond to DTE commands, or respond in a completely different format than was being used prior to execution of the command.

---

# 8

## System Control Related Commands

### 8.1 Clock: +CCLK

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

#### 8.1.1 Syntax

Command	Possible Response(s)
AT+CCLK= <time>	+CME ERROR: <err>
AT+CCLK=?	+CCLK: <time> +CME ERROR: <err>
AT+CCLK=?	

#### 8.1.2 Description

Set command sets the real time clock of the MT. If setting fails in an MT error, +CME ERROR: <err> is returned. See Section [Mobile Termination Error Result Code: +CME ERROR](#).

Read command returns the current setting of the clock.

## 8.1.3 Defined Values

### **time**

String. Format is "yy/MM/dd, hh:mm:ss zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; range -96...+96). E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to "94/05/06,22:10:00+08"

NOTE:If MT does not support time zone information then the three last characters of <time> are not returned by +CCLK?. The format of <time> is specified by use of the +CSDF command.

## 8.2 Extended Signal Quality: +CESQ

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 8.2.1 Syntax

Command	Possible Response(s)
AT+CESQ	+CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> +CME ERROR: <err>
AT+CESQ=?	+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s)

### 8.2.2 Description

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

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Test command returns values supported as compound values.

## 8.2.3 Defined Values

### rxlev

Integer. Received signal strength level (see 3GPP TS 45.008 [20] subclause 8.1.4).

**Table 8-1:** *rxlev*

Value	Description
0	$\text{rsrp} < -110 \text{ dBm}$
1	$-110 \text{ dBm} \leq \text{rsrp} < -109 \text{ dBm}$
2	$-109 \text{ dBm} \leq \text{rsrp} < -108 \text{ dBm}$
...	...
61	$-50 \text{ dBm} \leq \text{rsrp} < -49 \text{ dBm}$
62	$-49 \text{ dBm} \leq \text{rsrp} < -48 \text{ dBm}$
63	$-48 \text{ dBm} \leq \text{rsrp}$
99	not known or not detectable

### ber

Integer. Channel bit error rate (in percent).

**Table 8-2:** *ber*

Value	Description
0 .. 7	as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4
99	not known or not detectable

### rscp

Integer. Received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3).

**Table 8-3:** *rscp*

Value	Description
0	$\text{rscp} < -120 \text{ dBm}$
1	$-120 \text{ dBm} \leq \text{rscp} < -119 \text{ dBm}$

**Table 8-3:** *rsqp* (Continued)

Value	Description
2	$-119 \text{ dBm} \leq \text{rsqp} < -118 \text{ dBm}$
...	...
94	$-27 \text{ dBm} \leq \text{rsqp} < -26 \text{ dBm}$
95	$-26 \text{ dBm} \leq \text{rsqp} < -25 \text{ dBm}$
96	$-25 \text{ dBm} \leq \text{rsqp}$
255	not known or not detectable

**ecno**

Integer. Ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause).

**Table 8-4:** *ecno*

Value	Description
0	$\text{Ec/Io} < -24 \text{ dB}$
1	$-24 \text{ dB} \leq \text{Ec/Io} < -23.5 \text{ dB}$
2	$-23.5 \text{ dB} \leq \text{Ec/Io} < -23 \text{ dB}$
...	...
47	$-1 \text{ dB} \leq \text{Ec/Io} < -0.5 \text{ dB}$
48	$-0.5 \text{ dB} \leq \text{Ec/Io} < 0 \text{ dB}$
49	$0 \text{ dB} \leq \text{Ec/Io}$
255	not known or not detectable

**rsrq**

Integer. Reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7).

**Table 8-5:** *rsrq*

Value	Description
0	$\text{rsrq} < -19.5 \text{ dB}$

**Table 8-5:** *rsrq* (Continued)

Value	Description
1	$-19.5 \text{ dB} \leq \text{rsrq} < -19 \text{ dB}$
2	$-19 \text{ dB} \leq \text{rsrq} < -18.5 \text{ dB}$
...	...
32	$-4 \text{ dB} \leq \text{rsrq} < -3.5 \text{ dB}$
33	$-3.5 \text{ dB} \leq \text{rsrq} < 3 \text{ dB}$
34	$-3 \text{ dB} \leq \text{rsrq}$
255	not known or not detectable

**rsrp**

Integer. Reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4).

**Table 8-6:** *rsrp*

Value	Description
0	$\text{rsrp} < -140 \text{ dBm}$
1	$-140 \text{ dBm} \leq \text{rsrp} < -139 \text{ dBm}$
2	$-139 \text{ dBm} \leq \text{rsrp} < -138 \text{ dBm}$
...	...
95	$-46 \text{ dBm} \leq \text{rsrp} < -45 \text{ dBm}$
96	$-45 \text{ dBm} \leq \text{rsrp} < -44 \text{ dBm}$
97	$-44 \text{ dBm} \leq \text{rsrp}$
255	not known or not detectable

## 8.3 Hard Reset: ^RESET

### 8.3.1 Syntax

Command	Possible Response(s)
AT^RESET	Device is reset
	+SHUTDOWN ... +SYSSTART

### 8.3.2 Description

This command performs an hardware reset.

### 8.3.3 Unsolicited Responses +SHUTDOWN, +SYSSTART

Please refer to Section [Unsolicited Commands +SHUTDOWN, +SYSSTART](#).



## 8.4 Change PIN with <aid>: +SCPWD

### 8.4.1 Syntax

Command	Possible Response(s)
<code>AT+SCPWD=, &lt;pin&gt;,&lt;newPin&gt;[,&lt;aid&gt;]&lt;fac&gt;, &lt;pin&gt;,&lt;newPin&gt;[,&lt;aid&gt;]</code>	<code>+CME ERROR:err</code>

### 8.4.2 Description

This command allows changing PIN with *aid*.

### 8.4.3 Defined Values

**fac**

Facility type. Only the facility "SC" is supported.

**pin**

value of PIN code

**newpin**

value of new PIN code

**aid**

Application ID, if omitted USIM application is used

### 8.4.4 Example

```
AT+SCPWD="SC", 1234,5678,A0000000871004010203040506070809  
OK
```

## 8.5 Board Thermistor Measurement +SMDTH

### 8.5.1 Syntax

Command	Possible response(s)
+SMDTH	+SMDTH : <i>temperature</i> +SMT ERROR : <i>err</i>
+SMDTH=?	

### 8.5.2 Description

The command provides thermistor measurement block which gives an absolute value of the temperature.

### 8.5.3 Defined Values

The following values are defined:

*temperature*

Measured temperature in degrees Celsius. -1 error code otherwise.

*err*

Error list:

- NA: Temperature service is not available for this RFIC chip.
- ONGOING: Measurement is on-going.

## 8.6 Unsolicited Commands +SHUTDOWN, +SYSSTART

### 8.6.1 Syntax

Command	Possible Response(s)
	+SYSSTART
	+SHUTDOWN

### 8.6.2 Description

+SYSSTART URC indicates that the ME has started (or restarted after a ^RESET) and is ready to operate again.

+SHUTDOWN URC indicates that the ME has completed the reset procedure and will restart.

The unsolicited command +SYSSTART is issued at each start or reboot. It signals that the device is ready for operation.

## 8.7 Device Shutdown: +SQNSSHDN

### 8.7.1 Syntax

Command	Possible Response(s)
AT+SQNSSHDN	+CME ERROR:<err>
AT+SQNSSHDN=?	OK

### 8.7.2 Description

Set command causes device detach from the network and shutdown. Before definitive shutdown an OK response is returned. After the issuing of this command, any previous activity is terminated and the device will not respond to any further command.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

### 8.7.3 URC +SQNSSHDN

The +SQNSSHDN URC is issued on the AT port when the power down process has completed. This indicates that the power supply of the device can be safely cut.

## 8.8 Read RSRP Values: +VZWRSP

### 8.8.1 Syntax

---

**Note:** This command is implemented according to the definitions in *Device Requirements LTE AT Commands For Test Automation* from Verizon Wireless™.

---

Command	Possible Response(s)
AT+VZWRSP	+VZWRSP: <cellID>1, <EARFCN>1, <RSRP>1, <cellID>2, <EARFCN>2, <RSRP>2, ..., <cellID>n, <EARFCN>n, <RSRP>n +CME ERROR:err

### 8.8.2 Description

Execution command returns the RSRP values for all cells which the UE is measuring. The device shall be capable of returning the RSRP values of up to 8 cells. The device shall support this command in both RRC\_IDLE and RRC\_CONNECTED modes.

If command fails, +CME ERROR: <err> is returned.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

## 8.9 Read RSRQ Values: +VZWRSRQ

### 8.9.1 Syntax

**Note:** This command is implemented according to the definitions in *Device Requirements LTE AT Commands For Test Automation* from Verizon Wireless™.

Command	Possible Response(s)
AT+VZWRSRQ	+VZWRSRQ: <cellID>1, <EARFCN>1, <RSRQ>1, <cellID>2, <EARFCN>2, <RSRQ>2, ..., <cellID>n, <EARFCN>n, <RSRQ>n +CME ERROR:err

### 8.9.2 Description

Execution command returns the RSRQ values for all cells which the UE is measuring. The device shall be capable of returning the RSRQ values of up to 8 cells. The device shall support this command in both RRC\_IDLE and RRC\_CONNECTED modes.

If command fails, +CME ERROR: <err> is returned.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

# 9

## USIM Commands

### 9.1 Restricted SIM Access: +CRSM

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

#### 9.1.1 Syntax

Command	Possible Response(s)
<code>AT+CRSM= &lt;command&gt;[,&lt;fileid&gt;[,&lt;P1&gt;,&lt; P2&gt;,&lt;P3&gt;[,&lt;data&gt;[,&lt;pathid&gt;]]] ]</code>	<code>+CRSM: &lt;sw1&gt;,&lt;sw2&gt;[,&lt;response&gt;] +CME ERROR: &lt;err&gt; OK</code>
<code>AT+CRSM=?</code>	

#### 9.1.2 Description

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the MT the SIM <command> and its required parameters. If a SIM installed in the currently selected card slot, the MT handles internally all SIM MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters. Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the MT is implementation dependent.

However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

### 9.1.3 Defined Values

#### **command**

command passed on by the MT to the SIM. refer 3GPP TS 51.011 [28].

**Table 9-1:** *command*

Value	Description
176	READ BINARY
178	READ RECORD
192	GET RESPONSE
214	UPDATE BINARY
220	UPDATE RECORD
242	STATUS
203	RETRIEVE DATA
219	SET DATA

Note: all other values are reserved.

NOTE 1:The MT internally executes all commands necessary for selecting the desired file, before performing the actual command.

#### **fileid**

Integer. Identifier of a elementary datafile on SIM. Mandatory for every command except STATUS

NOTE 2:The range of valid file identifiers depends on the actual SIM and is defined in 3GPP TS 51.011 [28]. Optional files may not be present at all.

#### **P1, P2, P3**

Integer. Parameters passed on by the MT to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in 3GPP TS 51.011.

#### **data**

Hexadecimal. Information which shall be written to the SIM. See also Section [Select TE Character Set: +CSCS](#).

#### **pathid**



String. Path of an elementary file on the SIM/UICC in hexadecimal format as defined in ETSI TS 102 221 [60] (e.g. "7F205F70" in SIM and UICC case). The <pathid> shall only be used in the mode "select by path from MF" as defined in ETSI TS 102 221 [60].

NOTE 3: Since valid elementary file identifiers may not be unique over all valid dedicated file identifiers the <pathid> indicates the targeted UICC/SIM directory path in case of ambiguous file identifiers. For earlier versions of this specification or if <pathid> is omitted, it could be implementation specific which one will be selected.

**sw1, sw2**

Integer. Information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

**response**

Hexadecimal. Response of a successful completion of the command previously issued. See also Section [Select TE Character Set: +CSCS](#). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer 3GPP TS 51.011 [28]). After READ BINARY, READ RECORD or RETRIEVE DATA command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY, UPDATE RECORD or SET DATA command.

## 9.2 Generic SIM Access: +CSIM

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 9.2.1 Syntax

Command	Possible Response(s)
AT+CSIM= <length>, <command>	+CSIM: <length>,<response>  +CME ERROR: <err> OK
AT+CSIM=?	

### 9.2.2 Description

The “Set” command transmits to the MT the <command> it then shall send as it is to the SIM. In the same manner the SIM <response> shall be sent back by the MT to the TA as it is. See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

This command allows a direct control of the SIM by an distant application on the TE. The TE shall then take care of processing SIM information within the frame specified by GSM/UMTS.

---

**Note:** Compared to Restricted SIM Access command +CRSM, the definition of +CSIM allows TE to take more control over the SIM MT interface. The locking and unlocking of the interface may be done by a special <command> value or automatically by TA/MT (by interpreting <command> parameter). In case that TE application does not use the unlock command (or does not send a <command> causing automatic unlock) in a certain timeout value, MT may release the locking.

---

## 9.2.3 Defined Values

### **length**

Integer. Length of the characters that are sent to TE in <command> or <response> (two times the actual length of the command or response).

### **command**

Hexadecimal. Command passed on by the MT to the SIM in the format as described in 3GPP TS 51.011 [28]. See also Section [Select TE Character Set: +CSCS](#).

### **response**

Hexadecimal. response to the command passed on by the SIM to the MT in the format as described in 3GPP TS 51.011 [28]. See also Section [Select TE Character Set: +CSCS](#).

## 9.3 Activate USAT Profile: +CUSATA

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

### 9.3.1 Syntax

Command	Possible Response(s)
+CUSATA[=<activation>]	+CUSATA:<UICC_state>[,<additional_profile_support>] +CME ERROR:<err>
AT+CUSATA=?	+CUSATA:(list of supported <activation>s)

### 9.3.2 Description

Execution command +CUSATA retrieves the current UICC state or downloads a profile to the UICC and/or activates handling of the TE profile facilities.

A positive result upon a +CUSATA=1 or +CUSATA=3 command (also) enables TE profile facility handling via unsolicited result codes +CUSATP: <proactive\_command> and +CUSATEND. The MT uses the unsolicited result code +CUSATP: <proactive\_command> to forward to the TE proactive commands issued by the UICC. The unsolicited result code +CUSATEND is issued by the MT when the UICC indicates that the proactive command session is terminated, i.e. in response to a USAT terminal response, the UICC indicates that no other USAT proactive command is pending. Lastly, terminal responses to the proactive commands can now be issued with +CUSATT=<terminal\_response> and envelope commands can be issued with +CUSATE=<envelope\_command>.

If the action requested by the +CUSATA command can not be performed, the information response +CUSATA: <UICC\_state>, [<additional\_profile\_support>] is returned with appropriate values, followed by the final result code +CME ERROR: 4 (Operation not supported) in case the UICC does not support USAT at all, or the final result code +CME ERROR: 3 (Operation not allowed) in all other cases.

If the UICC is already in active state and the UICC does not support the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]), the TE has the option to perform a reset of the UICC or use +CFUN to get back to an initial non-active UICC state. The +CUSATD command can be used to set profile handling upon the next restart.

All USAT proactive commands that the MT does not process itself and all terminal responses from the TE are transparently forwarded by the MT. The routing mechanism for USAT commands supported by both entities is specified in 3GPP TS 31.111 [92].

Test command returns values supported as a compound value.

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

### 9.3.3 Defined Values

#### activation

Integer type.

**Table 9-2:** *activation*

Value	Description
0	Return status information only, in information response: +CUSATA: <UICC_state>[, <additional_profile_support>].
1	Enable TE profile facility handling only, no profile download. This action can only be used if the combined TE and MT profile was downloaded during start-up (setting +CUSATD=1).
2	Download MT default profile.
3	Download the combined TE and MT profile (merger of the profiles written by +CUSATW) an enable TE profile facility handling. The rules for merging profiles are defined in 3GPP TS 31.111 [92].

#### UICC\_state

Integer type. Parameter reports that the UICC entered a new state during start-up or that the UICC ended startup and entered active state.

**Table 9-3:** *UICC\_state*

Value	Description
0	UICC start-up in progress, before profile download.
1	UICC start-up halted and ready for profile download. This state is reached if +CUSATD=2 was issued before restart. UICC start-up will continue upon +CUSATA=2 or +CUSATA=3.
2	Profile download completed, UICC startup continuing.
3	UICC awaiting PIN verification.

**Table 9-3:** *UICC\_state* (Continued)

Value	Description
4	UICC active.

**additional\_profile\_support**

Integer type. Indicates whether the UICC supports the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]). The value may not be available during early phases of start-up.

**Table 9-4:** *additional\_profile\_support*

Value	Description
0	No support.
1	Supported.

**proactive\_command**

String type in hexadecimal character format. Proactive command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.

## 9.4 Profile Download upon Start-Up: +CUSATD

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 9.4.1 Syntax

Command	Possible Response(s)
+CUSATD=[<download>[,<reporting>]]	+CME ERROR: <err> OK
AT+CUSATD?	+CUSATD: <download>,<reporting>
AT+CUSATD=?	+CUSATD: (list of supported <download>s), (list of supported <reporting>s)

### 9.4.2 Description

This command determines if, and optionally which profile should be downloaded to the UICC automatically upon startup. If, prior to a restart/start-up, the +CUSATD settings have not been altered, then the default settings determine the behaviour upon start-up. However, if the parameters of +CUSATD has been set to other than default and then a restart is performed (e.g. by +CFUN), these values determine the behaviour. This is true for one restart only after altering +CUSATD parameters as they are always reset to default at the end of the next UICC start-up (i.e. when the USIM initialisation as specified in 3GPP TS 31.102 [98] has been completed).

