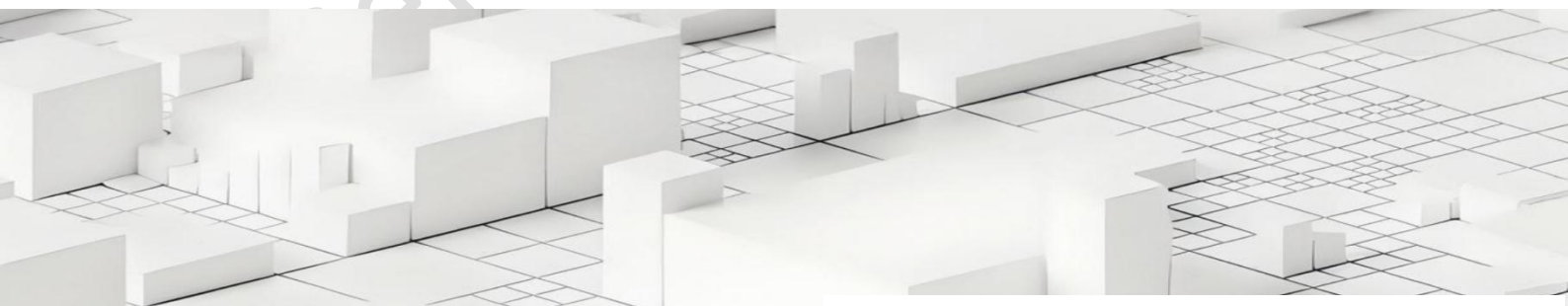




TC10A Series AT Command Manual

LTE CAT1



Cellslink Technology (Shanghai) Co., Ltd

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1 Introduction

1.1 Scope of the document

This document presents the AT commands set for TC10A series module.

1.2 Definitions

For the purposes of the present document, the following syntactical definitions apply:

<CR>	Carriage return character.
<LF>	Line feed character.
<...>	Name enclosed in angle brackets is a syntactical element. Angle brackets themselves do not appear in the command line.
[...]	Optional sub parameter of AT command or an optional part of TA

information response is enclosed in square brackets. Brackets themselves do not appear in the command line. If sub parameter is not given, its value equals to its previous value or the recommended default value.

Underline Underlined and defined sub parameter value is the recommended default setting or factory settings.

1.3 AT Command Syntax

AT command line must start with **AT** or **at** and end with **<CR>**, except A/ and +++. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. Throughout this document, only AT commands and responses are presented, while carriage return and line feed characters are deliberately omitted.

● Basic Command

The format of Basic Command is "AT<x><n>" or "AT&<x><n>", where "<x>" is the command name, and "<n>" is/are the parameter(s) for the basic command which is optional. For example "ATE<n>", which informs the TA/DCE whether received characters should be echo back to the TE/DTE or not according to the value of "<n>"; "<n>" is optional and a default value will be used if omitted.

● Extended Command

The Extended Command has several operation syntax, as below table:

Extended Command syntax	
Test Command AT+<cmd>=?	Returns the list of parameters and value ranges, which can be set by write command.
Read Command AT+<cmd>?	Return the currently set value of the parameter.
Write Command AT+<cmd>=<...>	Set user definable parameter value.
Execution command AT+<cmd>	Return a specific parameter value or perform a specific action.

1.4 Supported Character Sets

The AT command interface of LTE standard modules defaults to the **IRA** character set.

LTE standard modules support the following character sets:

- IRA
- UCS2
- GSM format

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

2 General commands

2.1 ATI display product identification information

This command is used to request identification information from a modem or communication device. This command typically returns details such as the manufacturer name, model number, firmware version, and other relevant product identifiers.

ATI	
Execution Command ATI	Response Manufacturer: Cellslink Model: <model> Revision: <revision> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<model>: string type, module info.
<revision>: string type, product software version.

Examples

ATI
Manufacturer: Cellslink
Model: TC10A
Revision: R01A01

OK

2.2 AT+CGMI request manufacturer identification

This command is used to request the manufacturer identification of a mobile device.

AT+CGMI	
Test Command AT+CGMI=?	Response OK
Execution Command AT+CGMI	Response Cellslink OK
Characteristic	-
Max Response Time	300ms
Reference	-

Examples

AT+CGMI

Cellslink

OK

2.3 AT+CGMM request model identification

This command is used to request the model identification of a mobile device.

AT+CGMM	
Test Command AT+CGMM=?	Response OK
Execution Command AT+CGMM	Response <model> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<model>: string type, identifier of device.

Examples

AT+CGMM

TC10A

OK

2.4 AT+CGMR request the software revision

This command is used to request the software revision or version information of a mobile device.

AT+CGMR	
Test Command AT+CGMR=?	Response OK
Execution Command AT+CGMR	Response <revision> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<revision>: string type, software revision of device.

Examples

AT+CGMR

R01A01

OK

2.5 AT+CGSN request international mobile equipment identity(IMEI)

This command is used to request the International Mobile Equipment Identity (IMEI) number of a mobile terminal or module.

AT+CGSN	
Test Command AT+CGSN=?	Response OK

Execution Command AT+CGSN	Response <IMEI> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<IMEI>: string type, IMEI of mobile terminal.

Examples

AT+CGSN
001068000000006

OK

2.6 AT+GMI request manufacturer identification

AT+GMI is an AT command used to request the manufacturer identification of a mobile device.

AT+GMI	
Test Command AT+GMI=?	Response OK
Execution Command AT+GMI	Response Cellslink OK
Characteristic	-
Max Response Time	300ms
Reference	-

Examples

AT+GMI
Cellslink

OK

2.7 AT+GMM request model identification

This command is used to request the model identification of a mobile device.

AT+GMM	
Test Command AT+GMM=?	Response OK
Execution Command AT+GMM	Response <model> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<model>: string type, identifier of device.

Examples

AT+GMM

TC10A

OK

2.8 AT+GMR request the software revision

This command is used to request the software revision or version information of a mobile device.

AT+GMR	
Test Command AT+GMR=?	Response OK
Execution Command AT+GMR	Response <revision> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<revision>: string type, software revision of device.

Examples

AT+GMR

R01A01

OK

2.9 AT+GSN request international mobile equipment identity(IMEI)

This command is used to request the International Mobile Equipment Identity (IMEI) number of a mobile terminal or module.

AT+CGMR	
Test Command AT+GSN=?	Response OK
Execution Command AT+GSN	Response <IMEI> OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<IMEI>: string type, IMEI of mobile terminal.

Examples

AT+GSN

001068000000006

OK

2.10 ATE set command echo mode

ATE command sets whether TA echoes characters or not.

ATE	
Execution Command ATE[<value>]	Response OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 – echo mode off

1 – echo mode on

Examples

ATE1

OK

2.11 ATZ restore AT command settings

This command restore AT command settings from non-volatile memory of ME.

ATZ	
Execution Command ATZ[<value>]	Response OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 – restore

Examples

ATZ0

OK

2.12 ATQ set result code presentation mode

This commands controls whether the result code is transmitted to the TE or not, other information text transmitted as response is not affected.

ATQ	
Execution Command ATQ<value>	Response 1) if value=0 OK 2) if value=1 (none)
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 – TA transmit result code

1 – result code not transmitted

Examples

ATQ0

OK

2.13 ATV set response format code

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

ATV	
Execution Command ATV[<value>]	Response 1) if value=0 0 2) if value=1 OK
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 - Information response: <text><CR><LF>

Short result code format: <numeric code><CR>

1 - Information response: <CR><LF><text><CR><LF>

Long result code format: <CR><LF><verbose code><CR><LF>

Examples

ATV1

OK

2.14 ATX set connect result code format

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

ATX

Execution Command	Response
ATX<value>	OK
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	V2.5ter

Parameters

<value>: integer type

0 – Only **CONNECT** result code returned, dial tone and busy detection are both disabled.

1 – Only **CONNECT<text>** result code returned, dial tone and busy detection are both disabled.

2 – **CONNECT<text>** result code returned, dial tone detection is enabled, and busy detection is disabled.

3 – **CONNECT<text>** result code returned, dial tone detection is disabled, and busy detection is enabled.

4 – **CONNECT<text>** result code returned, and dial tone and busy detection are both enabled.

Examples

ATX1

OK

2.15 AT&W store AT command settings to NVM

This AT command stores current AT command settings to non-volatile memory of ME. Executed ATZ or after power on reset will restore AT command settings from non-volatile memory of ME.

AT&W	
Execution Command AT&W[<value>]	Response OK
Characteristic	-
Max Response Time	300ms
Reference	V2.5ter

Parameters

<value>: integer type

0 – number to store AT command settings

Examples

AT&W

OK

AT&W0

OK

2.16 AT&F reset AT command settings to factory

default

This command resets AT command settings to factory default values.

AT&F	
Execution Command AT&F[<value>]	Response OK
Characteristic	-
Max Response Time	300ms
Reference	V2.5ter

Parameters

<value>: integer type

0 – reset all AT command settings to factory default

Examples

AT&F

OK

AT&F0

OK

2.17 AT&V display current configuration

This command displays current settings of several AT command parameters.

AT&V	
Execution Command AT&V	Response <text> OK
Characteristic	-
Max Response Time	300ms
Reference	V2.5ter

Parameters

<text>: string type, several AT command parameters

Examples

AT&V

&C: 0

&D: 0

&F: 0

&W: 0

E: 1

Q: 0

V: 1

X: 0

Z: 0

S0: 0

S2: 43

S3: 13

S4: 10

S5: 8

S6: 2

S7: 1

S8: 2

S9: 6

S10: 7

S11: 63

S30: 10

OK

2.18 AT+CSCS select TE character set

This command informs the MT which character set is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

AT+CSCS	
Test Command AT+CSCS=?	Response +CSCS: (list of supported <chset>s) OK
Read Command AT+CSCS?	Response +CSCS: <chset> OK
Write Command AT+CSCS=<chset>	Response OK
Characteristic	This command takes effect immediately, and will not be saved.
Max Response Time	300ms
Reference	-

Parameters

<chset>: string type,
 "IRA" International reference alphabet.
 "GSM" GSM default alphabet.
 "UCS2" 16-bit unicode character set

Examples

AT+CSCS=?
+CSCS: ("IRA","UCS2","GSM")

OK

AT+CSCS?
+CSCS: "IRA"

OK

AT+CSCS=GSM**OK**

3 Serial interface control commands

3.1 AT&C configure DCD function mode

This command determines how the state of DCD pin relates to the detection of received line signal from the distant end.

AT&C	
Execution Command AT&C[<value>]	Response OK
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 – DCD line is always on

1 – DCD line is on only in the presence of data carrier

Examples

AT&C**OK****AT&C0****OK****AT&C1****OK**

3.2 AT&D configure DTR function mode

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

AT&D

Execution Command AT&D[<value>]	Response OK
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<value>: integer type

0 – TA ignores status on DTR

1 – DTR LOW -> HIGH, change to command mode while remaining the connected call.

2 – DTR LOW -> HIGH, disconnect data call, and change to command mode. When DTR is high level, auto answer function is disabled.

Examples

AT&D

OK

AT&D0

OK

AT&D1

OK

AT&D2

OK

3.3 AT+IPR configure local baud rate

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

AT+IPR

Test Command AT+IPR=?	Response +IPR: (list of supported <baud rate>s) OK
Read Command AT+IPR?	Response +IPR: <baud rate> OK
Write Command AT+IPR=<baud rate>	Response OK

Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<baud rate>: integer type, support:

4800,9600,19200,38400,57600,115200,230400,460800,921600

Examples

AT+IPR=?

+IPR=(4800,9600,19200,38400,57600,115200,230400,460800,921600)

OK

AT+IPR?

+IPR: 115200

OK

AT+IPR=921600

OK

3.4 AT+IFC configure local data flow control

This command is used to configure local data flow control between the Terminal Equipment (TE) and the Mobile Equipment (TA) in serial communication (e.g., GSM/GPRS/LTE modules, modems). It determines how data flow is managed to prevent buffer overflow and ensure reliable transmission.

AT+IFC	
Test Command AT+IFC=?	Response +IFC: (list of supported <DCE>s), (list of supported <DTE>s) OK
Read Command AT+IFC?	Response +IFC: <DCE>,<DTE> OK
Write Command AT+IFC=<DCE>,<DTE>	Response OK

Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<DCE>: integer type

0 – none

2 – RTS hardware flow control enable

<DTE>: integer type

0 – none

2 – CTS hardware flow control enable

Examples

AT+IFC=?

+IFC: (0,2),(0,2)

OK

AT+IFC?

+IFC: 0,0

OK

AT+IFC=2,2

OK

3.5 AT+ICF configure control character framing

This command is used to configure TE-TA (Terminal Equipment-Terminal Adapter) control character framing in serial communication between a host controller (e.g., PC, MCU) and a cellular modem (e.g., GSM/GPRS/LTE module). It defines the data framing parameters, including data bits, parity, and stop bits, ensuring proper synchronization and error-free data transmission.

AT+ICF

Test Command

AT+ICF=?