The command without parameters resets the parameters to their default values.

The command can only be used if the UICC is already in active state (<UICC\_state> 4, e.g. upon +CUSATA) or in download completed state (<UICC\_state> 2) and the UICC does not support the "Additional TERMINAL PROFILE after UICC activation" feature (see 3GPP TS 31.111 [92]). In all other cases the command responds with +CME ERROR: 14 (SIM busy).

+CUSATD=<download>, 1 also enables the unsolicited result code +CUSATS: <UICC\_state>. The MT uses this unsolicited result code to indicate that a profile download is performed (setting +CUSATD=0, 1 or +CUSATD=1, 1) or that it is ready for profile download (setting +CUSATD=2, 1). In both cases, the

MT also indicates the end of UICC start-up by the unsolicited result code +CUSATS: 4. If the UICC is awaiting PIN verification during start-up, this is also reported.

When using +CUSATD=1, the +CUSATA=1 command has to be used to enable TE profile facility handling after restart. In the time between profile download and issuance of +CUSATA=1, the UICC may already attempt to issue proactive commands. The MT will not send these to the TE, but rather give the UICC the response "terminal currently unable to process command" autonomously. The UICC may implement only a limited number of retries, which can potentially leave USAT in an unwanted state if the +CUSATA=1 command arrives late.

---

**Note:** Care has to be taken when using +CUSATD=2. If no +CUSATA=2 or +CUSATA=3 is sent during startup, USAT is also blocked for the MT.

---

Test command returns supported values as compound values.

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

## 9.4.3 Defined Values

### download

Integer type. Parameter decides when/if to perform a profile download to UICC and which profile to ownload. The default value is implementation specific.

**Table 9-5:** *download*

Value	Description
0	Download MT default profile automatically during next start-up.
1	Download the combined TE and MT profile (merger of the profiles written by +CUSATW) automatically during next start-up. The rules for merging profiles are defined in 3GPP TS 31.111 [92].
5	Halt next UICC start-up when ready for profile download. Profile to download will be selected and download will be triggered by +CUSATA.



### reporting

Integer type. Parameter enables unsolicited result code +CUSATS: <UICC\_state> to notify the TE about a new state during start-up.

**Table 9-6:** *reporting*

Value	Description
0	Disable +CUSATS, i.e. no notification.
1	Enable +CUSATS, i.e. notify TE.

### UICC\_state

Integer type. Parameter reports that the UICC entered a new state during start-up or that the UICC ended startup and entered active state.

**Table 9-7:** *UICC\_state*

Value	Description
0	UICC start-up in progress, before profile download.
1	UICC start-up halted and ready for profile download. This state is reached if +CUSATD=2 was issued before restart. UICC start-up will continue upon +CUSATA=2 or +CUSATA=3.
2	Profile download completed, UICC startup continuing.
3	UICC awaiting PIN verification.
4	UICC active.

## 9.5 Send USAT Envelope Command: +CUSATE

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

### 9.5.1 Syntax

Command	Possible Response(s)
+CUSATE=< <i>envelope_command</i> >	+CME ERROR: <err>
AT+CUSATT=?	

### 9.5.2 Description

Execution command sends a USAT terminal response to the MT as an answer to a preceding USAT proactive command sent from the UICC with unsolicited result code +CUSATP: <proactive\_command> (see +CUSATA command description).

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

## 9.5.3 Defined Values

### **envelope\_command**

String type in hexadecimal character format. Envelope command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.

### **envelope\_response**

String type in hexadecimal character format. Response to the envelope command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object. An empty string is provided if the UICC does not have any response data to provide.

### **busy**

Integer type.

**Table 9-8:** *busy*

Value	Description
0	UICC indicated normal ending of the command.
1	UICC responded with USAT is busy, no retry by the MT.
2	UICC responded with USAT is busy even after one or more retries by the MT.

### **sw1**

Integer type. Status word information from the envelope response returned by the UICC as defined in ETSI TS 102 221 [60], subclause 10.2. The parameter can be delivered to the TE both in the case of successful and failed execution of the envelope command.

### **sw2**

Integer type. For description, see <sw1>.

## 9.6 Read USAT Profile: +CUSATR

---

**Note:** This command is described in *3GPP TS 27.007*. See Section *References*.

---

### 9.6.1 Syntax

Command	Possible Response(s)
AT+CUSATR [=<profile_storage>]	[+CUSATR: <profile_storage>,<profile>][<CR><LF>+CUSATR:<profile_storage>,<profile>[...]] +CME ERROR: <err> OK
AT+CUSATR=?	+CUSATR: (list of supported <profile_storage>s)

### 9.6.2 Description

Execution command +CUSATR=<profile\_storage> returns the profile specified by <profile\_storage>.

Execution command issued without parameter +CUSATR returns all profiles.

Test command returns values supported as a compound value.

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

## 9.6.3 Defined Values

**profile\_storage**  
Integer type.

**Table 9-9:** *profile\_storage*

Value	Description
0	TE profile that can be set with +CUSATW.
1	MT profile that can be set with +CUSATW.
2	MT default profile that reflects the inherent, default supported facilities of the MT.
3	UICC profile that reflects the currently active UICC profile that was sent to the UICC in the last TERMINAL?PROFILE command.
4	UICC EF <sub>UST</sub> . The elementary file that indicates services available in the USIM.
5	List of MT only facilities (facilities that are not allowed to be assigned to the TE, see 3GPP TS 31.111 [92]).

**profile**

string type in hexadecimal character format. The profile describing the supported facilities of the referenced <profile\_storage> as specified for the Terminal Profile in 3GPP TS 31.111 [92] or for the related EF in 3GPP TS 31.102 [59].S

## 9.7 Send USAT Terminal Response: +CUSATT

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 9.7.1 Syntax

Command	Possible Response(s)
+CUSATT=<terminal_response>	+CUSATE: <envelope_response>[,<busy>] [<CR><LF>+CUSATE2: <sw1>,<sw2>] +CME ERROR: <err>
AT+CUSATE=?	

### 9.7.2 Description

Execution command allows the TE to send a USAT envelope command to the MT. If the UICC provides response data to the command or indicates that USAT is busy, the information response +CUSATE: <envelope\_response> [, <busy>] is returned. A second line of information response +CUSATE2: <sw1> , <sw2> may be provided if the MT presents the status words provided by the UICC.

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

### 9.7.3 Defined Values

#### terminal\_response

String type in hexadecimal character format. Terminal response to a proactive command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.

## 9.8 Write USAT Profile: +CUSATW

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 9.8.1 Syntax

Command	Possible Response(s)
AT+CUSATW [=<profile_storage>[,<pr? ofile>]]	+CUSATW: <profile_storage>,< <conflict_profile> +CME ERROR: <err> OK
AT+CUSATW=?	+CUSATW: (list of supported <profile_storage>s)

### 9.8.2 Description

Execution command +CUSATR=<profile\_storage> returns the profile specified by <profile\_storage>.

Execution command issued without parameter +CUSATR returns all profiles.

Test command returns values supported as a compound value.

Refer to Section [Mobile Termination Error Result Code: +CME ERROR](#) for details on <err>.

## 9.8.3 Defined Values

### **profile\_storage**

Integer type.

**Table 9-10:** *profile\_storage*

Value	Description
0	TE. Refers profile storage for the facilities supported by the TE. Default value is a blank profile with all bits set to zero. This value is applicable both in the execution command and in the information response.
1	MT. Refers profile storage for the facilities to be supported by MT, which can be a subset of the default MT facilities. The TE can choose to register a subset of the MT default profile, typically omitting facilities also supported by the TE profile. Default value is the MT default profile. This value is applicable both in the execution command and in the information response.
5	Refers to a conflict between the TE profile and the list of MT only facilities. This value is not applicable in the execution command.

### **profile**

String type in hexadecimal character format. The profile describing the supported USAT facilities of the referenced <profile\_storage> as specified for the Terminal Profile in 3GPP TS 31.111 [92].

### **conflict\_profile**

String type in hexadecimal character format. A bitwise AND of two profiles, showing the conflicts, that is, USAT facilities supported by both profiles. See description of Terminal Profile in 3GPP TS 31.111 [92].



## 9.9 USIM-Related Unsolicited Result Codes

---

**Note:** This command is described in 3GPP TS 27.007. See Section *References*.

---

### 9.9.1 Syntax and Description

URC	Description
+CUSATEND	The unsolicited result code +CUSATEND is issued by the MT when the UICC indicates that the proactive command session is terminated, i.e. in response to a USAT terminal response, the UICC indicates that no other USAT proactive command is pending
+CUSATP:<proactive_command>	The MT uses the unsolicited result code +CUSATP: <proactive_command> to forward to the TE proactive commands issued by the UICC.
+CUSATS:<UICC_state>	The MT uses this unsolicited result code to indicate that a profile download is performed (setting +CUSATD=0,1 or +CUSATD=1,1) or that it is ready for profile download (setting +CUSATD=2,1). In both cases, the MT also indicates the end of UICC start-up by the unsolicited result code +CUSATS: 4. If the UICC is awaiting PIN verification during start-up, this is also reported.

## 9.9.2 Defined Values

### UICC\_state

Integer type. Parameter reports that the UICC entered a new state during start-up or that the UICC ended startup and entered active state.

**Table 9-11:** *UICC\_state*

Value	Description
0	UICC start-up in progress, before profile download.
1	UICC start-up halted and ready for profile download. This state is reached if +CUSATD=2 was issued before restart. UICC start-up will continue upon +CUSATA=2 or +CUSATA=3.
2	Profile download completed, UICC startup continuing.
3	UICC awaiting PIN verification.
4	UICC active.

### proactive\_command

String type in hexadecimal character format. Proactive command as defined in 3GPP TS 31.111 [92], consisting of the full BER-TLV data object.

---

# 10 Modem Configuration Commands

## 10.1 Auto-Connect: +SQNAUTOCONNECT

### 10.1.1 Syntax

Command	Possible Response(s)
<code>AT+SQNAUTOCONNECT =&lt;autoconnect&gt;[,forceautoconnect]</code>	OK
<code>AT+SQNAUTOCONNECT ?</code>	+SQNAUTOCONNECT:<autoconnect> OK
<code>AT+SQNAUTOCONNECT =?</code>	+SQNAUTOCONNECT: (0,1), (0,1) OK

### 10.1.2 Description

The set command changes the autoconnect mode of the device. When enabled, the device will automatically set the UE to its maximal functionality (equivalent to AT+CFUN=1) after each reboot. This setting is persistent across reboot.

The read command returns the current autoconnect mode.

The test command returns the possible autoconnect values.

## 10.1.3 Defined Values

### **autoconnect**

String. Autoconnect Mode.

**Table 10-1:** *autoconnect*

Value	Description
0	Autoconnect is disabled.
1	Autoconnect is enabled.

### **forceautoconnect**

String. Force autoconnect Mode.

**Table 10-2:** *forceautoconnect*

Value	Description
0	ForceAutoconnect if disabled, the Autoconnect is overridden to 0 in case of "3gpp-conformance", "verizon-conformance"
1	ForceAutoconnect is enabled.

## 10.1.4 Example

Enable autoconnect:

```
AT+SQNAUTOCONNECT=1
OK
```

Read the current autoconnect setting:

```
AT+SQNAUTOCONNECT?
+SQNAUTOCONNECT: 1
OK
```

## 10.2 Internet Auto-Connect: +SQNAUTOINTERNET

### 10.2.1 Syntax

Command	Possible Response(s)
AT+SQNAUTOINTERNET=<autointernet>	+CME ERROR:<err>
AT+SQNAUTOINTERNET?	+SQNAUTOINTERNET:<autointernet> OK
AT+SQNAUTOINTERNET=?	+SQNAUTOINTERNET:(0,1) OK

### 10.2.2 Description

The set command changes the `autointernet` mode of the device. When enabled, the device will automatically try to connect internet PDN provisioned into `/etc/config/sqnm` after each attach to the network.

This setting is persistent across reboot.

The read command returns the current `autointernet` mode.

The test command returns the possible `autointernet` values.

### 10.2.3 Defined Values

#### `autointernet`

Auto connect to Internet, integer [0-1].

**Table 10-3:** `autointernet`

Value	Description
0	Autointernet is disabled
1	Autointernet is enabled

## 10.3 ICCID Read: +SQNCCID

### 10.3.1 Syntax

Command	Possible Response(s)
AT+SQNCCID	+CME ERROR: <err>
AT+SQNCCID?	+SQNCCID: <iccid>[,<euiccid>] OK +CME ERROR: <err>
AT+SQNCCID=?	+CME ERROR: <err>

### 10.3.2 Description

The execution command reads the ICCID (card identification number) on the SIM card.

**Caution:** Reading the CCID of the SIM card is only possible under CFUN=1 and CFUN=4. Any reading attempt while the modem is not in one of those cases will be unsuccessful and return no error. The modem must be under CFUN=1 or CFUN=4 state to be able to read the CCID.

The test command returns OK result code.

### 10.3.3 Defined Values

**iccid**

String. USIM integrated circuit card ID.

**euiccid**

String. eUICCID of the SIM card.

## 10.4 Conformance Test Mode: +SQNCTM

### 10.4.1 Syntax

Command	Possible Response(s)
AT+SQNCTM=<ctm>	OK
AT+SQNCTM?	+SQNCTM:<ctm> OK
AT+SQNCTM=?	+SQNCTM: ("standard", "3gpp-conformance", list of supported operators) OK

### 10.4.2 Description

The set command changes the conformance test mode of the device.

---

**Caution:** The change will be effective after the device's reboot.

---

The read command returns the current conformance test mode.

The test command returns the supported conformance test modes.

---

**Note:** The values not listed in [Table 10-4](#) are reserved for Sequans use and should not be used.

---

## 10.4.3 Defined Values

**ctm**

String. Conformance Test Mode.

**Table 10-4:** *ctm*

Value	Description
"standard"	Standard 3GPP mode
"3gpp-conformance"	Standard 3GPP mode to pass GCF tests
"operator_name"	Test mode related to a specific supported operator.  <b>Note:</b> Please use AT+SQNCTM=? to confirm the list of the operators supported in the current software release.
Other values	Reserved

## 10.4.4 Example

Change the conformance test mode to "3gpp-conformance" to run PS tests:

```
AT+SQNCTM="3gpp-conformance"  
OK  
AT^RESET
```

Read the current conformance test mode:

```
AT+SQNCTM?  
+SQNCTM: "3gpp-conformance"  
OK
```



## 10.5 Read the Home PLMN: +SQNHPLMN

### 10.5.1 Syntax

Command	Possible Response(s)
AT+SQNHPLMN?	+SQNHPLMN:<num_oper>,<short_oper>,<long_oper>, OK

### 10.5.2 Description

This command reads the HPLMN.

### 10.5.3 Defined Values

#### num\_oper

Numeric format: the GSM Location Area Identification number (refer to 3GPP TS 24.008 [8] subclause 10.5.1.3). Country code with three BCD digits coded as in ITU-T Recommendation E.212 [10] Annex A, plus a two BCD digit network code, which is administration specific.

The returned <num\_oper> value is not in BCD format, but in IRA characters converted from BCD, so the number has the following format:

(country digit3) (country digit2) (country digit1) (network digit3) (network digit2) (network digit1)

#### short\_oper

String. Short alphanumeric format of the operator name: up to 8 characters (refer to GSM MoU SE.13 [9]).

#### long\_oper

String. Long alphanumeric format of the operator name, up to 16 characters.

### 10.5.4 Example

```
AT+SQNHPLMN?  
+SQNHPLMN: "00101", "TEST", "Aeroflex"  
OK
```

## 10.6 Change STK APN Configuration: +SQNSTKAPNE

### 10.6.1 Syntax

Command	Possible Response(s)
AT+SQNSTKAPNE= <apnname>, <iptype>, <enabled>	OK
AT+SQNSTKAPNE?	+SQNSTKAPNE : <apnname>, <iptype>, <enabled> OK
AT+SQNSTKAPNE=?	+SQNSTKAPNE : <apnname>, (ip, ipv6, ipv4v6), (0,1) OK

### 10.6.2 Description

The set command changes the STK APN configuration. If the UICC STK application does not provide the APN in the open channel, this configuration will be used instead.

This setting is not persistent across reboot.

The read command returns the current configuration.

The test command returns the possible values.

## 10.6.3 Defined Values

### **iptype**

String. IP type description.

**Table 10-5:** *iptype*

Value	Description
ip	IPv4 only
ipv6	IPv6 only
ipv4v6	IPv4 and IPv6

### **enabled**

Integer. Status.

**Table 10-6:** *enabled*

Value	Description
0	APN is disabled
1	APN is enabled

## 10.6.4 Example

Set STK APN:

```
AT+SQNSTKAPNE="stktest","ipv4v6",1  
OK
```

Read the current autoconnect setting:

```
AT+SQNSTKAPNE?  
+SQNSTKAPNE: stktest,ipv4v6,1  
OK
```

# 11

## VoLTE or PPP Related Commands

### 11.1 Dial Number ATD

#### 11.1.1 Syntax

Command	Possible Response(s)
<code>ATD&lt;num&gt;[;]</code>	<code>&lt;status&gt;</code>
<code>ATD*99[*[&lt;called_address&gt;][ * [&lt;L2P&gt;][* [&lt;cid&gt;]]]#</code>	CONNECT NO CARRIER ERROR +CME ERROR : <err>

#### 11.1.2 Description

ATD is used to set up outgoing voice call.