Response

+ICF: (list of supported <format>s), (list of supported <parity>s)

	OK
Read Command AT+ICF?	Response +ICF: <format>,<parity> OK
Write Command AT+ICF=<format>,<parity>	Response OK
Characteristic	This command takes effect immediately, and can be saved by AT&W.
Max Response Time	300ms
Reference	-

Parameters

<format>: integer type

0 – data bits 8, parity enable, stop bits 1

1 – data bits 8, parity none, stop bits 1

2 – data bits 7, parity enable, stop bits 1

3 – data bits 7, parity none, stop bits 1

<parity>: integer type

0 – odd

1 – even

2 – none

Examples

AT+ICF=?

+ICF: (0-3),(0-2)

OK

AT+ICF?

+ICF: 1,2

OK

AT+ICF=1,2

OK

4 Hardware related commands

4.1 AT+CLPOWD power down

This command is used to power off module.

AT+CLPOWD	
Test Command AT+CLPOWD=?	Response +CLPOWD: (list of supported <type>s) OK
Write Command AT+CLPOWD=<type>	Response POWER DOWN OK
Execution Command AT+CLPOWD	Response POWER DOWN OK
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<type>: inter type

0 – immediately power down

1 – de-active network and later power down

Examples

AT+CLPOWD=1

OK

POWER DOWN

AT+CLPOWD=0

OK

POWER DOWN

AT+CLPOWD

OK

POWER DOWN

4.2 AT+CLSCLK configure sleep mode

This command controls system enter sleep with DTR or UART RXD status.

AT+CLSCLK

Test Command AT+CLSCLK=?	Response +CLSCLK: (list of supported <mode>s), (list of supported <RRC>s) OK
Write Command AT+CLSCLK=<mode>[,<rrc>]	Response OK
Characteristic	This command takes effect immediately, and will not be saved.
Max Response Time	300ms
Reference	-

Parameters

<mode>: inter type

0 – disable enter sleep

1 – enable enter sleep when get DTR is high level

2 – enable enter sleep when UART RXD status is idle

<rrc>: inter type, RRC release time, range is 1 – 50, default is 3, unit is second.

Examples

AT+CLSCLK=?

+CLSCLK: (0-2),(1-50)

OK

AT+CLSCLK=1

OK

AT+CLSCLK?

+CLSCLK: 0,3

OK

AT+CLSCLK=1

OK

AT+CLSCLK=1,10

OK

5 (U)SIM related commands

5.1 AT+CIMI request International Mobile Subscriber

Identity(IMSI)

This command is used to request the International Mobile Subscriber Identity (IMSI) from the SIM card in a mobile device.

AT+CIMI	
Test Command AT+CIMI=?	Response OK
Execution Command AT+CIMI	Response 1) <IMSI> OK 2) +CME ERROR: <err>
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<IMSI>: string type, without double quotes, International Mobile Subscriber Identity.

<err>: error code.

Examples

AT+CIMI=?

OK

AT+CIMI

460088348701793

OK

5.2 AT+CLCK facility lock

This command is used to lock, unlock, or query the status of facility locks (such as SIM lock, call barring, etc.) on a mobile device. It is part of the GSM/UMTS supplementary services and allows control over various security and service restriction features.

AT+CLCK	
Test Command AT+CLCK=?	Response +CLCK: (list of supported<fac>s) OK
Write Command AT+CLCK=<fac>,<mode>[,<passwd>,<class>]	Response 1) If <mode> is not equal to 2 and command is set successfully. OK 2) If <mode> is equal to 2 and command is set successfully. +CLCK: <status>[,<class>] [+CLCK: <status>[,<class>]] [...] OK 3) ERROR 4) +CME ERROR: <err>
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<fac>: string type

"SC": SIM card lock (requires PIN on startup).

"AO": Barr All Outgoing Calls.

"OI": Barr Outgoing International Calls.

"OX": Barr Outgoing International Calls except to Home Country.

"AI": Barr All Incoming Calls.

"IR": Barr Incoming Calls when roaming outside the home country.

"AB": All Barring services (applicable only for <mode>=0).

"AG": All Outgoing barring services (applicable only for <mode>=0).

"AC": All Incoming barring services (applicable only for <mode>=0).

"FD": SIM fixed dialing memory feature.

"PN": Network Personalization.
 "PU": network subset Personalization.
 "PP": service Provider Personalization.
 "PC": Corporate Personalization.
<mode> integer type
 0 – unlock
 1 – lock
 2 – query status
<passwd> string type, password.
<class> integer type
 1 – voice
 2 – data
 4 – fax
 7 – all telephony except SMS
 8 – short message service
 16 – data circuit synchronization
 32 – data circuit asynchronization
<status> integer type
 0 – off
 1 – on
<err>: error code.

Examples

AT+CLCK=?

+CLCK: ("SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PN","PU","PP","PC")

OK

AT+CLCK="SC",2

+CLCK: 0

OK

AT+CLCK="SC",1,"1234"

+CLCK: 1

OK

AT+CLCK="SC",0,"1234"

+CLCK: 0

OK

5.3 AT+CPIN enter pin

This command enters a password or queries whether or not the module requires a password which is necessary before it can be operated.

AT+CPIN	
Test Command AT+CPIN=?	Response OK
Read Command AT+CPIN?	Response 1) +CPIN: <code> OK 2) +CME ERROR: <err>
Write Command AT+CPIN=<pin>[,<new pin>]	Response 1) OK 2) +CME ERROR: <err>
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<code>: string type without double quotes, The password that the module requires.

READY The SIM card is ready for use (no PIN required).

SIM PIN The SIM card is locked, and the PIN code is required.

SIM PUK The SIM card is blocked due to multiple incorrect PIN attempts, and the PUK (PIN Unblocking Key) code is required.

SIM PIN2 The SIM card is locked, and the PIN2 code is required.

SIM PUK2 The SIM card is blocked due to multiple incorrect PIN2 attempts, and the PUK2 (PIN Unblocking Key) code is required.

PH-NET PIN ME is waiting for network personalization password to be given.

PH-NET PUK ME is waiting for network personalization unblocking password to be given.

PH-NETSUB PIN ME is waiting for network subset personalization password to be given.

PH-NETSUB PUK ME is waiting for network subset personalization unblocking password to be given.

PH-SP PIN ME is waiting for service provider personalization password to be given.

PH-SP PUK ME is waiting for service provider personalization unblocking password to be given.

given.

PH-CORP PIN ME is waiting for corporate personalization password to be given.

PH-CORP PUK ME is waiting for corporate personalization unblocking password to be given.

<pin>: string type, password. If the requested password was a PUK, such as (U)SIM PUK or other password, the <pin> must be followed by <new pin>.

<new pin>: string type, new password required if the requested code is PUK.

<err>: error code.

Examples

AT+CPIN=?

OK

AT+CPIN?

+CPIN: READY

OK

5.4 AT+CPWD change password

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

AT+CPWD

Test Command AT+CPWD=?	Response +CPWD: (list of supported (<fac>,<pwdlen>)s) OK
Write Command AT+CPWD=<fac>,<old pwd>,<new pwd>	Response 1) OK 2) +CME ERROR: <err>
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<fac>: string type

"SC": (U)SIM PIN1.

"P2": (U)SIM PIN2.

"AO": Barr All Outgoing Calls.

"OI": Barr Outgoing International Calls.

"OX": Barr Outgoing International Calls except to Home Country.

"AI": Barr All Incoming Calls.
 "IR": Barr Incoming Calls when roaming outside the home country.
 "AB": All Barring services (applicable only for <mode>=0).
 "AG": All Outgoing barring services (applicable only for <mode>=0).
 "AC": All Incoming barring services (applicable only for <mode>=0).
 <old pwd> string type, password specified for the facility from ME.
 <new pwd> string type, new password.
 <pwdlen> integer type, maximum length of the password.

Examples

AT+CPWD=?

+CPWD: ("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("IR",4),("OI",4),("OX",4),("SC",8),("P2",8)

OK

AT+CPWD="SC","1234","4321"

OK

5.5 AT+CSIM generic SIM access

This command is used for Generic SIM Access, enabling direct communication between a host device (e.g., modem, module) and a SIM (Subscriber Identity Module) card.

AT+CSIM

Test Command AT+CSIM=?	Response OK
Write Command AT+CSIM=<len>,<cmd>	Response 1) +CSIM: <len>,<resp> OK 2) +CME ERROR: <err>
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<len>: integer type, length of <cmd> or <resp> string.
 <cmd>: command passed from MT to SIM card.

<resp>: response to from SIM card to MT.

<err>: error code.

Examples

AT+CSIM=?

OK

AT+CSIM=10,"A083000022"

+CSIM: 4,"6E00"

OK

5.6 AT+CRSM restricted SIM access

This command is used for Restricted SIM Access, enabling controlled communication between a host device (e.g., modem, module) and a SIM (Subscriber Identity Module) card.

AT+CRSM

Test Command AT+CRSM=?	Response OK
Write Command AT+CRSM=<cmd>[,<file id>[,<p1>,<p2>,<p3>[,<data>[,<pathid>]]]	Response 1) +CRSM: <sw1>,<sw2>[,<resp>] OK 2) +CME ERROR: <err>
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<cmd>: integer type, (U)SIM command number.

176 – READ BINARY

178 – READ RECORD

192 – GET RESPONSE

214 – UPDATE BINARY

220 – UPDATE RECORD

242 – STATUS

<file id>: integer type, identifier for an elementary data file on (U)SIM, if used by <cmd>.

<p1><p2><p3>: integer type, parameters transferred by MT to (U)SIM.

<data>: information which shall be written to the (U)SIM(hexadecimal character format, refer AT+CSCS).

<pathid>: the directoy path of an elementary file on SIM in hexadecimal format.

<sw1><sw2>: status information from the (U)SIM about the execution of the actual command. It is returned in both cases, on successful or failed execution of the command.

<resp>: Hexadecimal string containing data read from the (U)SIM.

<err>: error code.

Examples

AT+CRSM=?

+CRSM: (176,178,192,214,220,242),(12037-28599),(0-255),(0-255),(0-255),<data>,<pathid>

OK

AT+CRSM=242

+CRSM:

144,0,"622D8202782183027FF08410A0000000871002FF86FFFF89FFFFFFFFF8A01058B032F0601C609900140830101830181"

OK

5.7 AT+CICCID show ICCID

This command is used to read the Integrated Circuit Card Identifier (ICCID) from a SIM card inserted in a device (e.g., modem, module, or mobile phone).

AT+CICCID

Test Command	Response
AT+CICCID=?	OK
Execution Command	Response
AT+CICCID	1) +CICCID: <ICCID>
	OK
	2) +CME ERROR: <err>
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<ICCID>: string without double quotes, Integrated Circuit Card Identifier number of (U)SIM card.

Examples

AT+CICCID=?

OK

AT+CICCID

+CICCID: 89860426102470239895

OK

5.8 AT+CPINR display remain times to input SIM PIN/PUK

This command queries the number of left input password times of (U)SIM PIN/PUK.

AT+CPINR	
Test Command AT+CPINR=?	Response OK
Read Command AT+CPINR?	Response 1) +CPINR: <PIN times>,<PUK times>,<PIN2 times>,<PUK2 times> OK 2) +CME ERROR: <err>
Characteristic	-
Max Response Time	300ms
Reference	-

Parameters

<PIN times>: integer type, times remain to input PIN code.

<PUK times>: integer type, times remain to input PUK code.

<PIN2 times>: integer type, times remain to input PIN2 code.

<PUK2 times>: integer type, times remain to input PUK2 code.

Examples

AT+CPINR?

+CPINR: 3,3,10,10

OK

5.9 AT+CLSIMDET (U)SIM card detection

This command enable (U)SIM card hot swap function.

AT+CLSIMDET	
Test Command AT+CLSIMDET=?	Response +CLSIMDET: (list of supported<enable>s),(list of supported<level>s) OK
Read Command AT+CLSIMDET?	Response +CLSIMDET: <enable>,<level> OK
Write Command AT+CLSIMDET=<enable>,<level>	Response OK
Characteristic	This command takes effect immediately, and will be saved automatically.
Max Response Time	300ms
Reference	-

Parameters

<enable>: integer type, enable or disable (U)SIM detect.

0 – disable

1 – enable

<level>: integer type, the level of (U)SIM detect pin when (U)SIM card is inserted.

0 – low level

1 – high level

Examples

AT+CLSIMDET=?

+CLSIMDET: (0,1),(0,1)

OK

AT+CLSIMDET=1,1

OK

6 AT Commands for Network

6.1 AT+CREG Network Registration Control

This command is primarily used to control the unsolicited result code reporting behavior when the network registration status of the Mobile Equipment (ME) changes, and to query the current network registration information of the module. When configured with <n>=1, the module will proactively return the unsolicited result code +CREG: <stat> whenever there is a change in the network registration status (e.g., switching from "not registered" to "registered"). When <n>=2, in addition to the registration status change, the module will further return the Location Area Code (LAC) and Cell Identity (CI) if the network cell where the module is located changes, in the format of +CREG: <stat>[,<lac>,<ci>].

AT+CREG Network Registration Control	
Test Command AT+CREG=?	Response +CREG: (list of supported <n>s) OK
Read Command AT+CGEG?	Response 1) +CREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CREG=<n>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<n>: integer type

0 - Disable result code, only "ERROR" will be displayed.