The syntax `ATD*99#` causes the MT to perform whatever actions are necessary to establish a communication between the TE and the external PDN. See also [11.2 Setup PPP Connection ATD\\*99](#) on page 262.

## 11.1.3 Defined Values

### num

String of dialing digits and optional V.250 modifiers: 0-9, \*, #, +, A, B, C, D and p.

### status

String. Result of the command.

**Table 11-1:** *status*

Value	Description
OK	Call successfully dial and start to ring back
BUSY	MT side busy
NO CARRIER	No network

### called\_address

String. IP V4 address in the form w.x.y.z, which identifies the called party; if it is provided, the MT will automatically set up a virtual call to the specified address after the context has been activated. This parameter is currently not used and needs not to be specified.

### L2P

String. Layer 2 protocol to be used between the TE and MT.

**Table 11-2:** *L2P*

Value	Description
PPP	Default value. Layer 2 protocol PPP
1	Layer 2 protocol PPP

### cid

Integer. This parameter specifies a particular PDP context definition.

---

**Note:** If this parameter is omitted, <cid>=3 (Internet PDN) is the default value for all implementations except CAT-M. For CAT-M implementation, <cid>=1 (Internet PDN) is the default value.

---

## 11.1.4 Example

```
ATD
OK
```

# 11.2 Setup PPP Connection ATD\*99

## 11.2.1 Syntax

Command	Possible Response(s)
<b>ATD*99</b> [* [<protocol>]]* [<cid >]]#	NO CARRIER ERROR +CME ERROR: <err>

## 11.2.2 Description

AT+CGDATA allows to establish PPP connection with the Host.

Upon a succesful LCP negotiation, the Host acquires public PDP addresse(s) and the AT channel enters data mode.

The user should use '+++ ' to suspend data mode and switch back to AT command mode.

## 11.2.3 Defined Values

### protocol

String. The only supported value is "PPP".

### cid

Integer in [1-8]. Internet Primary Context ID.

## 11.3 Call Control Hang-Up a Call: ATH

### 11.3.1 Syntax

Command	Possible Response(s)
ATH	OK

### 11.3.2 Description

This command releases all active and held calls.

Hang-up (exit the PPP online mode). The command terminates all PPP sessions. It may be used from another AT command interface to terminate dial-up connections.

PPP will go through LCP Terminate procedure and PPP is considered as closed after the NO CARRIER notification.

### 11.3.3 Example

```
ATH
OK
```

## 11.4 Return to Online Data State: ATO

### 11.4.1 Syntax

Command	Possible Response(s)
<code>ATO[&lt;value&gt;]</code>	<code>&lt;result_code&gt;</code> OK

### 11.4.2 Description

Causes the DCE to return to online data state and issue a `CONNECT` or `CONNECT <text>` result code. This command may not be aborted.

This command is used to resume the data mode that might be suspended by the `+++` escape sequence.

In case of PPP session, the command resumes the PPP session previously suspended by `+++`.

This command performs the same actions as `AT+CGDATA` without establishing the external network access.



## 11.4.3 Defined Values

### value

Integer. 0 represents Return to online data state from online command state. Also used to retrain after a modem-on-hold transaction or to reconnect to a modem that has been placed in anon-hold state per V.92.

Other values are reserved.

### result\_code

String. Result of the command.

**Table 11-3:** *result\_code*

Value	Description
CONNECT	If connection is successfully resumed and X0 is selected
CONNECT <text>	If connection is successfully resumed and Xn is selected where "n" is any value other than 0
NO CARRIER	If connection is not successfully resumed
ERROR	If <value> is not recognized or supported

## 11.4.4 Example

```
ATO
OK
```

---

# 12 Sequans IP Data Basic Commands

## 12.1 Socket Accept: +SQNSA

### 12.1.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSA=&lt;connId&gt;[,&lt;connMode&gt;]</code>	Possible intermediate response: CONNECT OK ERROR NO CARRIER +CME ERROR:<err>
<code>AT+SQNSA=?</code>	+SQNSA: (1-6) [, (0-1)]

### 12.1.2 Description

Execution command accepts an incoming socket connection after an unsolicited result code +SQNSRING: <connId>. Note that this +SQNSRING URC is the consequence of the creation of a socket listen (+SQNSL).

Setting the command before having received a +SQNSRING URC will result in an ERROR indication, with information that a connection request has not yet been received.

Use +SQNSH command to reject the connection.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Test command returns the range of supported values for all the subparameters.

## 12.1.3 Defined Values

### connId

Socket connection identifier, integer [1-6].

### connMode

Connection mode, optional, integer [0-1].

**Table 12-1:** *connMode*

Value	Description
0	Default. Online data mode
1	Command mode

## 12.1.4 Example

- General syntax:

```
at+sqnsa=?  
+SQNSA: (1-6) [, (0-1)]  
OK
```

```
at+sqnsa=1  
CONNECT
```

```
at+sqnsa=2,1  
OK
```

- Opening listening TCP socket on port 1234.

```
AT+SQNSL=1,1,1234  
OK
```

- +SQNSRING URC indicates here that there is incoming connection on socket #1.

```
+SQNSRING: 1
```

- Accept connection in command mode.

```
AT+SQNSA=1,1  
OK
```

- Check socket status. There is a connection with remote host on 192.168.15.135:41829.

```
AT+SQNSS  
+SQNSS: 1,2,192.168.15.1,1234,192.168.15.135,41829  
+SQNSS: 2,0  
+SQNSS: 3,0  
+SQNSS: 4,0  
+SQNSS: 5,0  
+SQNSS: 6,0  
OK
```

- +SQNSRING URC indicates that some data is received on socket #1.

```
+SQNSRING: 1
```

- Receive up to 10 bytes from 1st socket. 6 bytes are actually received.

```
AT+SQNSRECV=1,10
```

```
+SQNSRECV: 1,6
```

```
Test!
```

```
OK
```

- Send some text to socket. Note the final <Ctrl+Z> before <CR>.

```
AT+SQNSSEND=1
```

```
> Some text <Ctrl+Z>
```

```
OK
```

- Shutdown connection.

```
AT+SQNSH=1
```

```
OK
```

## 12.2 Socket Configuration: +SQNSCFG

### 12.2.1 Syntax

Command	Possible Response(s)
AT+SQNSCFG=<connId>,<cid>,<pktSz>,<maxTo>,<connTo>,<txTo>	OK ERROR +CME ERROR:<err>
AT+SQNSCFG?	+SQNSCFG:<connId1>,<cid1>,<pktSz1>,<maxTo1>,<connTo1>,<txTo1><CR><LF> ... +SQNSCFG:<connId6>,<cid6>,<pktSz6>,<maxTo6>,<connTo1>,<txTo6> OK
AT+SQNSCFG=?	+SQNSCFG:(1-6),(0-6),(0-1500),(0-65535),(0,10-1200),(0-255) OK

### 12.2.2 Description

This command sets the socket configuration parameters.

---

**Note:** These values are automatically saved in the device's NVRAM.

---

## 12.2.3 Defined Values

### connId

Integer in range [1-6]. Socket connection identifier.

### cid

Integer in range [0-6]. PDP context identifier.

### pktSz

Integer in range [0-1500]. Packet size to be used by the TCP/UDP/IP stack for data sending. Used for online data mode only.

**Table 12-2:** *pktSz*

Value	Description
0	Automatically chosen by the device (default 300)
[1-1500]	Packet size in bytes.

### maxTo

Integer in range [0-65535]. Exchange timeout. If there is no data exchange within this timeout period, then the connection is closed.

---

**Note:** This value is ignored if the socket is in listening state.

---

**Table 12-3:** *maxTo*

Value	Description
0	No timeout.
[1-65535]	Timeout value in seconds (default 90 s.).

### connTo

Integer in range [0,10-1200]. Connection timeout. If a connection to the remote can't be established within this timeout period, then an error is raised.

**Table 12-4:** *connTo*

Value	Description
0	No timeout.
[10-1200]	Timeout value in hundreds of milliseconds (default 600)

### txTo

Integer in range [0-255]. Data sending timeout. Data is sent even if less than max packet size, after this period. Used for online data mode only.

**Table 12-5:** *txTo*

Value	Description
0	No timeout.
[1-255]	Timeout value in hundreds of milliseconds (default 50).

## 12.2.4 Example

```
at+sqnscfg=?  
+SQNSCFG: (1-6), (0-5), (0-1500), (0-65535), (0,10-1200), (0-255)  
OK
```

```
at+sqnscfg?  
+SQNSCFG: 1,1,300,90,600,50  
+SQNSCFG: 2,1,300,90,600,50  
+SQNSCFG: 3,1,300,90,600,50  
+SQNSCFG: 4,1,300,90,600,50  
+SQNSCFG: 5,1,300,90,600,50  
+SQNSCFG: 6,1,300,90,600,50  
OK
```

```
at+sqnscfg=1,3,0,90,600,50  
OK
```

## 12.3 Socket Configuration Extended: +SQNSCFGEXT

### 12.3.1 Syntax

Command	Possible Response(s)
<b>AT+SQNSCFGEXT=&lt;connId&gt;,&lt;srMode&gt;,&lt;recvDataMode&gt;,&lt;keepalive&gt;,[&lt;listenAutoRsp&gt;],[&lt;sendDataMode&gt;[,&lt;unused_A&gt;[,&lt;unused_B&gt;]]]</b>	OK ERROR +CME ERROR:<err>
<b>AT+SQNSCFGEXT?</b>	+SQNSCFGEXT:<connId1>,<srMode1>,<recvDataMode1>,<keepalive1>,<listenAutoRsp1>,<sendDataMode1>,<unused_A1>,<unused_B1><CR><LF> ... +SQNSCFGEXT:<connId6>,<srMode6>,<recvDataMode6>,<keepalive6>,<listenAutoRsp6>,<sendDataMode6>,<unused_A6>,<unused_B6> OK
<b>AT+SQNSCFGEXT=?</b>	+SQNSCFGEXT:(1-6),(0-2),(0-1),(0-240)[,(0-1)[,(0-1)[,(0)[,(0)]]]] OK

### 12.3.2 Description

This command sets the socket configuration extended parameters.

**Note:** These values are automatically saved in the device's NVRAM.



## 12.3.3 Defined Values

### **connId**

Integer in range [1-6]. Socket connection identifier.

### **srMode**

Integer in range [0-2]. SQNSRING URC mode.

**Table 12-6:** *srMode*

Value	Description
0	Normal mode (default), SQNSRING : <connId>
1	Data amount mode, SQNSRING : <connId>,<recData>
2	Data view mode, SQNSRING: <connId>,<recData>,<data>

### **recvDataMode**

Integer in range [0-1]. "Received data view mode" presentation format.

**Table 12-7:** *recvDataMode*

Value	Description
0	Data represented as text (default)
1	Data represented as sequence of hexadecimal numbers (from 00 to FF). Note that this parameter changes the presentation of SQNSRING URC but not SQNSSEND. No conversion is done on the data before sending on the network.

### **keepalive**

Integer type [0-240]. Currently unused.

### **listenAutoRsp**

Integer in range [0-1]. "Listen auto-response mode", that affects AT+SQNSL command.

**Table 12-8:** *listenAutoRsp*

Value	Description
0	Deactivated (default). Call AT+SQNSA to accept incoming TCP connection.
1	Activated. Incoming TCP connection is automatically accepted. Modem remains in command mode.

**sendDataMode**

Integer in range [0-1]. "Sent data view mode" presentation format.

**Table 12-9:** *sendDataMode*

Value	Description
0	Data represented as text (default)
1	Data represented as sequence of hexadecimal numbers (from 00 to FF).

### 12.3.4 Example

```

at+sqnscfgext=?
+SQNSCFGEXT: (1-6),(0-2),(0-1),(0-240),(0-1),(0-1),(0),(0)
OK

at+sqnscfgext?
+SQNSCFGEXT: 1,0,0,0,0,0,0,0
+SQNSCFGEXT: 2,0,0,0,0,0,0,0
+SQNSCFGEXT: 3,0,0,0,0,0,0,0
+SQNSCFGEXT: 4,0,0,0,0,0,0,0
+SQNSCFGEXT: 5,0,0,0,0,0,0,0
+SQNSCFGEXT: 6,0,0,0,0,0,0,0
OK

at+sqnscfgext=1,0,0,0
OK
    
```

## 12.4 Socket Dial: +SQNSD

### 12.4.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSD=&lt;connId&gt;,&lt;txPort&gt;,&lt;rPort&gt;,&lt;IPaddr&gt;,&lt;closureType&gt;,&lt;lPort&gt;,&lt;connMode&gt;[,&lt;acceptAnyRemote&gt;]]]</code>	Possible intermediate response: CONNECT OK ERROR NO CARRIER +CME ERROR:<err>
<code>AT+SQNSD=?</code>	+SQNSD: (1-6), (0-1), (0-65535), <IPaddr> [, (0,255) [, (0-65535) [, (0-1) [, (0-1)]]]] OK

### 12.4.2 Description

This commands opens a remote connection via socket.

Notes:

1. If <connMode> is set to online mode connection and the command is successful, then we enter the 'online data mode' and we see the intermediate result code CONNECT. After the CONNECT, we can suspend the direct interface to the socket connection (the socket remains open) using the escape sequence (+++). The module moves back to 'command mode' and we receive the final result code OK after the suspension. After such a suspension, it is possible to resume at any moment (unless the socket inactivity timer time-outs, see [Socket Configuration: +SQNSCFG](#)) by using the [Socket Restore: +SQNSO](#) command with the corresponding <connId>.
2. If we set <connMode> to command mode connection and the command is successful, the socket is opened and we remain in 'command mode' and we see the result code OK.
3. If some data comes in through a connected socket and is not read because the module entered 'command mode' before reading it (after an escape sequence or after +SQNSD has been issued with <connMode> set to 'command mode' connection), this data is buffered and we receive the SQNSRING URC (SQNSRING presentation format depends on the last +SQNSCFGEXT setting). It is possible to read this data later with +SQNSRECV. Under the same hypothesis, it is possible to send data while in 'command mode' by issuing +SQNSSEND.

## 12.4.3 Defined Values

### connId

Integer in range [1-6]. Socket connection identifier.

### txProt

Integer type [0-1]. Transmission protocol

**Table 12-10:** *txProt*

Value	Description
0	TCP
1	UDP

### rPort

Integer type [0-65535]. Remote host port to contact.

### IPaddr

String type. Address of the remote host.

Any valid IP address in the format "xxx.xxx.xxx.xxx" or any host name solved with a DNS query.

### closureType

Integer type. Socket closure behaviour for TCP, has no effect for UDP connections.

**Table 12-11:** *closureType*

Value	Description
0	Local host closes immediately when remote host has closed (default)
255	Local host closes after an escape sequence (+++)

### lPort

Integer type in range [0-65535]. UDP connection local port, has no effect for TCP connections.

### connMode

Integer type [0-1]. Connection mode.

**Table 12-12:** *connMode*

Value	Description
0	Online mode connection (default)

**Table 12-12:** *connMode* (Continued)

Value	Description
1	Command mode connection

**acceptAnyRemote**

Integer type [0-1]. Determines whether receive datagrams from any another remote than <IPaddr> : <rPort> or not.

---

**Note:** This parameter is applicable to UDP connection only.

---

**Table 12-13:** *acceptAnyRemote*

Value	Description
0	Disabled (default)
1	Enabled

## 12.4.4 Example

```
at+sqnsd=?
+SQNSD: (1-6), (0-1), (0-65535), , (0, 255), (0-65535), (0-1)
OK

at+sqnsd=1,0,7,"10.10.10.4",0,0,0
CONNECT

at+sqnsd=1,0,80,"www.example.com",0,0,1
OK
```

## 12.5 Socket Shutdown: +SQNSH

### 12.5.1 Syntax

Command	Possible Response(s)
AT+SQNSH=<connId>	OK ERROR +CME ERROR:<err>
AT+SQNSH=?	+SQNSH: (1-6) OK
	(Unsollicited response) +SQNSH:<connId>

### 12.5.2 Description

This command closes a socket connection.

---

**Note:** A socket connection can be closed only when it is in suspended mode (even if data is pending). Trying to close an active socket connection will produce an error.

---

### 12.5.3 Defined Values

**connId**

Integer in range [1-6]. Socket connection identifier.

### 12.5.4 Example

```
at+sqnsh=?
+SQNSH: (1-6)
OK
```

```
at+sqnsh=1
OK
```

## 12.6 Socket Information: +SQNSI

### 12.6.1 Syntax

Command	Possible Response(s)
AT+SQNSI=<connId>	+SQNSI : <connId>,<sent>,<received>,<buff_in>,<ack_waiting> OK ERROR NO CARRIER +CME ERROR<err>
AT+SQNSI	+SQNSI : <connId1>,<sent1>,<received1>,<buff_in1>,<ack_waiting1><CR><LF> ... +SQNSI : <connId6>,<sent6>,<received6>,<buff_in6>,<ack_waiting6> OK
AT+SQNSI=?	+SQNSI : (1-6)

### 12.6.2 Description

Execution command is used to get information about socket data traffic.  
 Test command reports the range for parameter <connId>.