1 - Enable error result code with numeric values.

2 - Enable error result code with string values

<stat>: integer type

0 - not registered, ME is not currently searching a new operator to register to.

1 - registered, home network.

2 - not registered, but ME is currently searching a new operator to register to.

3 - registration denied.

4 - unknown.

5 - registered, roaming.

6 - registered for "SMS only", home network (applicable only when E-UTRAN)

7 - registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)

11- attached for emergency bearer services only

<lac>: string type, Two bytes location area code in hexadecimal format

<ci>: string type, Cell Identify in hexadecimal format.

GSM: Maximum is two bytes.

WCDMA: Maximum is four bytes.

<AcT>: string type, network standard

0 - GSM

2 - UTRAN

3 - GSM W/EGPRS

4 - UTRAN W/HSDPA

5 - UTRAN W/HSUPA

6 - UTRAN W/HSDPA and HSUPA

7 - E-UTRAN

8 - UTRAN HSPA+

<err>: error code.

Examples

AT+CREG=?

+CREG: (0-2)

OK

AT+CREG?

+CREG: 1,6

OK

AT+CREG=2

OK

AT+CREG?

+CREG: 2,6,"3338","0dc540b3",7

OK

6.2 AT+COPS Operator Selection & Configuration

This command serves two core purposes: querying the current network operator and its operating status, and configuring the network selection mode (automatic or manual) of the module.

AT+COPS Operator Selection & Configuration

Test Command AT+COPS=?	Response (1): [+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)]] (2): ERROR (3): +CME ERROR: <err>
Read Command AT+COPS?	Response +COPS: <mode>[,<format>,<oper>[,<AcT>]] OK
Write Command AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]	Response OK
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<mode>: integer type

0 - automatic

1 - manual

2 - force deregister

3 - set only <format>

4 - manual/automatic

NOTE: if <mode> is set to 1, 4 in write command, the <oper> is needed. Normally, LTE is default search mode, So, if not in LTE, the < AcT > is needed.

<format>: integer type

0 - long format alphanumeric <oper>

1 - short format alphanumeric <oper>

2 - numeric <oper><passwd> string type, password.

<oper>: string type, <format> indicates if the format is alphanumeric or numeric.

<stat>: integer type

0 - unknown
 1 - available
 2 - current
 3 - forbidden
<Act>: integer type, Access technology selected
 0 - GSM
 1 - GSM Compact
 2 - UTRAN
 3 - GSM w/EGPRS
 4 - UTRAN w/HSDPA
 5 - UTRAN w/HSUPA
 6 - UTRAN w/HSDPA and HSUPA
 7 - EUTRAN
 8 - UTRAN HSPA+
<err>: error code.

Examples

AT+COPS=?

+COPS:(2, "CHINA MOBILE", "CMCC", "46000", 7), (3, "CHINA BROADNET", "CBN", "46015", 7),,(0,1,2,3,4), (0,1,2)

OK

AT+COPS?

+COPS: 0,2,"46000",7

OK

AT+COPS=0,2,"46000",7

OK

6.3 AT+COPN Operator Name Retrieval

This command is designed to retrieve the list of operator names stored in the ME. For each operator code <numeric_n> that has a corresponding alphanumeric name <alpha_n> in the ME's memory, the command will return the pair <numeric_n>,<alpha_n>. This enables users to quickly obtain the mapping relationship between numeric operator codes and their easily recognizable alphanumeric names, facilitating network identification and management. Whether for debugging, network configuration verification, or user-facing network status display, this command provides essential and user-friendly operator information.

AT+COPN Operator Name Retrieval	
Test Command AT+COPN=?	Response 1) OK 2) ERROR 3) +CME ERROR : <err>
Read Command AT+COPN	Response 1) +COPN: <numeric_1>,<alpha_1> [+COPN: <numeric_2>,<alpha_2> [..]] OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

< numeric_n>: string type, operator in numeric format (see AT+COPS).
 < alpha_n>: string type, String type, operator in long alphanumeric format (see AT+COPS).
 <err>: error code.

Examples

AT+COPN=?

OK

AT+COPN

+COPN: "46000","CHINA MOBILE","CMCC"

+COPN: "46001","CHN-UNICOM","UNICOM"

+COPN: "46002","CHINA MOBILE","CMCC"

+COPN: "46003","CHN-CT","CT"

.....

OK

6.4 AT+CPOL Preferred Network List Editing

This command is dedicated to editing the preferred network list stored on the SIM card. It supports operations such as adding, modifying, and deleting preferred network entries, allowing users to customize the network priority order based on actual usage needs.

AT+CPOL Preferred Network List Editing

Test Command AT+CPOL=?	Response 1) +CPOL: (range of supported <index>s),(range of supported <format>s) OK 2) +CME ERROE : <err>
Read Command AT+CPOL?	Response 1) [+CPOL: <index1>,<format>,<oper_1>[,<GSM>,<GSM_Compact>,<UTRAN>,<LTE>] +CPOL: <index2>,<format>,<oper_2>[,<GSM>,<GSM_Compact>,<UTRAN>,<LTE>] [..]]] OK 2) ERROR 3) +CME ERROR : <err>
Write Command AT+CPOL=<index>,[<format>,[<oper>[,<GSM>,<GSM_Compact>,<UTRAN>,<LTE>]]]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

< index>: integer type, the order number of operator in the SIM preferred operator list.

If only input <index>, command will delete the value indicate by <index>

< **format**>: integer type

0 - long format alphanumeric <oper>

1 - short format alphanumeric <oper>

2 - numeric <oper>

< **oper_n**>: string type. <format> indicates whether the parameter format uses a string format or a numeric format (refer to AT+COPS).< **format**>: integer type

< **GSM**>: integer type, whether to select the GSM network standard.

0 - not selected

1 - selected

< **GSM_compact**>: integer type, whether to select the GSM compact network standard.

0 - not selected

1 - selected

< **UTRA**>: integer type, whether to select the UTRA network standard.

0 - not selected

1 - selected

< **LTE**>: integer type, whether to select the LTE network standard.

0 - not selected

1 - selected

< **err**>: error code.

Examples

AT+CPOL=?

+CPOL: (1-80),(0-2)

OK

AT+CPOL?

+CPOL: 1, 2, "46001", 0, 0, 0, 0

OK

AT+CPOL=2,2,46001,0,0,0,1

OK

6.5 AT+CTZU Auto Time/Time Zone Update

This command is used to enable or disable the automatic time and time zone update function of the module via the Network Identity and Time Zone (NITZ) service. NITZ is a standard feature in mobile networks that allows the network to transmit time and time zone information to the module, ensuring the module's clock remains synchronized with the network time.