## 12.6.3 Defined Values

### **connId**

Integer in range [1-6]. Socket connection identifier.

### **sent**

Total amount (in bytes) of sent data since the last time the socket connection identified by <connId> has been opened.

### **received**

Total amount (in bytes) of received data since the last time the socket connection identified by <connId> has been opened.

### **buff\_in**

Total amount (in bytes) of data just arrived through the socket connection identified by <connId> and currently buffered, not yet read.

### **ack\_waiting**

Total amount (in bytes) of sent and not yet acknowledged data since the last time the socket connection identified by <connId> has been opened.

---

**Note:** Data not yet acknowledged is available only for TCP connections. The value <ack\_waiting> is always 0 for UDP connections.

---

## 12.6.4 Examples

- Read Command

```
AT+SQNSI=?
+SQNSI: (1-6)
OK
```

- Read Command

```
AT+SQNSI
+SQNSI: 1,32,75,8,0
+SQNSI: 2,0,0,0,0
+SQNSI: 3,0,0,0,0
+SQNSI: 4,0,0,0,0
+SQNSI: 5,0,0,0,0
+SQNSI: 6,0,0,0,0
OK
```

- Set connection 1

```
AT+SQNSI=1
+SQNSI: 1,0,0,0,0
OK
```



## 12.7 Socket Listen : +SQNSL

### 12.7.1 Syntax

Command	Possible Response(s)
<b>AT+SQNSL</b> =<connId>,<listenState>,<listenPort>[,<lingerT>]	OK ERROR +CME ERROR:<err>
<b>AT+SQNSL?</b>	+SQNSL: <connId1><CR><LF> ... [+SQNSL: <connIdN>]
<b>AT+SQNSL=?</b>	+SQNSL: (1-6), (0-1), (0-65535), (0,255)

### 12.7.2 Description

This command opens/closes a socket listening for an incoming TCP connection on a specified port.

If successful, commands returns a final result code OK. Then, when there is an incoming connection on the local port, unsolicited result code +SQNSRING: <connId> is received.

Afterwards user can use [Socket Accept: +SQNSA](#) to accept the connection or [Socket Shutdown: +SQNSH](#) to reject that incoming connection. <listenPort> is optional when closing the socket.

If the ListenAutoRsp flag from +SQNSCFGEXT command has been set, then, when a TCP connection request comes on the input port, the connection is automatically accepted: the CONNECT indication is given and the modem goes into 'online data mode'.

If the socket is closed by the network, then the following URC is received:  
+SQNSH: <connId>.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Read command returns all the actual listening TCP sockets.

Test command returns the range of supported values for all the subparameters.

## 12.7.3 Defined Values

### connId

Socket connection identifier, integer [1-6].

### listenState

Open or close the listening socket, integer [0-1].

**Table 12-14:** *listenState*

Value	Description
0	Close listening socket
1	Open listening socket

### listenPort

Local listening TCP port, Integer [0-65535].

### lingerT

Closure type, optional, integer [0,255].

**Table 12-15:** *lingerT*

Value	Description
0	Default value. Immediate closure after remote closure
255	Socket is closed after an escape sequence (+++) or after remote closure

## 12.7.4 Example

```
at+sqnsl=?
+SQNSL: (1-6), (0-1), (0-65535) [, (0, 255)]
OK
```

```
at+sqnsl?
OK
```

```
at+sqnsl=1,1,99
OK
```

```
at+sqnsl=2,1,555
OK
```

```
at+sqnsl?
+SQNSL: 1
+SQNSL: 2
OK
```

## 12.8 Socket Listen UDP: +SQNSLUDP

### 12.8.1 Syntax

Command	Possible Response(s)
<b>AT+SQNSLUDP</b> =<connId>,<listenState>[,<listenPort>]	OK ERROR +CME ERROR:<err>
<b>AT+SQNSLUDP?</b>	+SQNSLUDP:<connId1> ... +SQNSLUDP:<connIdN> OK
<b>AT+SQNSLUDP=?</b>	+SQNSLUDP: (1-6), (0-1), (0-65535)

### 12.8.2 Description

This command opens/closes a socket listening for an incoming UDP connection on a specified port.

If successful, commands returns a final result code OK. Then, when there is an incoming connection on the local port, unsolicited result code +SQNSRING:<connId> is received.

Afterwards user can use +SQNSA to accept the connection or +SQNSH to refuse it. <listenPort> is optional when closing the socket.

If the socket is closed by the network the following unsolicited result code is received +SQNSLUDP: ABORTED.

Read command returns all the actual listening sockets.

Test command returns values supported as a compound value.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

## 12.8.3 Defined Values

### connId

Socket connection identifier, integer [1-6].

### listenState

Open or close the listening socket, integer [0-1].

**Table 12-16:** *listenState*

Value	Description
0	Close listening socket
1	Open listening socket

### listenPort

Listening UDP port, Integer [0-65535].

## 12.8.4 Example

```
at+sqnsludp=?
+SQNSLUDP: (1-6), (0-1), (0-65535)
OK

at+sqnsludp?
OK

at+sqnsludp=1,1,456
OK

at+sqnsludp?
+SQNSLUDP: 1
OK
```

## 12.9 Socket Restore: +SQNSO

### 12.9.1 Syntax

Command	Possible Response(s)
AT+SQNSO=<connId>	Possible intermediate response: CONNECT OK ERROR NO CARRIER +CME ERROR:<err>
AT+SQNSO=?	+SQNSO: (1-6) OK

### 12.9.2 Description

This command resumes the socket connection which has been suspended by the escape sequence.

---

**Note:** After the CONNECT, you can suspend the socket connection (the socket remaining open) using the escape sequence (+++). The device re-enters 'command mode' and you will receive the final result code OK after the suspension.

---

### 12.9.3 Defined Values

**connId**

Integer in range [1-6]. Socket connection identifier.

### 12.9.4 Example

```
at+sqnso=?  
+SQNSO: (1-6)  
OK
```

```
at+sqnso=1  
CONNECT
```

## 12.10 Receive Data in Command Mode: +SQNSRECV

### 12.10.1 Syntax

Command	Possible Response(s)
AT+SQNSRECV=<connId>,<maxByte>	+SQNSRECV:<connId>,<maxByte><CR><LF><data> OK ERROR +CME ERROR:<err>
AT+SQNSRECV=?	+SQNSRECV:(1-6), (1-1500) OK

### 12.10.2 Description

This command reads data arrived through a connected socket, buffered and not yet read because the module entered 'command mode' before reading them. The module is notified of these data by a SQNSRING URC, whose presentation format depends on the last +SQNSCFGEXT setting.

---

**Note:** Issuing AT+SQNSRECV when there's no buffered data raises an error.

---

### 12.10.3 Defined Values

**connId**

Integer in range [1-6]. Socket connection identifier.

**cid**

Integer in range [1-1500]. Maximum number of bytes to read.

## 12.10.4 Example

```
at+sqnsrecv=?  
+SQNSRECV: (1-6), (1-1500)  
OK
```

```
at+sqnsrecv=1,5  
+SQNSRECV: 1,5  
hello+OK
```

## 12.11 Socket Activity Notification: +SQNSRING

### 12.11.1 Syntax

	Unsolicited Response(s)
	<ul style="list-style-type: none"> <li>When AT+SQNSCFGEXT parameter &lt;srMode&gt; is set to 0 (default), or for an incoming TCP connection: +SQNSRING:&lt;connId&gt;</li> <li>When AT+SQNSCFGEXT parameter &lt;srMode&gt; is set to 1: +SQNSRING:&lt;connId&gt;,&lt;recData&gt;</li> <li>When AT+SQNSCFGEXT parameter &lt;srMode&gt; is set to 2: +SQNSRING:&lt;connId&gt;,&lt;recData&gt;,&lt;data&gt;</li> </ul>

### 12.11.2 Description

Unsolicited response that can be received while being in 'command mode' only. It can notify of data arrival, more or less detailed (see syntax), and of an incoming TCP connection if a listening socket has been started before with +SQNSL command.

**Note:**

- After data arrival notification, received bytes are flushed only by explicit read through +SQNSRECV command.
- Internal buffering is limited and +SQNSRING notification will stop until host starts reading data through +SQNSRECV command. URC will be sent again if enough data has been read and if there are still new data arrival to notify.



## 12.11.3 Defined Values

### **connId**

Integer in range [1-6]. Socket connection identifier.

### **recData**

Integer in range [1-1500]. Maximum number of bytes to read.

### **data**

Data to read.

## 12.11.4 Example

```
at+sqnscfgext=1,0, 0,0,0,0,0,0
OK
(...)
+SQNSRING: 1
+SQNSRING : 1
+SQNSRING: 1
+SQNSRING: 1
+SQNSRING: 1

at+sqnscfgext=2,1,0,0,0,0,0,0
OK
(...)
+SQNSRING: 2,1500

at+sqn scf gext=3,2,0,0,0,0,0,0
OK(...)
+SQNSRING: 3,264,fdkkkkkkkkkkkkkkmoSDQFfdd...
+SQNSRING: 3,264,fgiojnerogijoiopfdsqpioiop...
+SQNSRING: 3,168,gGgGgGgGgGgGgGgGgGgGgGgGgGgGgU...
at+sqnsl?
+SQNSL: 4
OK
+SQNSRING: 4
```

## 12.12 Socket Status : +SQNSS

### 12.12.1 Syntax

Command	Possible Response(s)
AT+SQNSS	+SQNSS : <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1><CR><LF> ... +SQNSS : <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6><CR><LF> OK
AT+SQNSS?	+SQNSS : <connId1>,<state1>,<locIP1>,<locPort1>,<remIP1>,<remPort1><CR><LF> ... +SQNSS : <connId6>,<state6>,<locIP6>,<locPort6>,<remIP6>,<remPort6><CR><LF> OK
AT+SQNSS=?	OK

**Note:** If a channel is closed (<state> value 0), then <locIP>, <locPort>, <remIP> and <remPort> parameters are omitted.

### 12.12.2 Description

This command reports the current status of the sockets.

### 12.12.3 Defined Values

**connId**

Integer in range [1-6]. Socket connection identifier.

**state**

Integer in range [0-6]. Current state of the socket.

**Table 12-17:** *state*

Value	Description
0	Socket Closed.
1	Socket with an active data transfer connection.

**Table 12-17:** *state* (Continued)

Value	Description
2	Socket suspended.
3	Socket suspended with pending data.
4	Socket listening.
5	Socket with an incoming connection. Waiting for the user accept or shutdown command.
6	Socket in opening process. The socket is not in Closed state but still not in Active or Suspended or Suspended with pending data state.

**locIP**

IP address associated by the context activation to the socket.

**locPort**

One of the following:

- The listening port if the socket is in listen mode.
- The local port for the connection if the socket is connected to a remote machine.

**remIP**

Remote IP address when the device is connected to a remote machine.

**remPort**

Connected port on the remote machine.

## 12.12.4 Example

```
at+sqnss
+SQNSS: 1,2,192.168.6.8,36419,65.52.116.180,80
+SQNSS: 2,4,0.0.0.0,888,,0
+SQNSS: 3,0
+SQNSS: 4,5,192.168.9.2,999,10.10.10.6,45133
+SQNSS: 5,3,192.168.6.2,57037,10.10.10.4,7
+SQNSS: 6,0
```

```
at+sqnss?
+SQNSS: 1,0
+SQNSS: 2,0
+SQNSS: 3,0
+SQNSS: 4,0
+SQNSS: 5,0
+SQNSS: 6,0
OK
```

```
at+sqnss=?
OK
```

## 12.13 Secure Socket Configuration: +SQNSSCFG

### 12.13.1 Syntax

Command	Possible Response(s)
AT+SQNSSCFG=<connId>,<enable>,<spId>	+SQNSSCFG:<connId>,<enable>,<spId> +CME ERROR:<err> OK
AT+SQNSSCFG?	+SQNSSCFG: 1 , <enable1> , <spId1> <CR> <LF> ... +SQNSSCFG: 6 <enable6> , <spId6> OK
AT+SQNSSCFG=?	+SQNSSCFG: ( 1 - 6 ) , ( 0 - 1 ) , ( 1 - 6 ) OK

### 12.13.2 Description

This command enables or disables the use of SSL/TLS connection on a TCP or UDP socket.

The configuration of the SSL/TLS properties is provided with an SSL/TLS profile managed by AT+SQNSPCFG.

The <spId> parameter is listed in the information text response to the read command only if the SSL/TLS is enabled on the interested socket.

Notes:

1. SSL/TLS configuration is available for both TCP and UDP sockets.
2. SSL/TLS is not supported for socket configured in listen mode (AT+SQNSL command).
3. The enable/disable and security profile change operations should be performed while socket is not active (socket dial with AT+SQNSD command).
4. Any security configuration change attempt on an active socket will rise an error.
5. After security activation, any attempt to create a socket in listen mode (AT+SQNSL, AT+SQNSLUDF) will rise an error.

## 12.13.3 Defined Values

### spId

Integer in range [1-6]. Security profile identifier. See AT+SQNSPCFG for security profile details.

### connId

Integer in range [1-6]. Socket connection identifier.

### enable

Integer in range [0-1]. Security enable status.

**Table 12-18:** *state*

Value	Description
0	Deactivate secure socket (default value).
1	Activate SSL/TLS on the socket.

## 12.13.4 Example

- Write configuration:
 

```
AT+SQNSSCFG=1,1,1
OK
```
- Read configurations:
 

```
AT+SQNSSCFG
+SQNSSCFG: 1,1,1
+SQNSSCFG: 2,0,1
+SQNSSCFG: 3,0,1
+SQNSSCFG: 4,0,1
+SQNSSCFG: 5,0,1
+SQNSSCFG: 6,0,1
OK
```
- Test command:
 

```
AT+SQNSSCFG=?
Possible response(s):
+SQNSSCFG: (1-6), (0-1), (1-6)
OK
```

## 12.14 Send Data in Command Mode: +SQNSSEND

### 12.14.1 Syntax

Command	Possible Response(s)
AT+SQNSSEND=<connId>	Intermediate result code: > OK ERROR NO CARRIER +CME ERROR:<err>
AT+SQNSSEND=?	+SQNSSEND: (1-6) OK

### 12.14.2 Description

This command, while the module is in command mode, sends data through a connected socket.

To complete the operation, send Ctrl-Z char (0x1A in hexadecimal). To exit without sending the message, send ESC char (0x1B in hexadecimal).

If data is successfully sent, then the response is OK. If data sending fails for some reason, then an error code is reported.

Notes:

1. The maximum number of bytes to send is 1500.
2. It is possible to use +SQNSSEND only if the connection was opened by +SQNSD, else the UE will raise an error.
3. A byte corresponding to BS character (0x08) is processed with its corresponding meaning (back space). Therefore, the previous byte will be cancelled and the BS character itself will not be sent.

## 12.14.3 Defined Values

### **connId**

Integer in range [1-6]. Socket connection identifier.

## 12.14.4 Example

```
at+sqnssend=?  
+SQNSSEND: (1-6)  
OK
```

```
at+sqnssend=1  
>hello  
OK
```



## 12.15 Extended Send Data In Command Mode: +SQNSSENDEXT

### 12.15.1 Syntax

Command	Possible Response(s)
AT+SQNSSENDEXT=<con nId>,<bytesToSend>	Intermediate result code: > OK ERROR NO CARRIER +CME ERROR:<err>
AT+SQNSSENDEXT=?	+SQNSSENDEXT: (1-6), (1-1500) OK

### 12.15.2 Description

This command allows, while the module is in command mode, to send data through a connected socket including all possible octets (from 0x00 to 0xFF).

The device responds to the command with the prompt '>' (<greater\_than> sign and <space> character) and waits for the data to send.

When <bytetosend> bytes have been sent, then the operation is automatically completed.

If data is successfully sent, then the response is OK. If data sending fails for some reason, then an error code is reported.

---

**Note:** Input data format is raw binary by default. It is configurable using AT+SQNSCFGEXT command.

---

Notes:

1. The maximum number of bytes to send is 1500.
2. It is possible to use +SQNSSENDEXT only if the connection was opened by +SQNSD, else the UE will raise an error.
3. All special characters are sent like generic bytes. A byte corresponding to BS character (0x08) is sent through the socket and doesn't behave like a back space. Therefore, the previous byte will not be deleted.

## 12.15.3 Defined Values

**connId**

Integer in range [1-6]. Socket connection identifier.

**bytesToSend**

Integer in range [1-1500]. Number of bytes to send.

## 12.15.4 Example

```
at+sqnssendext=?  
+SQNSSENDEXT: (1-6), (1-1500)  
OK
```

```
at+sqnssendext=1,11  
>hello again
```

# 13

## Sequans Specific HTTP Commands

### 13.1 HTTP Configure: +SQNHTTPCFG

#### 13.1.1 Syntax

Command	Possible Response(s)
<code>AT+SQNHTTPCFG=&lt;prof_id&gt;[,&lt;server_address&gt;[,&lt;server_port&gt;[,&lt;auth_type&gt;[,&lt;username&gt;[,&lt;password&gt;[,&lt;ssl_enabled&gt;[,&lt;timeout&gt;[,&lt;cid&gt;[,&lt;spId&gt;]]]]]]]]]</code>	+CME ERROR:<err>
<code>AT+SQNHTTPCFG?</code>	+SQNHTTPCFG : <prof_id1>,<server_address1>,<server_port1>,<auth_type1>,<username1>,<password1>,<ssl_enabled1>,<timeout1>,<cid1>,<spId1> ... +SQNHTTPCFG : <prof_idN>,<server_addressN>,<server_portN>,<auth_typeN>,<usernameN>,<passwordN>,<ssl_enabledN>,<timeoutN>,<cidN>,<spIdN> OK
<code>AT+SQNHTTPCFG=?</code>	+SQNHTTPCFG : <prof_id>,<s_length>,<server_port>,<auth_type>,<u_length>,<p_length>,<ssl_enabled>,<timeout>,<cid>,<spId> OK

#### 13.1.2 Description

This command sets the parameters needed to the HTTP connection.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Read command returns the current settings for each defined profile.