AT+CTZU Auto Time/Time Zone Update	
Test Command AT+CTZU=?	Response +CTZU: (range of supported <on/off>s) OK
Read Command AT+CTZU?	Response +CTZU: <on/off> OK
Write Command AT+CTZU=<on/off>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<numeric_n>: Integer type, Automatic time zone update mode.
 0 - Disable automatic time zone update via NITZ.
 1 - Enable automatic time zone update via NITZ.
<err>: error code.

Examples

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

OK

AT+CTZU?
+CTZU:0

OK

AT+CTZU=1
OK

AT+CTZU?
+CTZU:1

OK

6.6 AT+CTZR Time Zone Change Reporting

This command is used to enable or disable the reporting of time zone change events. When the reporting function is enabled, the Mobile Terminal (MT) will proactively return the unsolicited result code +CTZV: <tz>[,<time>][,<dst>] whenever a time zone change occurs. This result code includes key information such as the new time zone (<tz>), the corresponding time (<time>), and daylight saving time status (<dst>), allowing the upper-layer application to promptly respond to time zone changes (e.g., updating the local display time).

AT+CTZR Time Zone Change Reporting

Test Command AT+CTZR=?	Response +CTZR: (range of supported <on/off>s) OK
Read Command AT+CTZR?	Response +CTZR: <on/off> OK
Write Command AT+CTZR=<on/off>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

< numeric_n>: integer type, Automatic time zone update mode.

0 - Disable automatic time zone update via NITZ.

1 - Enable automatic time zone update via NITZ.

<err>: error code.

Examples

AT+CTZR=?

+CTZR:(0-3)

OK

AT+CTZR?

+CTZR:3

OK

AT+CTZR=1

OK

AT+CTZR?

+CTZR:1

OK

7 AT Commands for status

7.1 AT+CFUN Module Functionality Configuration

This command is used to configure the functionality level of the ME, controlling the activation or deactivation of specific module functions, and in some cases, triggering module resets.

Different <fun> values correspond to different functionality states, allowing users to adjust the module's working mode based on power consumption, performance, and functional requirements.

AT+CFUN Module Functionality Configuration	
Test Command AT+CFUN=?	Response +CFUN: (range of supported <fun>s),(range of supported <rst>s) OK
Read Command AT+CFUN=?	Response 1) +CFUN: <fun> OK 2) ERROR 3) +CME ERROR: <err>

Execution Command AT+CFUN=<fun>[,<rst>]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<fun>: integer type

0 - minimum functionality

1 - full functionality, online mode

4 - disable phone both transmit and receive RF circuits

5 - Factory Test Mode

<rst>: integer type

0 - do not reset the ME before setting it to <fun> power level

1 - reset the ME before setting it to <fun> power level. This value only takes effect when <fun> equals 1.

<err>: error code.

Examples

AT+CPIN?

+CPIN: READY

OK

AT+CFUN=0

OK

AT+CFUN=?

+CFUN: 0

OK

AT+CPIN?

+CME ERROR: 13

AT+CFUN=1

OK

7.2 AT+CSQ Signal Quality Query

This command is used to query the Received Signal Strength Indication (<rss>) and the Channel Bit Error Rate (<ber>) of the ME, providing key metrics to evaluate the quality of the current network signal. These metrics are critical for assessing the reliability of communication, diagnosing signal-related issues, and optimizing the module's working environment.

AT+CSQ Signal Quality Query	
Test Command AT+CSQ=?	Response +CSQ: (range of supported <rss>s),(range of supported <ber>s) OK
Execution Command AT+CSQ	Response 1) +CSQ: <rss>,<ber> OK 2) ERROR
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<rss>: integer type
0 -113 dBm or less
1 -111 dBm
2~30 -109... -53 dBm
31 -51 dBm or greater
99 not known or not detectable
<format>: integer type
0 - long format alphanumeric <oper>
1 - short format alphanumeric <oper>
2 - numeric <oper><passwd> string type, password.
<err>: error code.

Examples

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

OK

AT+CSQ

+CSQ: 12,99

OK

7.3 AT+CCLK Real-Time Clock Management

This command is dedicated to managing the Real-Time Clock (RTC) of the module, supporting both reading and setting the current time and time zone. The RTC is essential for time-stamping data, scheduling tasks, and ensuring time-sensitive operations (such as log recording and periodic data transmission) are executed accurately.

AT+CCLK Real-Time Clock Management

Test Command AT+CCLK=?	Response OK
Read Command AT+CCLK?	Response +CCLK: <time> OK
Write Command AT+CCLK=<time>	Response 1) OK 2) ERROR
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<time>: string type; the format is "yy/MM/dd,hh:mm:ss±zz", where each character has the following meaning:

- "yy": Year (last two digits)
- "MM": Month
- "dd": Day
- "hh": Hour (24-hour format)
- "mm": Minute
- "ss": Second
- "±zz": Time zone (indicates the difference between local time and Greenwich Mean Time (GMT), expressed in 15-minute units; "zz" is a mandatory two-digit number with a value range of -96 to 96).

For example: 14:28:10 on April 4, 2000 (GMT+8 time zone) corresponds to the format "00/04/03,16:53:40+32" (Note: The correspondence between time and date in the example shall be subject to the time calculation logic of the actual business scenario, and the core format shall

comply with the "yy/MM/dd, hh:mm:ss±zz" rule).

Examples

```
AT+CCLK=?
OK
AT+CCLK="00/04/03,16:53:40+32"
OK
AT+CCLK?
+CCLK: "00/04/03,16:54:48+32"

OK
```

7.4 AT+CMEE Error Reporting Configuration

This command is used to configure whether the module uses the result codes +CME ERROR: <err> or +CMS ERROR: <err> to indicate errors related to the ME's functionality. When enabled, it further allows setting the format of the error code <err> to either numeric or verbose string, facilitating error diagnosis and troubleshooting.

AT+CMEE Error Reporting Configuration

Test Command AT+CMEE=?	Response +CMEE: (list of supported <n>s) OK
Read Command AT+CMEE?	Response +CMEE: <n> OK
Write Command AT+CMEE=<n>	Response 1) OK 2) ERROR
Execution Command AT+CMEE	Response OK Note: set to the default value
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<n>: integer type

- 0 - Disable result code, only "ERROR" will be displayed.
- 1 - Enable error result code with numeric values.
- 2 - Enable error result code with string values

Examples

AT+CMEE=?

+CMEE: (0-2)

OK

AT+CMEE=2

OK

AT+CMEE?

+CMEE: 2

OK

AT+CMEE

OK

AT+CMEE?