Test command returns the range of supported values/lengths for all the subparameters.

---

**Note:** A special form of the Set command, +SQNHTTPCFG=<prof\_id>, causes the values for profile number <prof\_id> to reset to default values.

---

Parameters of +SQNHTTPCFG are automatically saved to NVM. They are persistent after reboot.

### 13.1.3 Defined Values

#### prof\_id

Integer in range [0-2]. Numeric parameter indicating the profile identifier.

#### server\_address

String. IP address of the HTTP server.

This parameter can be either

- Any valid IP address in the format: "xxx.xxx.xxx.xxx"
- Any host name to be solved with a DNS query

Default is "".

#### server\_port

Integer in range [1-65535]. Numeric parameter indicating the TCP remote port of the HTTP server to connect to.

Default values are 80 for the first, second and third profiles.

#### auth\_type

Integer in range [0-1]. Numeric parameter indicating the HTTP authentication type.

**Table 13-1:** *auth\_type*

Value	Description
0	(Default) No authentication
1	Basic authentication

#### username

String. Authentication user identification string for HTTP. This parameter is empty by default.

**password**

String. Authentication password for HTTP. This parameter is empty by default.

**ssl\_enabled**

Integer in range [0-1]. Indicates if the SSL encryption is enabled.

**Table 13-2:** *ssl\_enabled*

Value	Description
0	(Default) SSL encryption disabled
1	SSL encryption is enabled

**timeout**

Integer in range [1-120]. Time interval in seconds to wait for receiving data from HTTP server. Default: 120.

**cid**

Integer in range [1-8]. PDN Context Identifier. Default: 3.

**spId**

Integer in range [1-6]. Security Profile identifier to be used for HTTPS request if <ssl\_enabled>=1. Default: 1.

**s\_length**

Integer. Maximum length of parameter <server\_address>.

**u\_length**

Integer. Maximum length of parameter <username>.

**p\_length**

Integer. Maximum length of parameter <password>.

## 13.2 HTTP Query: +SQNHTTPQRY

### 13.2.1 Syntax

Command	Possible Response(s)
<code>AT+SQNHTTPQRY=&lt;prof_id&gt;,&lt;command&gt;,&lt;resource&gt;[,&lt;extra_header_line&gt;]</code>	+CME ERROR:<err>
<code>AT+SQNHTTPQRY=?</code>	+SQNHTTPQRY:<prof_id>,<command>,<r_length>,<m_length> OK

### 13.2.2 Description

This command performs HTTP GET, HEAD or DELETE request to server.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Test command returns the range of supported values/lengths for all the subparameters.

When an answer from HTTP server is received, the +SQNHTTPRING URC is shown.

## 13.2.3 Defined Values

### **prof\_id**

Integer in range [0-2]. Numeric parameter indicating the profile identifier.

### **command**

Integer in range [0-2]. Command requested to HTTP server.

**Table 13-3:** *command*

Value	Description
0	GET
1	HEAD
2	DELETE

### **resource**

String. HTTP resource (uri), object of the request.

### **extra\_header\_line**

String. Optional HTTP header line.

---

**Note:** If sending ends successfully, the response is OK; otherwise an error code is reported.  
The HTTP request header sent with +SQNHTTPQRY always contains the "Connection: close" line which can't be removed.

---

### **content\_type**

String. "Content-Type" header line, as received from the server (see RFC 2616)

### **data\_size**

Integer. Amount of data (in byte) received from the server.

If the server doesn't report the "Content-Length:" header line, the parameter value is 0.

---

**Note:** Note: if there are no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of +SQNHTTPCFGcommand, then the URC +SQNHTTPRING <http\_status\_code> parameter has value 0.

---

### **http\_status\_code**

Integer. Status code, as received from the server (see RFC 2616).

**r\_length**

This value is used only in test command AT+SQNHTTPQRY=?.

Maximum length of of parameter <resource>, integer.

**m\_length**

This value is used only in test command AT+SQNHTTPQRY=?.

Maximum length of of parameter <extra\_header\_line>, integer.



## 13.3 HTTP Receive: +SQNHTTPCRV

### 13.3.1 Syntax

Command	Possible Response(s)
<code>AT+SQNHTTPCRV=&lt;prof_id&gt;[,&lt;maxbytes&gt;]</code>	+CME ERROR:<err>
<code>AT+SQNHTTPCRV=?</code>	+SQNHTTPCRV:<prof_id>,<max_bytes> OK

### 13.3.2 Description

This command is used to read the body of HTTP response. It can be used after receiving of [HTTP Response URC: +SQNHTTPRING](#)

Set command permits the user to read data from HTTP server in response to a previous HTTP module request. The module is notified of these data by the +SQNHTTPRING URC. The device shall prompt a three character sequence <<< (<less\_than><less\_than><less\_than> (IRA 60, 60, 60)) followed by the data. If reading ends successfully, the response is OK; otherwise an error code is reported.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Test command returns values supported as a compound value.

### 13.3.3 Defined Values

**prof\_id**

Integer in range [0-2]. Numeric parameter indicating the profile identifier.

**max\_bytes**

Integer. Max number of bytes to read at a time, range is [0,64-1500]. Default: 0, which means infinite size.

---

**Note:** If <max\_byte> is unspecified, server data will be transferred all in once. If the data are not present or if the +SQNHTTPRING <http\_status\_code> parameter has value 0, then an error code is reported.

---

**http\_status\_code**

Integer. Status code, as received from the server (see RFC 2616).

### 13.3.4 Examples

- Setting www.w3.org as remote server.  

```
AT+SQNHTTPCFG=1, "www.w3.org"
OK
```
- Perform HTTP GET request to "/Summary.html" page.  

```
AT+SQNHTTPQRY=1, 0, "/Summary.html"
OK
```
- +SQNHTTPRING URC is shown. Status code is 200 (OK), content type has an extension and content-length is 5223 bytes.  

```
+SQNHTTPRING: 1,200,"text/html; charset=iso-8859-1",5223
```
- Perform infinite reading of server's response.  

```
AT+SQNHTTPRCV=1
<<<<HTML>
<HEAD>
... output omitted ...
</ADDRESS></BODY>
</HTML>

OK
```

## 13.4 HTTP Response URC: +SQNHTTPRING

### 13.4.1 Syntax

Command	Possible Response(s)
	+SQNHTTPRING:<prof_id>,<http_status_code>,<content_type>,<data_size>

### 13.4.2 Description

This URC is shown when an answer from HTTP server is received.

### 13.4.3 Defined Values

**prof\_id**

HTTP profile identifier, integer [0-2].

**http\_status\_code**

HTTP status code, as received from the server, 3-digit integer.

**content\_type**

"Content-Type" header line, as received from the server, string.

**data\_size**

"Content-Length:" header line, as received from the server.

---

**Note:** If server doesn't answer within the time interval specified in <timeout> parameter of +SQNHTTPCFG command, then the <http\_status\_code> parameter has value 0, <content\_type> parameter is empty and <data\_size> parameter has value 0. If "Content-Length" header line is absent in the response from server, then <data\_size> parameter has value 0.

---

## 13.5 HTTP Send: +SQNHTTSPND

### 13.5.1 Syntax

Command	Possible Response(s)
<b>AT+SQNHTTSPND</b> =<prof_id>,<command>,<resource>,<data_len>[,<post_param>[,<extra_header_line>]]	+CME ERROR:<err>
<b>AT+SQNHTTSPND</b> =?	+SQNHTTSPND:<prof_id>,<command>,<r_length>,<data_len>,<p_length>,<m_length> OK

### 13.5.2 Description

Set command performs a POST or PUT request to HTTP server and starts sending data to the server. The device shall prompt a three character sequence >>> (<greater\_than><greater\_than><greater\_than> (IRA 62, 62, 62)) after command line is terminated with <CR>; after that the data can be entered from TE, sized <data\_len> bytes. When the HTTP server answer is received, then the following URC (when supported) is put on the serial port:  
 +SQNHTTSPRING: <prof\_id>,<http\_status\_code>,<content\_type>,<data\_size>.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

Test command returns values supported as a compound value.

### 13.5.3 Defined Values

**prof\_id**

Integer in range [0-2]. Numeric parameter indicating the profile identifier.

**command**

Integer in range [0-1]. Command requested to HTTP server:

**Table 13-4:** *command*

Value	Description
0	POST
1	PUT

**resource**

String. HTTP resource (uri), object of the request

**data\_len**

Integer. Length of input data in bytes.

**post\_param**

String. HTTP Content-Type identifier.

Used only for POST command, optionally followed by colon character (:) and a string that extends with sub-types the identifier. Other content-free string corresponding to other content type and possible sub-types.

**Table 13-5:** *post\_param*

Value	Description
0[:extension]	“application/x-www-form-urlencoded” with optional extension
1[:extension]	“text/plain” with optional extension
2[:extension]	“application/octet-stream” with optional extension
3[:extension]	“multipart/form-data” with optional extension

**extra\_header\_line**

String. Optional HTTP header line.

---

**Note:** If sending ends successfully, the response is OK; otherwise an error code is reported.  
The HTTP request header sent with +SQNHTTTPQRY always contains the “Connection: close” line which can’t be removed.

---

**content\_type**

String. “Content-Type” header line, as received from the server (see RFC 2616)

**data\_size**

Integer. Amount of data (in byte) received from the server.

If the server doesn't report the "Content-Length:" header line, the parameter value is 0.

---

**Note:** Note: if there are no data from server or the server doesn't answer within the time interval specified in <timeout> parameter of +SQNHTTPCFGcommand, then the URC +SQNHTTTPRING <http\_status\_code> parameter has value 0.

---

**r\_length**

Integer, Maximum length of of parameter <resource>.

**p\_length**

Integer. Maximum length of of parameter <post\_param>.

**m\_length**

Integer. Maximum length of of parameter <extra\_header\_line>.

## 13.5.4 Example

- Post 100 byte without "Content-type" header
 

```
AT+SQNHTTPSND=0,0,"/",100
>>>
```
- Post 100 byte with "application/x-www-form-urlencoded"
 

```
AT+SQNHTTPSND=0,0,"/",100,0
>>>
```
- Post 100 byte with "multipart/form-data" and extension
 

```
AT+SQNHTTPSND=0,0,"/",100,"3:boundary=----FormBoundary"
>>>
```

---

# 14 Sequans Non-Volatile Memory Commands

## 14.1 Non Volatile Data Decrypt: +SQNSDECRYPT

### 14.1.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSDECRYPT=&lt;algoType&gt;,&lt;spId&gt;,&lt;dataLen&gt;,&lt;isBase64In&gt;,&lt;isBase64Out&gt;,&lt;isBase64IV&gt;,&lt;initVector&gt;</code>	<code>+SQNSDECRYPT:&lt;size&gt;</code> <code>&lt;&lt;&lt;&lt;data&gt;</code> OK ERROR <code>+CME ERROR:&lt;err&gt;</code>
<code>AT+SQNSDECRYPT?</code>	OK
<code>AT+SQNSDECRYPT=?</code>	<code>SQNSDECRYPT:(0..6),(0..1),(&lt;size&gt;),(0..1),(0..1),(0..1),"</code> OK

### 14.1.2 Description

This command allows to decrypt AES (only AES for now) encoded data. Data are preceding with "<<<" delimiter.

## 14.1.3 Defined Values

### **algoType**

Type of encryption algorithm, enum - integer or string. "AES" or 0.

### **spId**

Security Profile identifier, integer [0-6]. Look to AT+SQNSPCFG.

### **dataLen**

Length of encrypted data, integer.

### **isBase64In**

Optional. Is input data Base64 encoded or not, integer [0-1], default 0.

### **isBase64Out**

Optional. Is output data Base64 encoded or not, integer [0-1], default 0.

### **isBase64IV**

Optional. Is initialization vector Base64 encoded or not, integer [0-1], default 0

### **initVector**

Optional. Initialization vector, string. Maybe raw string or Base64 encoded depending on <isBase64> param.

### **size**

Size of decrypted data, integer.

## 14.1.4 Usage Example

Encrypt AES-encrypted "Hi there!" string:

```
AT+SQNSPCFG=1,2,"0x8C;0x8D;0xAE;0xAF",,,,,,"CC362389DB79D7788C3FA97572C8AD0851F2EB73E8DCC49391557ABB18C070D0"
```

OK

```
AT+SQNSDECRYPT=0,1,24,1,1,0,"hellohellohelloh"
```

```
> 1/yMF1yNirYXRE+el+ybgA==
+SQNSDECRYPT: 24
<<<SGkgdGhlcmUhcG9YGBgYGBg==
OK
```



## 14.2 Read Data in NVM: +SQNSNVR

### 14.2.1 Syntax

Command	Possible Response(s)
AT+SQNSNVR="certificate",<index>,<size><CR><LF><data>	+SQNSNVR:<type>...<type>... [...]]<CR><LF>+SQNSNVR: <type>...[...]] OK
AT+SQNSNVR="privatekey"[,<index>]	+SQNSNVR:<index>, "-----BEGIN RSA PRIVATE KEY-----<CR><LF> "<8 first bytes> [...] <8 last bytes>" "-----END RSA PRIVATE KEY----- [<CR><LF> +SQNSNVR:<index>, "-----BEGIN RSA PRIVATE KEY-----<CR><LF>"<8 first bytes> [...] <8 last bytes>" "-----END RSA PRIVATE KEY-----[...]] OK
AT+SQNSNVR?	OK
AT+SQNSNVR=?	+SQNSNVR: "certificate" , (list of supported <index>) +SQNSNVR: "privatekey" , (list of supported <index>) OK

### 14.2.2 Description

---

**Note:** The commands +SQNSNVR and +SQNSNVW allow reading and writing data (certificate, private key) from/to the non-volatile (NV) memory or from/to the Flash File System. Data stores in Non-Volatile Memory will be persistent against device reboot and software upgrade.

---

This command allows to read data (certificate, private key) stored in the non-volatile (NV) memory or the Flash File System.

Read command usage and syntax vary depending on the type of stored data.

AT+SQNSNVR="certificate" [, <index>]

This command with "certificate" type should be used to dump all certificate stored in the system.

If <index> is provided, only certificate with given <index> is displayed. An ERROR is reported in case this entry is empty.

If <index> is not provided, then all available certificates are displayed, one per line.

```
AT+SQNSNVR="privatekey"
```

This command with "privatekey" type should be used to dump all the private keys stored in the system. Only the first 8 bytes and the last 8 bytes of the private key are displayed, separated by [ . . . ] characters.

## 14.2.3 Defined Values

### **type**

Type of data, string.

"certificate": Certificate data.

"privatekey": Private key.

### **index**

Certificate index, integer [0-19].

### **issuer**

Certificate issuer (Entity that verified the information and issued the certificate), string.

### **serial-number**

Certificate serial number (used to uniquely identify the certificate), string.

### **subject**

Certificate subject (person or entity identified), string.

### **valid-from**

Certificate validity period start, string.

### **valid-to**

Certificate expiration date, string.

### **signature-algorithm**

Certificate signature algorithm (Algorithm used to create the signature), string.

### **signature**

Certificate signature (Actual signature to verify that it came from the issuer), string.

### thumbprint-algorithm

Certificate thumbprint algorithm (algorithm used to hash the public key certificate), string.

### thumbprint

Certificate thumbprint (The hash itself, used as an abbreviated form of the public key certificate), string.

## 14.2.4 Example

- Read certificate @ index 5

```
AT+SQNSNVR="certificate",5
+SQNSNVR:
"certificate",5,<issuer>,<serial-number>,<subject>,<valid-from>,<
valid-to>,<signature-algorithm>,<signature>,<thumbprint-algorithm
>,<thumbprint>
OK
```

- Read all certificates:

---

**Note:** All certificate data is not displayed in the example below. Shortened sections are identified by “(...)”.

---

```
AT+SQNSNVR="certificate"
+SQNSNVR: "certificate",0,"/C=US/O=VeriSign, Inc./OU=VeriSign
Trust Network/OU=(c) 2006 VeriSign, Inc. - For authorized use
only/CN=VeriSign Class 3 Public Primary Certification Authority -
G5","0000(...)00000","/C=US/O=VeriSign, Inc./OU=VeriSign Trust
Network/OU=(c) 2006 VeriSign, Inc. - For authorized use
only/CN=VeriSign Class 3 Public Primary Certification Authority -
G5","06/11/08 00:00:00","36/07/16
23:59:59","sha1RSA","0000(...)0000","sha1","b054ec81256dc47f1f036
0e38fe30d6ccba35424"
+SQNSNVR: "certificate",1,"/OU=Amazon Web Services O=Amazon.com
Inc. L=Seattle ST=Washington
C=US","0000000(...)0000000000","/CN=AWS IoT
Certificate","18/01/03 07:06:00","49/12/31
23:59:59","sha256RSA","000000(...)0000","sha1","f6bb69bdc40afedb8
40e6854749db37c74501e6b"
OK
```

- read a single private key:

```
AT+SQNSNVR="privatekey",2
+SQNSNVR: 1,"-----BEGIN RSA PRIVATE KEY-----
MIIFQTCC [...] 4PsJYGw=
-----END RSA PRIVATE KEY-----
```

## 14.3 Write Data in NVM: +SQNSNVW

### 14.3.1 Syntax

Command	Possible Response(s)
AT+SQNSNVW=<type>,...	OK
AT+SQNSNVW="certificate",<index>,<size><CR><LF><data>	
AT+SQNSNVW="privatekey",<index>,<size><CR><LF><data>	
AT+SQNSNVW?	OK
AT+SQNSNVW=?	+SQNSNVW: "certificate" , (list of supported <index>),(list of supported <size>) OK

### 14.3.2 Description

**Note:** The commands +SQNSNVR and +SQNSNVW allow reading and writing data (Certificate, etc.) from/to the non-volatile (NV) memory or from/to the Flash File System. Data stores in Non-Volatile Memory will be persistent against device reboot and software upgrade.

This command allows to write/delete data (Certificate, etc.) to/from the non-volatile (NV) memory.

Write command usage & syntax may change depending on the type of data to store.

AT+SQNSNVW="certificate" , <index> , <size><CR><LF><data>

This write command with "certificate" type should be used to write certificate in non volatile memory. After upload, public certificates are immediately available for all client secured IP connection (+SQNSUPGRADE, Secured socket). For secured socket in server mode, certificate <index> should be used to assign private certificate to secure server.

An <index> should be provided and will be used by the system to identify in a unique way the certificate for future operations (delete, etc.)

<size> parameter corresponds to the exact number of bytes of the certificate to upload: after AT+SQNSNVW write command issued, user should send certificate bytes in PEM (Privacy-enhanced Electronic Mail) format. As soon as <size> bytes have been received, operation is automatically completed. If certificate is successfully uploaded and verified, then the response is OK. If certification upload fails for some reason, then an error code is reported.

To delete a certificate, one should simply write a 0 byte certificate using certification ID as <index>.

```
AT+SQNSNVW="privatekey", <index>, <size><CR><LF><data>
```

This write command with "privatekey" type will write a private key in PEM format to the non-volatile memory.

---

**Note:** Private RSA keys with password are not supported.

---

**Note:** The MQTT broker may provide certificates and private keys files with CRLF (carriage return and line feed) line-ending. But the <size> of the certificate or the private key must be a size of the appropriate file after removing CR (carriage return) from it. To remove CR (carriage return) use the following command on Linux:

```
tr -d \015 < file_with_cr > no_cr_file
```

---

### 14.3.3 Defined Values

**type**

Type of data, string.

"certificate": Certificate data.

"privatekey": Private key.

**index**

Certificate index, integer [0-19].

**size**

Size in bytes of certificate file to upload or `0` to remove, integer.

## 14.3.4 Example

- Certificate upload @ index 5:
 

```
AT+SQNSNVW="certificate",5,1346
-----BEGIN CERTIFICATE-----
MIIDXTCCAkWgAwIBAgIJAJC1HiIAZAiIMA0GCSqGSIb3DfBAYTAKFVMRMwEQYDVQQ
IDApTb211LVN0YXRlMSEwHwYDVx [...] C3Fayua4DRHyZOLmlvQ6tIChY0ClXXuefbm
VSDeUHwc8YuB7xxt8BVc69rLeHV15A0qyx77CLSj3tCx2IUXVqRs5mlSbvA==
-----END CERTIFICATE-----
OK
```
- Remove certificate @ index 5:
 

```
AT+SQNSNVW="certificate",5,0
OK
```
- Upload client private key with keyid 2:
 

```
$ at+sqnsnvw="privatekey",2,1675
> -----BEGIN RSA PRIVATE KEY-----
...
-----END RSA PRIVATE KEY-----
OK
```

---

# 15 System Upgrade Related Commands

## 15.1 Device Reset to Factory State: +SQNS-FACTORYRESET

### 15.1.1 Syntax

Command	Possible Response(s)
AT+SQNSFACTORYRESET	+CME ERROR:<err>
AT+SQNSFACTORYRESET=?	OK

### 15.1.2 Description

Set command causes device to reset to factory state. A device reboot is necessary to finalize the reset to factory state.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

## 15.2 Device Upgrade: +SQNSUPGRADE

### 15.2.1 Syntax

Command	Possible Response(s)
<code>AT+SQNSUPGRADE=&lt;firmware_url&gt;,[&lt;reboot&gt;],[&lt;report_progress&gt;],[&lt;command&gt;]]</code>	+CME ERROR:<err>
<code>AT+SQNSUPGRADE?</code>	SQNSUPGRADE:<upgrade_state>[,...]
<code>AT+SQNSUPGRADE=?</code>	SQNSUPGRADE:(max string length of<firmware_url>),(list of supported <reboot>s),(range of supported <report_progress>),(list of supported <command>s)

### 15.2.2 Description

The write command used to trigger device upgrade with a firmware located either in the device filesystem or fetched from an external server.

The parameters <reboot>, <report\_progress> and <command> are optional. A device reboot is necessary to finalize the system upgrade. Any kind of reboot is acceptable (AT^RESET, AT+SQNSSHDN, hardware reset). <reboot> parameter controls automatic reboot after download firmware has been validated and installed. Upgrade can be launched in foreground or background as specified by <command> value. User can cancel upgrade by sending cancel <command> any time before device reboot. An unsolicited result code +SQNSUPGRADE: "installed" is generated as soon as firmware download is complete and verified, stating device is ready for reboot. <report\_progress> controls presentation of unsolicited result code +SQNSUPGRADE: "downloading".

The write command is also used in case of manual network initiated firmware upgrade, to control firmware upgrade operation timings: the user calls this command to trigger the firmware upgrade and/or to cancel the operation.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

The read command returns the status of result code presentation corresponding to the current state of upgrade process.

Test command returns values supported as a compound value.



## 15.2.3 Defined Values

### **firmware\_url**

String. URL (compliant with RFC1738) of the firmware (protocol://user:password@host:port/path).

An example is:

- `https://sqn:pass@www.sequans.com/private/firmware.sfp` for LR4.x software releases
- `https://sqn:pass@www.sequans.com/private/firmware.dup` for LR5.x and LR6.x software releases

### **reboot**

Integer

**Table 15-1:** *reboot*

Value	Description
0	No reboot after the firmware is installed. The user must reboot explicitly the device to take into account the new firmware
1	Default value. Reboot automatically after the firmware is installed

### **report\_progress**

Integer

**Table 15-2:** *report\_progress*

Value	Description
0	Don't report download progress
1..100	report download progress using +SQNSUPGRADE: "downloading" , <percent_downloaded> URC.

### **command**

integer

**Table 15-3:** *command*

Value	Description
0	Default value. Synchronous upgrade.
1	Start asynchronous upgrade. Launch an asynchronous upgrade. The command launches the upgrade and returns immediately -with OK if upgrade is started correctly or CME ERROR (see below for specific error codes). The command report upgrade progress with +SQNSUPGRADE URC.

**Table 15-3:** *command* (Continued)

Value	Description
2	Cancel upgrade. Cancel upgrade if any or do nothing, then returns OK. In case of Network Initiated firmware upgrade, then the network will be notified with upgrade cancel error code.

**upgrade\_state**  
String

**Table 15-4:** *upgrade\_state*

Value	Description
"canceled"	The upgrade has been canceled
"downloading"	Report the downloading progress. This state is followed with <percent_downloaded>. This information is displayed only if <report_progress> has been set different than 0
"idle"	No upgrade is on going
"installed"	The upgraded is installed and will be effective after the next reboot
"available"	A new firmware is available for download (network initiated firmware upgrade use cases only)
"rebooting"	This notification is sent just before the device reboot that finalizes the system upgrade.

**percent\_downloaded**  
Integer. Percentage of image downloaded. Range is 0..100.

## 15.2.4 Example

```
AT+SQNSUPGRADE?  
+SQNSUPGRADE: "idle"  
OK
```

The following error codes may be returned through +CME ERROR. They are also listed in

**Table 15-5:** +SQNSUPGRADE Specific Error Codes

Code	Description
528	Upgrade failed: General error
529	Upgrade failed: Corrupted image.
530	Upgrade failed: Invalid signature
531	Upgrade failed: Network error
532	Upgrade failed: Upgrade already in progress
533	Upgrade cancel failed: No upgrade in progress

## 15.3 Device Upgrade Configuration +SQNSUPGRADECFG

### 15.3.1 Syntax

Command	Possible Response(s)
AT+SQNSUPGRADECFG =<mode>,<report>,<report_progress>	+CME ERROR:<err>
AT+SQNSUPGRADECFG ?	SQNSUPGRADECFG:<mode>,<report>,<report_progress>
AT+SQNSUPGRADECFG =?	SQNSUPGRADECFG:(list of supported <mode>s),(list of supported <report>s),(range of supported <report_progress>)

### 15.3.2 Description

The write command is used to configure the device behavior in case of network-initiated firmware upgrade configuration. This is typically the case for OTADM FOTA. The level of interaction with the user or the external host is configured by the <mode> parameter. Two modes are defined: automatic (default) and manual. The manual mode is currently not available.

In automatic mode, the network-initiated firmware upgrade operates in background of the regular module operation. After the completion of the new firmware download, the module will automatically apply the new firmware and then reboot.

After the reboot, the module will send a status to the upgrade server, with respect to the Over-The-Air firmware upgrade protocol. The user is notified of the upgrade progress (firmware downloading, firmware installed, upgrade canceled, rebooting) by +SQNSUPGRADE unsolicited result codes, as defined by the notification level configuration (<report> and <report\_progress>) parameters.

---

**Attention:** A reboot of the device is necessary to take into account <mode> configuration change. Any kind of reboot (AT^RESET, AT+SQNSSHDN, hardware reset) is acceptable.

---

The read command returns the current configuration.

Test command returns values supported as a compound value.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

### 15.3.3 Defined Values

#### **mode**

Integer

**Table 15-6:** *mode*

Value	Description
0	Default value. Automatic mode. Network initiated firmware upgrade is fully transparent for the user. Note that an unsolicited reboot can happen anytime to complete the upgrade procedure.
1	Manual mode. This mode is currently not supported.

#### **report**

Integer

**Table 15-7:** *report*

Value	Description
0	Default value. Do not report any upgrade status.
1	Activate upgrade status main step reporting (see <upgrade_state> values of +SQNSUPGRADE URC)

#### **report\_progress**

Integer

**Table 15-8:** *report\_progress*

Value	Description
0	Default value. Do not report download progress
1..100	report download progress using +SQNSUPGRADE: "downloading", <percent_downloaded> URC.

---

# 16 Other Specific Commands

## 16.1 Sequans Manufacturing Integrated Circuit ID: +SMICID

### 16.1.1 Syntax

Command	Possible Response(s)
AT+SMICID	+SMICID: 00:<id0> +SMICID: 01:<id1> +SMICID: 02:<id2> OK

### 16.1.2 Description

This command reads the Unique Chip ID, built as a sequence of 17 bytes split in 3 separate IDs. <id0> is 1 byte long, <id1> is 10 bytes long, and <id2> is 6 bytes long. They are displayed as hexadecimal values.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

## 16.1.3 Defined Values

**id0**

One byte hexadecimal.

**id1**

Ten (10) bytes hexadecimal.

**id2**

Six (6) bytes hexadecimal.

## 16.1.4 Example

```
AT+SMICID
+SMICID: 00: ca
+SMICID: 01: 213f7099e10507481800
+SMICID: 02: 1940c4432000
```

## 16.2 Enable Smart Terminal: +SMART

### 16.2.1 Syntax

Command	Possible Response(s)
AT+SMART=[<status>]	OK +CME ERROR:<err>
AT+SMART=?	OK

### 16.2.2 Description

This command switches between the default basic terminal and a user friendly smartterminal on the AT interface.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

### 16.2.3 Defined Values

**status**

Integer. Enable or disable the smart terminal.

**Table 16-1:** *status*

Value	Description
0	Default value. Disable smart terminal.
1	Enable smart terminal



## 16.3 Specific eDRX Settings: +SQNEDRX

### 16.3.1 Syntax

Command	Possible Response(s)
<code>AT+SQNEDRX=&lt;mode&gt;,[&lt;AcT-type&gt;],[&lt;Requested_eDRX_value&gt;],[&lt;Requested_ptw_value&gt;]</code>	+CME ERROR:<err>
<code>AT+SQNEDRX?</code>	+SQNEDRX:<mode>[,<Requested_eDRX_value>,<Requested_ptw_value>]
<code>AT+SQNEDRX=?</code>	+SQNEDRX:(0-3),(4),("0000"- "1111"),("0000"- "1111")

### 16.3.2 Description

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

This command behaves as [eDRX Setting: +CEDRXS](#), returning <mode> on Read command.

## 16.3.3 Defined Values

### mode

Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.

**Table 16-2:** *mode*

Value	Description
0	Disable the use of eDRX
1	Enable the use of eDRX
2	Enable the use of eDRX and enable the unsolicited result code +CEDRXP:<AcT-type> [, <Requested_eDRX_value> [, <NW-provided_eDRX_value> [, <Paging_time_window>]]]
3	Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.

### AcT-type

Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.

**Table 16-3:** *AcT-type*

Value	Description
0	Access technology is not using eDRX. This parameter value is only used in the unsolicited result code.
1	EC-GSM-IoT (A/Gb mode)
2	GSM (A/Gb mode)
3	UTRAN (Iu mode)
4	E-UTRAN (WB-S1 mode)
5	E-UTRAN (NB-S1 mode)

### **Requested\_eDRX\_value**

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.

### **Requested\_ptw\_value**

String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

### **NW-provided\_eDRX\_value**

String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

### **Paging\_time\_window**

String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.

## 16.4 File Download: +SQNFGET

### 16.4.1 Syntax

Command	Possible Response(s)
<code>AT+SQNFGET=&lt;remote_url&gt;,[&lt;sync&gt;],[&lt;local_filename&gt;]</code>	+CME ERROR:<err>
<code>AT+SQNFGET?</code>	+SQNFGET: "started" +SQNFGET: "downloading" +SQNFGET: "error" +SQNFGET: "complete" +SQNFGET: "not running" OK
<code>AT+SQNFGET=?</code>	+SQNFGET:<remote_url>,[<sync>],[<local_filename>] OK

### 16.4.2 Description

This command initiates TFTP/FTP/HTTP connection establishing in order to download specified file.

Read command returns the current state of connection.

Test command returns string, which defines command syntax.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

## 16.4.3 Defined Values

### **remote\_url**

String type. URL of the remote file to download using TFTP/FTP/HTTP.

### **sync**

Integer in range [0-1]. Download handling type.

**Table 16-4:** *sync*

Value	Description
0	asynchronous: start the download and return immediately, report download progress and result via +SQNFGETREPORT URC. Command response indicates whether the download has been started successfully.
1	Default value. Return after the download has finished.

### **local\_filename**

String. Filename to store the file to. If <local\_filename> is specified, the command saves the file as <local\_filename> on the device's file system. In case <local\_filename> parameter is not specified, AT+SQNFGET switches AT channel to data mode and outputs downloaded binary octet stream to the host. In this scenario, host is responsible for error handling.

---

**Note:** Note that <local\_filename> is currently not supported. The parameter will be ignored if specified in the command.

---

## 16.4.4 Download Status URC: +SQNFGETREPORT

Command	Possible Response(s)
	+SQNFGETREPORT :<status>

The possible values of <status> are as follows:

**status**

String. File download status

**Table 16-5:** *sync*

Value	Description
"started"	Request sent to server
"downloading"	Server responded with success and started the transfer
"complete"	Download completed successfully
"error"	Error occurred while download process

## 16.5 File Upload: +SQNFPUT

### 16.5.1 Syntax

Command	Possible Response(s)
<code>AT+SQNFPUT=&lt;prof_id&gt;,&lt;command&gt;,&lt;resource&gt;,&lt;filename&gt;[,&lt;post_param&gt;[,&lt;extra_header_line&gt;]]</code>	+CME ERROR:<err>
<code>AT+SQNFPUT=?</code>	+SQNFPUT:<prof_id>,<command>,<r_length>,<filename>,<p_length>,<m_length> OK

### 16.5.2 Description

This command performs a HTTP POST or PUT request with file content to server.

Test command returns the range of supported values/lengths for all the subparameters.

When an answer from HTTP server is received, the `+SQNHTTPRING` URC is shown.

See also [Mobile Termination Error Result Code: +CME ERROR](#) for <err> values.

### 16.5.3 Defined Values

#### prof\_id

Integer in range [0-2]. HTTP profile identifier.

#### command

Integer in range [0-1]. HTTP request type.

**Table 16-6:** *command*

Value	Description
0	Post

**Table 16-6:** *command* (Continued)

Value	Description
1	Put

**resource**

String. Name of resource request is made to (URI).

**filename**

String. Name of the file to send.

**post\_param**

String. HTTP Content-Type identifier of request. Optionally followed by colon character (:) and an extension.