+CMEE: 1

OK

7.5 AT+CPAS Module Activity Status Query

This command is used to query the current activity status (<pas>) of the ME, providing insights into the module's operational state before initiating actions (such as making calls, sending messages, or transmitting data). This helps avoid conflicts or errors caused by attempting operations when the module is in an inappropriate state.

AT+CPAS Module Activity Status Query

Test Command AT+CPAS=?	Response +CPAS: (list of supported <pas>s) OK
Execution Command AT+CPAS	Response +CPAS: <pas> OK
Characteristic	-
Max Response Time	9000ms
Reference	3GPP TS 27.007

Parameters

<pas>: integer type

0 - ready (ME allows commands from TA/TE)

3 - ringing (ME is ready for commands from TA/TE, but the ringer is active)

4 - call in progress (ME is ready for commands from TA/TE, but a call is in progress)

Examples

AT+CPAS=?

+CPAS: (0,3,4)

OK

AT+CPAS

+CPAS: 0

OK

7.6 AT+CLCFG extend configure

AT+CLCFG	
Test Command AT+CLCFG=?	Response +CLCFG: "URC_RI", (list of supported<enable>s), (list of supported<pulse duration>s) +CLCFG: "USBNET", (list of supported<mode>s), (list of supported<enable>s) OK
Characteristic	-
Max Response Time	9000ms
Reference	-

Examples

AT+CLCFG=?

+CLCFG: "URC_RI", (0,1), (5-2000)

+CLCFG: "USBNET", (0,1), (0,1)

OK

7.6.1 AT+CLCFG="URC" configure URC RI

This command configures whether pull down RI or not when general URC output, and set pull down duration time.

AT+CLCFG,"URC_RI"	
Read Command AT+CLCFG="URC_RI"	Response +CLCFG: "URC_RI",<enable>,<pulse duration> OK
Write Command AT+CLCFG="URC_RI",<enable>,<pulse duration>	
Characteristic	-
Max Response Time	9000ms
Reference	-

Parameters

<enable>: integer type

0 – disable pull down RI

1 – enable pull down RI

<pulse duration>: integer type, RI pulse duration time, unit ms, range: 5 – 2000, default: 120

Examples

AT+CLCFG="URC_RI",1,200

OK

AT+CLCFG="URC_RI"

+CLCFG: "URC_RI",1,200

OK

7.6.2 AT+CLCFG="USBNET" configure USB net mode

This command configure USB net mode is ECM or RNDIS.

AT+CLCFG,"USBNET"	
Read Command AT+CLCFG="USBNET"	Response +CLCFG: "USBNET",<mode>,<enable> OK

Write Command AT+CLCFG="USBNET",<mode>,<enable>	Response OK
Characteristic	This command will be take effect after restart or reset, and please wait a moment before restart to waiting save done.
Max Response Time	9000ms
Reference	-

Parameters

<mode>: integer type

0 – RNDIS

1 – ECM

<enable>: integer type

0 – disable USB net function

1 – enable USB net function

8 Packet Domain Commands

8.1 AT+CGATT Attachment or Detachment of PS

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

AT+CGATT Attachment or Detachment of PS

Test Command AT+CGATT=?	Response +CGATT: (list of supported <state>s) OK
Write Command AT+CGATT?	Response +CGATT: <state> OK
Execution Command AT+CGATT=<state>	Response OK If there is any error related to ME functionality: +CME ERROR: <err>
Characteristic	Whether the command takes effect determined by network. The configuration will not be saved.
Max Response Time	9000ms.

Reference	3GPP TS 27.007
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Parameters

<state>: integer type, Indicates the state of PS attachment.

0 - Detached

1 - Attached

<err>: error code.

Examples

AT+CGATT=1

OK

8.2 AT+CGDCONT Define PDP Context

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

AT+CGDCONT Define PDP Context

Test Command AT+CGDCONT=?	Response 1) +CGDCONT: (range of supported <cid>s),<PDP_type>,<APN>,<PDP_addr>,(range of supported <data_comp>s),(range of supported <head_comp>s),(list of supported <IPv4_addr_alloc>s),(list of supported <request_type>s) OK 2) ERROR
Read Command AT+CGDCONT?	Response 1) +CGDCONT: <cid>,<PDP_type>,<APN>,<PDP_addr>,<data_comp>,<head_comp>,<IPv4_addr_alloc>,<request_type> [...] OK 2) ERROR
Write Command AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<data_comp>[,<head_comp>[,<IPv4_	Response 1) OK 2)

addr_alloc>[,<request_type>]]]	ERROR
Characteristic	The configurations will be saved automatically.
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

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

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

"IP" Internet Protocol (IETF STD 5)

"IPv6" Internet Protocol Version 6

"IPv4V6" Dual PDN Stack

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

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

<data_comp>: integer type, Controls PDP data compression (applicable for SNDCP only) (refer to 3GPP TS 44.065).

0 - Off (Default if value is omitted)

1 - On (Manufacturer preferred compression)

2 - V.42bis

<head_comp>: integer type, Controls PDP header compression.

0 - Off (Default if value is omitted)

1 - On

2 - RFC1144

<IPv4_addr_alloc>: integer type, Controls how the MT/TA requests to get the IPv4 address information.

0 - IPv4 address allocation through NAS signaling

1 - IPv4 address allocated through DHCP

<request_type>: integer type, Indicate the type of PDP context activation request for the PDP context.

0 - PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific).

1 - PDP context is for emergency bearer services

2 - PDP context is for new PDP context establishment

<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.

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.

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

Examples

AT+CGDCONT=1,"IP","CMNET"

OK

AT+CGDCONT?

+CGDCONT: 1,"IP","CMNET","10.114.88.119",0,0,,,

OK

8.3 AT+CGDSCONT Define Secondary PDP Context

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

AT+CGDSCONT Define Secondary PDP Context

Test Command AT+CGDSCONT=?	Response 1) +CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),<PDP_type>,(list of supported <d_comp>s),(list of supported <h_comp>s), (list of supported <imCnSignallingFlagInd>s) OK 2) ERROR
Read Command AT+CGDSCONT?	Response 1) +CGDSCONT: [<cid>,<p_cid>,<d_comp>,<h_comp>,<imCnSignallingFlagInd> ... OK 2)

	ERROR
Write Command AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>[,<imCnSignallingFlagInd>]]]]	Response 1) OK 2) ERROR
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

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

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

"IP" Internet Protocol

"IPV6" Internet Protocol Version 6

"IPV4V6" Dual PDN Stack

<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 SMDCP only) (refer 3GPP TS 44.065 [61]).

0 - off

1 - on (manufacturer preferred compression)

2 - V.42bis

<h_comp>: integer type, controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]).

<imCnSignallingFlagInd>: integer type, indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.

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

Examples

AT+CGDSCONT?