**Table 16-7:** *post\_param*

Value	Description
0	application/x-www-form-urlencoded
1	text/plain
2	application/octet-stream
3	multipart/form-data
	json-log-txt
	json-log-zip

## Notes:

For example, if ``<post_param>`` is set to "1;charset=us-ascii", then the request will contain "Content-type: text/plain; charset=us-ascii" header line.

`json-log-txt` and `json-log-zip` are special types, converting your file to json {"format": "zip|txt", "logs": "BASE\_64\_FILE"}



### **extra\_header\_line**

String. Additional HTTP header line to be included in the request. '@' character is used to identify header line ending. If you want to type '@' in header, just echo it with another '@'.

For example:

```
"gizmopal-device-access-token: UNDEFINED@@ FORMAT@@@battery-level: 100@"
```

is parsed to 2 header lines:

1) "gizmopal-device-access-token: UNDEFINED@ FORMAT@"

and

2) "battery-level: 100"

### **r\_length**

This parameter is used in command AT+SQNHTTPSND?

Integer, Maximum length of of parameter <resource>.

### **p\_length**

This parameter is used in command AT+SQNHTTPSND?

Integer. Maximum length of of parameter <post\_param>.

### **m\_length**

This parameter is used in command AT+SQNHTTPSND?

Integer. Maximum length of of parameter <extra\_header\_line>.

## 16.6 Retrieve Current GUTI: +SQNGUTI

### 16.6.1 Syntax

Command	Possible Response(s)
AT+SQNGUTI?	SQNGUTI : <mmeGrpId>,<mmeCode>,<mTmsi> OK
AT+SQNGUTI=?	OK

### 16.6.2 Description

This command reads Globally Unique Temporary ID (GUTI) assigned to the UE by the network.

This number is built as follows:

- PLMN (3 Bytes), Public Land Mobile Network: <plmn>
- MME Group ID (2 Bytes), MME Group Identifier: <mmeGrpId>
- MME Code (1 Byte), MME Code: <mmeCode>
- M-TMSI (4 Bytes), MME temporary Mobile Subscriber Identity: <mTmsi>

### 16.6.3 Defined Values

#### plmn

Numeric. Public Land Mobile Network in hexadecimal format. Empty if unknown.

#### mmeGrpId

Numeric. MME Group Identifier in hexadecimal format. Empty if unknown.

#### mmeCode

Numeric. MME Code in hexadecimal format. Empty if unknown.

#### mTmsi

Numeric. 4 bytes MME temporary Mobile Subscriber Identity in hexadecimal format. Empty if unknown.

## 16.7 Informal Network Scanning: +SQNINS

### 16.7.1 Syntax

Command	Possible Response(s)
AT+SQNINS=<action>	+SQNINS : <action>, <rb>, <ratINS>, <cell_Id>, <tac>, <plmn>, <earfcn>, <pci>, <bandwidth Download>, <rsrp>, <rsrq> [+SQNINS : ...] +CME ERROR : <err> OK
AT+SQNINS=?	+SQNINS : <action range> OK
AT+SQNINS?	+CME ERROR : <err>

### 16.7.2 Description

Write command triggers an informal network scanning (INS).

This operation consists in discovering surrounding cells available in all bands supported by the modem, then collect various information about scanned cells.

## 16.7.3 Defined Values

### **action**

Integer. Action to be taken for the informal network scanning.

**Table 16-8:** *action*

Value	Description
0	full informal network scanning. This scanning enable a full reporting of information extracted from MIB (Master information Block) and SIB1 (System Information Block 1).
1	fast informal network scanning. This scanning enable a reporting of information extracted from MIB (Master information Block) only.

### **rb**

Integer. Radio band (band\_id)

### **ratINS**

Integer. Radio Access Technology.

**Table 16-9:**

Value	Description
7	E-UTRAN.

### **cell\_Id**

Integer. Cell ID

### **tac**

Integer. Tracking Area Code

### **plmn**

Integer. Numeric PLMN, including MCC(Mobile Country Code)+MNC(Mobile Network Code).

### **earfcn**

Integer. Downlink E-UTRAN Absolute Radio Frequency Channel Number.

### **pci**

Integer. Physical Cell ID.

### **bandwidthDownload**

String. Downlink bandwidth

**Table 16-10:** *bandwidthDownload*

Value	Description
1.4	1400 kHz
3	3000 kHz
5	5000 kHz
10	10000 kHz
15	15000 kHz
20	20000 kHz

#### **rsrp**

Num float. Reference Signal Received Power in dBm.

#### **rsrq**

Num float. Reference Signal Received Quality in dB.

## 16.7.4 Usage Examples

- Full scanning

```
AT+SQNINS=0
```

```
+SQNINS: 0,4,7,"1A2D006","0001","00101",2350,6,10,-107.80,-5.80  
+SQNINS: 0,13,7,"1A2E005","0001","00101",5230,5,10,-94.90,-5.20  
+SQNINS: 0,4,7,"0","0000","000000",2050,2,20,-107.50,-6.10
```

```
OK
```

- Fast scanning

```
AT+SQNINS=1
```

```
+SQNINS: 1,13,7,"1A2E005","0001","00101",5230,5,10,-94.50,-3.60  
+SQNINS: 1,4,7,"0","0000","000000",2050,2,1.4,-104.90,-2.90  
+SQNINS: 1,4,7,"1A2D006","0001","00101",2350,6,10,-107.90,-5.90
```

```
OK
```

- Test command

```
AT+SQNINS=?  
(0-1)
```

```
OK
```

# 16.8 UART Interface Power Saving Configuration: +SQNIPSCFG

## 16.8.1 Syntax

Command	Possible Response(s)
AT+SQNIPSCFG=<mode>[,<timeout>]	+CME ERROR: <err> OK
AT+SQNIPSCFG?	+SQNIPSCFG: (0-2) , (100-10000)
AT+SQNIPSCFG=?	+SQNIPSCFG: <mode>[,<timeout>]

## 16.8.2 Description

Write command sets the UARTs power saving configuration, with global effect on the module power saving behavior.

---

**Important:** This command does not immediately apply mode transistions. A reset is required to apply a mode change.

---

Read command display power saving mode and timeout.

Available power modes:

- In <mode>=0, power saving is disabled. UART0, UART1, UART2 interfaces are permanently activated and module never enter into sleep mode.
- In <mode>=1, power saving is activated. UART0 interface is activated with sleep mode support (RTS0 line). UART2 and UART2 interfaces do not infer on module power saving behavior. Module does not enter sleep mode as long as the RTS0 line state is low.
- In <mode>=2, power saving is activated. UART0/UART1/UART2 interfaces are activated with sleep mode support (RTS0/1/2 lines) whenever applicable (HW flow control activated). Module does not enter sleep mode as long as one of RTS0/1/2 line state is low.

When power saving is enabled, module power state is controlled by RTS line:

- If the RTS line state is set to OFF, the power saving mode is allowed
- If the RTS line state is set to ON, the module shall exit from power saving mode

More precisely, when power saving is enabled:

- When no activity on UART, CTS line will be set to OFF state (driven high level) <timeout> milliseconds (100ms to 10s, default 5s) after the last sent character, then module will go to sleep mode as soon as DTE set RTS line to OFF state (driver high level).
- When module is in sleep mode, it can be waken-up by driving RTS0 line (<mode>=1 or 2) or one of RTS1/2 lines (<mode>=2) to ON state (low level). After RTS0/1/2 assertion (RTS line set ON state, e.g pin set to low level), and module waken-up, CTS line signals will change to ON state (low level), stating UART interfaces are ready to operate.

Notes:

- UART sleep mode support requires that CTS/RTS flow control be configured both on the UE side and the DTE side.
- In <mode>=1 or 2 the DTE can start sending data to the module without risk of data loss after having asserted the UART RTS line.
- Factory default is <mode>=1, <timeout>=5000 msec

See also [2.7 Mobile Termination Error Result Code: +CME ERROR](#) on page 62 for <err> values.

### 16.8.3 Defined Values

#### mode

Integer type. UART power saving mode.

**Table 16-11:** *mode*

Value	Description
0	power saving is disabled. UART0, UART1, UART2 interfaces are permanently activated and module never enter into sleep mode.
1	Default value. Power saving is activated. UART0 interface is activated with sleep mode support. Module power state is controlled by RTS0 line
2	power saving is activated. UART0/UART1/UART2 interfaces are activated with sleep mode support whenever applicable (HW flow control activated). Module power state is controlled by RTS0 and RTS1 lines.

#### timeout

Integer type in range (100 .. 10000). Inactivity timeout in milliseconds

In sleep modes (<mode>=1 or 2), guard time period during which no character should be received on UART before module entering in sleep mode.

Parameter is ignored if power saving is disabled (<mode>=0).

Default configuration is 5000 msec.

## 16.9 Set LED Blink Mode: +SQNLED

### 16.9.1 Syntax

Command	Possible Response(s)
AT+SQNLED=<mode>	OK ERROR +CME ERROR:<err>
AT+SQNLED?	+SQNLED:<mode> OK
AT+SQNLED=?	+SQNLED: (0-1) OK

### 16.9.2 Description

This command configures the control of light of a connected LED. The mode setting is persistent after reboot.

The LED is turned on only when AT+CFUN=1 or 4. It is turned off when AT+CFUN=0.

LED is steadily turned on when the ME is registered to the network and either awake or in power saving state. LED flashes when the ME is registered to the network and either awake or in power saving state. In this mode, the duration of flashing means various states, listed below:

- AT+CFUN=0 or 4. The ME is stopped or in Airplane mode. The LED is permanently turned off.
- AT+CFUN=1. LTE PS data transfer. The LED is permanently turned on.
- AT+CFUN=1. The ME is registered to a network, No call, no data transfer (in RRC Idle). The LED blinks (typically 1280 ms on, 3840 ms off).
- AT+CFUN=1. Limited Network Service (no SIM, no PIN, network search). The LED blinks (typically 500 ms on, 500 ms off).
- AT+CFUN=1. The ME is in deep SLEEP (eDRX or PSM). The LED is permanently turned off.



## 16.9.3 Defined Values

### **mode**

Integer. LED blink mode.

**Table 16-12:** *mode*

Value	Description
0	Set blink mode Off. The LED is switched off.
1	Set blink mode On. The LED will blink according to the system state.

## 16.10 Support of Cell Monitoring: +SQNMONI

### 16.10.1 Syntax

Command	Possible Response(s)
AT+SQNMONI=<n>	<ul style="list-style-type: none"> <li>When extracting data for the serving cell and the network name is known: +SQNMONI: &lt;netname&gt; RSRP:&lt;rsrp&gt; RSRQ:&lt;rsrq&gt; TAC:&lt;tac&gt; Id:&lt;id&gt; EARFCN:&lt;earfcn&gt; PWR:&lt;dBm&gt; DRX:&lt;drx&gt; PAGING:&lt;paging&gt;</li> <li>When the network name is unknown: +SQNMONI: Cc:&lt;cc&gt; Nc:&lt;nc&gt; RSRP:&lt;rsrp&gt; RSRQ:&lt;rsrq&gt; TAC:&lt;tac&gt; Id:&lt;id&gt; EARFCN:&lt;earfcn&gt; PWR:&lt;dBm&gt; DRX:&lt;drx&gt;</li> <li>When extracting data for neighbour cells: +SQNMONI: RSRP:&lt;rsrp&gt; RSRQ:&lt;rsrq&gt; Id:&lt;id&gt; EARFCN:&lt;earfcn&gt; PWR:&lt;dBm&gt;</li> <li>If report type #8 is selected, "RSRP:&lt;rsrp&gt;" is replaced by RSRP/CINR per receiver "RSRP0:&lt;rsrp0&gt; RSRP1:&lt;rsrp1&gt; CINR0:&lt;cinr0&gt; CINR1:&lt;cinr1&gt;"</li> <li>If report type #9 is selected, "RSRP:&lt;rsrp&gt;" is replaced by "RSRP:&lt;rsrp&gt; CINR:&lt;cinr&gt;"</li> </ul>
AT+SQNMONI?	+SQNMONI : <n> OK
AT+SQNMONI=?	+SQNMONI : (list of possible <n>s) OK

### 16.10.2 Description

This command allows to get information on the serving and neighbor cells.  
Test command returns values supported as a compound value.

## 16.10.3 Defined Values

**n**

integer type, it configures the cell from which to report information.

**Table 16-13:** *n*

Value	Description
0	Report information for the serving cell only
1	Report information for the intra-frequency cells only
2	Report information for the inter-frequency cells only
7	Report information for all cells
8	Report information for the serving cell only with RSRP/CINR measurements per antenna. Applicable to Calliope-based and Cassiopeia-based products only.
9	Report information for the serving cell only with RSRP/CINR measurements. Applicable to Monarch-based products only.

**netname**

String. Name of network operator

**cc**

Country code

**nc**

Network operator code

**n**

progressive number of adjacent cell

**id**

cell identifier

**dBm**

received signal strength in dBm

**drx**

Discontinuous reception cycle length

**rsrp**

Float. Reference Signal Received Power

**rsrp0**

Float. Reference Signal Received Power on antenna#0.

**rsrp1**

Float. Reference Signal Received Power on antenna#1.

**cinr0**

Float. Carrier to Interference-plus-Noise Ratio on antenna#0.

**cinr1**

Float. Carrier to Interference-plus-Noise Ratio on antenna#1.

**rsrq**

Float. Reference Signal Received Quality

**tac**

Tracking Area Code

**earfcn**

E-UTRA Assigned Radio Channel

**paging**

DRX cycle in number of radio frames (1 frame = 10ms).

## 16.10.4 Example

- Calliope-based device

```
AT+SQNMONI=8
+SQNMONI: Sequans Network RSRP0:-84.05 RSRP1:-81.42 CINR0:20.65
CINR1:18.94 RSRQ:-3.97 TAC:1 Id:1 EARFCN:5230 PWR
AT+SQNMONI=?
+SQNMONI: (0,1,2,7,8)
OK
```

- Monarch-based device

```
AT+SQNMONI=9
+SQNMONI: 00101 RSRP:-97.10 CINR:0.00 RSRQ:-8.40 TAC:1 Id:2
EARFCN:2150 PWR:-80.92 PAGING:128
AT+SQNMONI=?
+SQNMONI: (0,1,2,7,9)
OK
```

## 16.11 OMA LWM2M Battery Status: +SQNOMABATTST

### 16.11.1 Syntax

Command	Possible Response(s)
AT+SQNOMABATTST=<status>	OK
AT+SQNOMABATTST=?	+SQNOMABATTST: (0..6) OK

### 16.11.2 Description

This command writes battery status to LWM2M client. These value is accessible via LWM2M Device object (3) with corresponding id (20). Stored data will be persistent against device reboot.

### 16.11.3 Defined Values

#### status

Integer. Battery status according to LWM2M specification.

**Table 16-14:** *status*

Value	Description
0	Normal. The battery is operating normally and not on power.
1	Charging. The battery is currently charging.
2	Charge Complete. The battery is fully charged and still on power.
3	Damaged. The battery has some problem.
4	Low Battery. The battery is low on charge.
5	Not Installed. The battery is not installed.
6	Unknown. The battery information is not available.

## 16.12 OMA LWM2M Host Device Identification Data: +SQNOMAHDEV

### 16.12.1 Syntax

Command	Possible Response(s)
AT+SQNOMAHDEV	OK
AT+SQNOMAHDEV?	List of +SQNOMAHDEV: <instId>, <index>, <value> OK
AT+SQNOMAHDEV=?	+SQNOMAHDEV: (0..1), (0..3), value OK

### 16.12.2 Description

This command reads and writes Host Device Identification values such as UID, Device model, Firmware version.

These values are accessible via LWM2M objects Host Device (10255) and Portfolio (16). Stored data will be persistent against device reboot.

## 16.12.3 Defined Values

### **instId**

Integer. Instance index.

### **index**

Integer. Value index.

**Table 16-15:** *state*

Value	Description
0	UID
1	Manufacturer
2	Model
3	FW Version

### **value**

String. Arbitrary identification string.

## 16.12.4 Example

1. Review default values after the first boot

```
$ AT+SQNOMAHDEV?  
+SQNOMAHDEV: 0, 0, HUID0  
+SQNOMAHDEV: 0, 1, HMAN0  
+SQNOMAHDEV: 0, 2, HMOD0  
+SQNOMAHDEV: 0, 3, HFW0  
+SQNOMAHDEV: 1, 0, HUID1  
+SQNOMAHDEV: 1, 1, HMAN1  
+SQNOMAHDEV: 1, 2, HMOD1  
+SQNOMAHDEV: 1, 3, HFW1  
OK
```

## 2. Modify default values

```
$ AT+SQNOMAHDEV=0,2,"Some module #1"  
OK  
$ AT+SQNOMAHDEV=1,3,"Some firmware #2"  
OK  
$ AT+SQNOMAHDEV?  
+SQNOMAHDEV: 0, 0, HUID0  
+SQNOMAHDEV: 0, 1, HMAN0  
+SQNOMAHDEV: 0, 2, Some module #1  
+SQNOMAHDEV: 0, 3, HFW0  
+SQNOMAHDEV: 1, 0, HUID1  
+SQNOMAHDEV: 1, 1, HMAN1  
+SQNOMAHDEV: 1, 2, HMOD1  
+SQNOMAHDEV: 1, 3, Some firmware #2  
OK
```

## 3. Values seen by Verizon (Host Device Object) LWM2M nodes

```
$ AT+SQNOMAGET="/10255"  
+SQNOMAGET: /10255/0/0 LWM2M_TYPE_STRING: HMAN0  
+SQNOMAGET: /10255/0/1 LWM2M_TYPE_STRING: Some module  
#1  
+SQNOMAGET: /10255/0/2 LWM2M_TYPE_STRING: HUID0  
OK  
$ AT+SQNOMAGET="/10255/1"  
+SQNOMAGET: /10255/1/0 LWM2M_TYPE_STRING: HMAN1  
+SQNOMAGET: /10255/1/1 LWM2M_TYPE_STRING: HMOD1  
+SQNOMAGET: /10255/1/2 LWM2M_TYPE_STRING: HUID1  
OK
```

## 4. Values seen by AT&T (Portfolio Object) LWM2M nodes

```
$ AT+SQNOMAGET="/16"  
+SQNOMAGET: /16/0/0 LWM2M_TYPE_STRING: HUID0  
+SQNOMAGET: /16/0/1 LWM2M_TYPE_STRING: HMAN0  
+SQNOMAGET: /16/0/2 LWM2M_TYPE_STRING: Some module #1  
+SQNOMAGET: /16/0/3 LWM2M_TYPE_STRING: HFW0  
OK  
$ AT+SQNOMAGET="/16/1"  
+SQNOMAGET: /16/1/0 LWM2M_TYPE_STRING: HUID1  
+SQNOMAGET: /16/1/1 LWM2M_TYPE_STRING: HMAN1  
+SQNOMAGET: /16/1/2 LWM2M_TYPE_STRING: HMOD1  
+SQNOMAGET: /16/1/3 LWM2M_TYPE_STRING: Some firmware #2  
OK
```



## 16.13 RING Line Behavior Configuration: +SQNRICFG

### 16.13.1 Syntax

Command	Possible Response(s)
AT+SQNRICFG=[<mode>][,<events>][,<timeout>]	+SQNRICFG:<mode>,<events>,<timeout>
AT+SQNRICFG?	+SQNRICFG:<mode>,<events>,<timeout>
AT+SQNRICFG=?	+SQNRICFG: [(0-2)] [, (0-3)] [, (1000-5000)]

### 16.13.2 Description

This command sets the RING line behavior according to the channel (defined by <mode> parameter), the <events> selected and a <timeout>.

### 16.13.3 Defined Values

#### mode

Integer. RING line behavior for signaling URCs both for idle interface and while interface is reserved, i.e. while busy on AT command execution or data transmission. This functionality serves to fine-tune the conditions under which the ME signals service request to the TE.

**Table 16-16:** *mode*

Value	Description
0	URCs are not indicated by a ring line.
1	(default): URCs are indicated by an activated ring line on the same interface where the URC appears. If URC is presented on AT channel mapped to UART0, then ring line will be activated. If URC happen on an AT channel not mapped to UART0, then RING line will remain silent.
2	All URCs are indicated by activated RING0 line of the UART0 interface, whatever URC AT channel origin

**events**

Integer in range [0-3]. Event.

**Table 16-17: events**

Value	Description
0	RING activation triggered by no event
1	RING activation triggered by general URC events
2	RING activation triggered by data events
3	(default): RING activation triggered by general URC events and data.

**timeout**

RING line active duration, integer in range [1000-5000]

This parameter determines how long, in milliseconds, the RING line is activated in order to indicate a URC or pending data. No value (Default) means leave previous timeout with no change.

## 16.13.4 Usage Examples

- Read configuration:
 

```
AT+SQNRICFG?
+SQNRICFG: 1,3,1000
OK
```
- Write default configuration and read again:
 

```
AT+SQNRICFG
OK
AT+SQNRICFG?
+SQNRICFG: 2,3,1000
OK
```
- Write other configuration and read again:
 

```
AT+SQNRICFG=0,0
OK
AT+SQNRICFG?
+SQNRICFG: 0,0,1000
OK
```

## 16.14 SSL/TLS Security Profile Configuration: +SQNSPCFG

### 16.14.1 Syntax

Command	Possible Response(s)
<b>AT+SQNSPCFG=&lt;spId&gt;[,&lt;version&gt;,[&lt;cipherSpecs&gt;],[&lt;certValidLevel&gt;],[&lt;caCertificateID&gt;],[&lt;clientCertificateID&gt;],[&lt;clientPrivateKeyID&gt;],[&lt;psk&gt;]]]]]]]</b>	+SQNSPCFG : <spId>,<version>,<cipherSpecs>,<certValidLevel>,<caCertificateID>,<clientCertificateID>,<clientPrivateKeyID>,<psk> +CME ERROR : <err> OK
<b>AT+SQNSPCFG</b>	+SQNSPR : 1 , <version1>,<cipherSpecs1>,<certValidLevel1>,<caCertificateID1>,<clientCertificateID1>,<clientPrivateKeyID1>,<psk1><CR><LF> ... +SQNSPR : 6 , <version6>,<cipherSpecs6>,<certValidLevel6>,<caCertificateID6>,<clientCertificateID6>,<clientPrivateKeyID6>,<psk6> OK
<b>AT+SQNSPCFG=?</b>	+SQNSPCFG: (1-6) , (0-4) , (list of supported cipher suites) , (0x00-0xFF) , (1-19) , (1-19) , (1-19) , OK

### 16.14.2 Description

This command sets the security profile parameters required to configure the following SSL/TLS connections properties.

A security profile is identified by a unique ID <spId>. Up to 6 security profiles can be configured. Each security profile cover the following SSL/TLS connections properties:

1. Minimum SSL/TLS protocol <version> to use:
  - TLS v1.0
  - TLS v1.1
  - TLS v1.2
  - TLS v1.3 (future support)

2. List of cipher suites (<cipherSpecs>) to be used for SSL/TLS connection security settings negotiation.

Warning: If the remote server does not support one of the cipher suites configured in the <cipherSpecs> list, the handshake fails.

Note: For security reason, it is recommended to reduce the list to a minimum and include only strong suites, in order to avoid a "man in the middle" downgrade attack.

3. Server certificate validation level <certValidLevel>:
  - No certificate validation
  - Certificate validation done against a specific or a list of imported trusted root certificates
  - Certificate validity period verification
  - Server URL verified against certificate common name field
4. Certificate to be used for server and mutual authentication (certificates are imported with AT+SQNSNVW="certificate" command):
  - <caCertificateID> (num): The trusted Certificate Authority certificate
  - <clientCertificateID> (num): The client certificate
  - <clientPrivateKeyID> (num): The client private key (password protected keys are not supported)
5. Pre-shared key <psk> used for connection (when a TLS\_PSK\_\* cipher suite is used).

To reset all the parameters of <spId> security profile, use AT+SQNSPCFG=<spId>, 255 command.

Write command with only security profile ID (AT+SQNSPCFG=<spId>) can be used to display the requested security profile.

To display all configuration profiles, exec command (AT+SQNSPCFG) shall be used.

Examples:

```
+SQNSPCFG:1,0,"0x2f;0x3C;0x35;0x3D",0,,,,
+SQNSPCFG:1,3,"0x3D",3,1,2,3,
```

The exhaustive list of supported cipher suites can be extracted from Test AT command (3rd parameter).

## 16.14.3 Defined Values

### spId

Security Profile identifier, integer in range [0-6].

### version

Minimum SSL/TLS version, integer in range [1-4]

**Table 16-18:** *version*

Value	Description
1	TLS 1.0
2	TLS 1.1
3	(default): TLS 1.2
4	TLS 1.3 (For future support)
255	reset the profile

### cipherSpecs

String. Exact list of cipher suite to be used, 8-bit hexadecimal "0x" prefixed IANA numbers, semicolon delimited.

Cipher suites are identified by their IANA (Internet Assigned Numbers Authority) TLS Cipher Suite Registry number.

Cipher suite list is ordered by priority (highest priority first).

The factory default value is an empty string, meaning any of the supported cipher can be used.

Supported cipher suites (IANA number: RFC Name):

- 0x002f: TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA
- 0x003C: TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256
- 0x0035: TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA
- 0x003D: TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256
- 0x008c: TLS\_PSK\_WITH\_AES\_128\_CBC\_SHA
- 0x008d: TLS\_PSK\_WITH\_AES\_256\_CBC\_SHA
- 0x00ae: TLS\_PSK\_WITH\_AES\_128\_CBC\_SHA256
- 0x00af: TLS\_PSK\_WITH\_AES\_256\_CBC\_SHA384

Example: <cipherSpecs>="0x2f;0x3C;0x35;0x3D"

Warning: If the remote server does not support one of the cipher suites configured in the <cipherSpecs> list, the handshake fails.

Note: For security reason, it's recommended to reduce the list to the minimum to avoid "man in the middle" attack style.

### **certValidLevel**

Server certificate validation 8-bit field, integer (bitmap) in range [0x00-0xFF].

Configuration bits:

- All 0 (default): certificate not validated
- Bit 0 set to 1: certificate validation done against a specific or a list of imported trusted root certificates
- Bit 1 set to 1: certificate validity period verification (on top of bit 0)
- Bit 3 set to 1: server URL verified against certificate common name field (on top of bit 0)
- Bit 4-7 are reserved for future use

As an example: to activate certification verification including validity period check, <certValidLevel>=0x03

### **caCertificateID**

Trusted Certificate Authority certificate ID, integer in range [0-19].

Exact CA certificate to use to validate server certificate ID. CA certificate should be imported with AT+SQNSNVW="certificate" command. When parameter is not provided (default), no certificate is referenced.

### **clientCertificateID**

Client certificate ID, integer in range [0-19].

Client certificate is used to authenticate the client in the case where mutual authentication is requested. Client certificate should be imported with AT+SQNSNVW="certificate" command. When parameter is not provided (default), no certificate is referenced.

### **clientPrivateKeyID**

Client private key ID, integer in range [0-19].

Client private key is used to authenticate the client in the case where mutual authentication is requested. Client private key should be imported with the AT+SQNSNVW="certificate" command. When the parameter is not provided (default), no key is referenced.

---

**Note:** Password protected keys are not supported

---

### **psk**

String. Pre-shared key used for connection (when a TLS\_PSK\_\* cipher suite is used)

The factory default value is an empty string, meaning no pre-shared key defined

## 16.14.4 Usage Examples

- Read configurations:

```
AT+SQNSPCFG
+SQNSPCFG: 1,3,"0x3D",0,1,1,1,"3F"
+SQNSPCFG: 5,2,"0x3D;0x2F;0x8C",3,3,,19,"3F"
```

OK

- Write configuration:

```
AT+SQNSPCFG=5,2,"0x3D;0x2F;0x8C",0,,,19,"3F"
+SQNSPCFG: 5,2,"0x3D;0x2F;0x8C",0,,,19,"3F"
OK
```

## 16.14.5 SSL/TLS Security Introduction

This section summarizes a brief introduction to SSL/TLS.

Transport Layer Security (TLS) and its predecessor, Secure Sockets Layer (SSL), both frequently referred to as "SSL", are cryptographic protocols that provide communications security over a computer network. Several versions of the protocols are currently widely used:

- TLS Protocol Version 1.0: RFC 2246 - <https://www.ietf.org/rfc/rfc2246.txt>
- TLS Protocol Version 1.1: RFC 4346 - <https://www.ietf.org/rfc/rfc4346.txt>
- TLS Protocol Version 1.2: RFC 5246 - <https://www.ietf.org/rfc/rfc5246.txt>
- TLS Protocol Version 1.3: IETF draft #21 - <https://tools.ietf.org/html/draft-ietf-tls-tls13-21>

The Transport Layer Security protocol aims primarily to provide privacy and data integrity between two communication entities. When secured by TLS, connections between a client and a server have one or more of the following properties:

- The connection is private (or secure) because symmetric cryptography is used to encrypt the data transmitted. The keys for this symmetric encryption are generated uniquely for each connection and are based on a shared secret negotiated at the start of the session (TLS handshake protocol). The server and client negotiate the details of which encryption algorithm and cryptographic keys to use before the first byte of data is transmitted. The negotiation of a shared secret is both secure (the negotiated secret is unavailable to eavesdroppers and cannot be obtained, even by an attacker who places themselves in the middle of the connection) and reliable (no attacker can modify the communications during the negotiation without being detected).
- The identity of the communicating parties can be authenticated using public-key cryptography. This authentication can be made optional, but is generally required and should be mutual (both device and server are authenticated).

- The connection ensures integrity because each message transmitted includes a message integrity check using a message authentication code to prevent undetected loss or alteration of the data during transmission.

TLS supports many different methods for exchanging keys, encrypting data, and authenticating message integrity. The set of algorithms used to negotiate security settings of an SSL/TLS connection is identified by a cipher suite. Cipher suites are identified by their IANA (Internet Assigned Numbers Authority) TLS Cipher Suite Registry number (<https://www.iana.org/assignments/tls-parameters/tls-parameters.xhtml#tls-parameters-4>), and includes:

- Key exchange algorithm used for the authentication during the handshake: RSA, PSK, RSA\_PSK...
- Encryption algorithm used to encrypt the message: AES\_128\_CBC, AES\_256\_CBC...
- Hash function for data integrity (HMAC: Hash Message Authentication Code): SHA, SHA256, SHA384...

Digital certificates can also be used to provides:

- Server authentication: use of the server certificate verification against a specific trusted certificate or a trusted certificates list
- Client authentication: use of the client certificate and the corresponding private key

The security aspects used in the active connection is negotiated between client and server at connection establishment based on the security configuration/features supported by the communicating entities. As a consequence, client security profile should be tuned carefully to meet the security level requested by the user application.

---

**Note:** For best security, we strongly advice to configure mutual authentication TLS connections. Drawbacks of this high security level is increase of the connection setup data and time, so power consumption increase.

---

In order to configure all the described aspects of SSL/TLS security protocol, several AT commands should be used:

- AT+SQNSNVR and AT+SQNSNVW: Read/write X.509 certificates and private keys from/to the non-volatile (NV) memory. Up to 20 certificates/keys can be stored.
- AT+SQNSPCFG: SSL/TLS connection security profile configuration. Up to 6 security profiles can be configured

Any connection using secure connection should refer to security profile ID to benefit from the corresponding SSL/TLS configuration:

- AT+SQNSSCFG: Secure socket configuration
- AT+SQNMQTT: MQTT protocol over TLS



## 16.15 Wake Lock Management: +SQNWL

### 16.15.1 Syntax

Command	Possible Response(s)
AT+SQNWL=<app>[,<wl_mask>]	+CME ERROR:<err> +SQNWL:<app>,<wl_mask> OK
AT+SQNWL?	+SQNWL:<app1>,<mask1> [<CR><LF>...<CR><LF>+SQNWL:<appN>,<maskN>[...]] OK
AT+SQNWL=?	+SQNWL:" ", (0-3) OK

### 16.15.2 Description

This command manages resources wake locks to indicate that a client application running on the Host CPU needs to secure full and immediate availability of some device resources, which implies to prevent the considered resources to enter sleep mode.

Currently, the wake-lockable system resources are:

- CPU and external interfaces (UART, GPIO)
- Device memory (RAM)

The Set command is used to set and release the wake locks based on the resource identified by the bitmask <wl\_mask>. To set the wake locks and prevent the sleep mode for the specified resource(s), <wl\_mask> bit(s) should be set to 1. To release the wake locks and allow sleep mode for the specified resource(s), <wl\_mask> bit(s) should be set to 0.

---

**Note:** The wake locks configuration is volatile. It is lost at reboot.

---

The Set command entered with bitmask omitted will return the wake lock defined by the <app> client application.

The Read command returns the list of client applications using wake locks and lock status.

---

**Caution:** It is very important release wake lock as soon as possible to avoid running down the device's battery excessively. Each application <app> setting a wake lock to 1 should explicitly reset it to 0 when the need for resource availability is not present anymore.

---

## 16.15.3 Defined Values

### app

Client application name, string.

### wl\_mask

Bitmask as integer in range [0-3] identifying the resource to keep available. Bitis set to 1 to keep the resource available and prevent sleep mode, or reset to 0 to release.

**Table 16-19:** *wl\_mask*

Value	Description
0	Default value. No system resource locked
Bit 0 (0x01)	Keep CPU and external interfaces (UART, GPIO) active. Prevents the CPU and external interfaces to enter sleep mode.
Bit 1 (0x02)	Keep device's RAM memory active. Prevents the device's RAM memory to enter sleep mode.
Bits 0 and 1 (0x03)	Keep CPU, external interfaces (UART, GPIO) and device's RAM memory active. Prevents the CPU, external interfaces and device's RAM memory to enter sleep mode.

---

# A

# Abbreviations

**Table A-1:** List of Abbreviations

<b>Abbreviation</b>	<b>Description</b>
DVI	Digital Voice Interface
GPIO	General Purpose Input output
I2C	Inter-Integrated Circuit
I2S	Integrated Interchip Sound
IMSI	International Mobile Subscriber Identification
MO	Mobile Originated
MT	Mobile Termination
PCM	Pulse Code Modulation
SCL	I2C Serial Clock Line
SDA	I2C Serial Data Line
SIM	Subscriber identity module
SMS	Short Message Service
TA	Terminal adapter
TDM	Time Division Multiplexing
TE	Terminal Equipment
UE	User Equipment