OK

8.4 AT+CGTFT Traffic Flow Template

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 15 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.

AT+CGTFT Traffic Flow Template

Test Command AT+CGTFT=?	Response +CGTFT: <PDP_type>,(list of supported <packet filter identifier>s),(list of supported <evaluation precedence index>s),(list of supported <source address and subnet mask>s),(list of supported <protocol number (ipv4)/ next header (ipv6)>s),(list of supported <destination port range>s),(list of supported <source 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) [...] OK
Write Command AT+CGTFT?	Response 1) +CGTFT: [<cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4)/ next header (ipv6)>,<source port range>,<destination port range>,<ipsec security parameter index (spi)>,<type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>,<direction> [...] OK 2) ERROR
Write Command AT+CGTFT=<cid>[,<packet filter identifier>,<evaluation precedence index>[,<source address and subnet mask>[,<protocol number (ipv4)/ next header (ipv6)>[,<destination port range>[,<source port range>[,<ipsec security	Response 1) OK 2) ERROR

parameter index (spi)>[,<type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>[,<flow label (ipv6)>[,<direction>]]]]]]]]]	
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<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 15.

<evaluation precedence index>: integer type, Value range is from 0 to 255.

<source address and 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.
 NOTE: subnet mask can't be 0.0.0.0

<protocol number (ipv4)/ next header (ipv6)>: integer type, Value range is from 0 to 255.

<destination port range>: string type, The string is given as dot-separated numeric (0-65535)parameters on the form "f.t".

<source 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)>: integer type, 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)>: integer type, 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.

0 - Pre-Release 7 TFT filter
 1 - Uplink
 2 - Downlink
 3 - Up & Downlink

Examples

AT+CGTFT=1,1,0,"10.190.220.152.255.255.255.255"

OK

AT+CGTFT?

```
+CGTFT: 1,1,0,"10.190.220.152.255.255.255.255",,"","",,"",3
OK
```

8.5 AT+CGACT Activate or Deactivate PDP Context

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

AT+CGACT Activate or Deactivate PDP Context

Test Command AT+CGACT=?	Response +CGACT: (list of supported <state>s) OK
Write Command AT+CGACT?	Response +CGACT: <cid>,<state> [+CGACT: <cid>,<state> ...] OK
Write Command AT+CGACT=<state>,<cid>	Response OK Or NO CARRIER If there is any error related to ME functionality: +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<state>: integer type, Indicates the state of PS attachment.

0 - Deactivated

1 - Activated

Other values are reserved and will result in an ERROR response to the Write Command

<cid>: integer type, Specifies a particular PDP context definition (see AT+CGDCONT).

<err>: error code.

Examples

```
AT+CGACT=1,2
```

```
OK
```

AT+CGACT?

+CGACT: 1,1

+CGACT: 2,1

OK

8.6 AT+CGREG Network Registration Status

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

AT+CGREG Network Registration Status

Test Command AT+CGREG=?	Response +CGREG: (Range of supported <n>s) OK
Read Command AT+CGREG?	Response +CGREG: <n>,<stat>[,<lac>,<ci>[,<AcT>]] OK
Write Command AT+CGREG[=<n>]	Response OK Or ERROR
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<n>: integer type, Control the presentation of the specified URC.

0 - Disable network registration unsolicited result code

1 - Enable network registration unsolicited result code +CGREG: <stat>

2 - Enable network registration and location information unsolicited result code

+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]

<stat>: integer type, Network registration status.

0 - Not registered. MT is not currently searching an operator to register to. The UE is in GMM state GMM-NUL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, but the UE is allowed to attach for GPRS if requested by the user.

1 - Registered, home network. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on the home PLMN.

2 - Not registered, but MT is currently trying to attach or searching an operator to register

to. UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.

3 - Registration denied. The UE is in GMM state GMM-NULL. The GPRS service is disabled, and the UE is not allowed to attach for GPRS if requested by the user.

4 - Unknown

5 - Registered, roaming

6 - registered for "SMS only", home network(applicable only when E-UTRAN)

11 - attached for emergency bearer services only

<lac>: string type, Two-byte location area code in hexadecimal format

<ci>: string type, 16 bit (GSM) or 28 bit (UMTS/LTE) cell ID in hexadecimal format.

Examples

AT+CGREG=2

OK

AT+CGREG?

+CGREG: 2,1,9A12,05188A80

OK

8.7 AT+CGDATA Enter Data State

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

AT+CGDATA Enter Data State

Test Command AT+CGDATA=?	Response +CGDATA: (list of supported <L2P>s) OK
Write Command AT+CGDATA=<L2P>[,<cid>[,<cid> [...]]]	Response 1) CONNECT 2) ERROR 3) +CME ERROR: <err>
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<L2P>: string type, Indicates the layer 2 protocol to be used between the TE and MT:
 NULL
<cid>: integer type, Specifies a particular PDP context definition (see AT+CGDCONT).
<err>: error code.

Examples

```
AT+CGDATA=?
+CGDATA: ("" )

OK
```

8.8 AT+CGPADDR Show PDP Address

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

AT+CGPADDR Show PDP Address

Test Command AT+CGPADDR=?	Response +CGPADDR: (list of defined <cid>s) OK
Write Command AT+CGPADDR[=<cid>[,<cid>[,...]]]	Response 1) +CGPADDR: <cid>,<PDP_addr> [+CGPADDR: <cid>,<PDP_addr> ...] OK 2) [+CGPADDR: <cid>,<PDP_addr_1><PDP_addr_2>] +CGPADDR: <cid>,<PDP_addr_1><PDP_addr_2> [..] OK 3) ERROR
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<PDP_addr>: string type, Identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by AT+CGDCONT when the

context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.

<PDP_addr_1>: string type, IPv4 addresses

<PDP_addr_2>: string type, IPv6 addresses

<cid>: integer type, Specifies a particular PDP context definition (see AT+CGDCONT).

<err>: error code.

Examples

AT+CGPADDR

+CGPADDR: 1, "10.166.2.213", "254.128.0.0.0.0.0.0.0.0.0.0.0.1"

OK

8.9 AT+CGEREP Packet Domain Event Reporting

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

AT+CGEREP Packet Domain Event Reporting

Test Command AT+CGEREP=?	Response +CGEREP: (range of supported <mode>s),(list of supported bfr>s) OK
Read Command AT+CGEREP?	Response +CGEREP: <mode>,<bfr> OK
Write Command AT+CGEREP=mode[,<bfr>]	Response 1) OK 2) ERROR
Execution Command AT+CGEREP	Response OK
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<mode>: integer type, Controls the processing of unsolicited result codes specified within this command.

0 - Buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No code is 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, Controls the effect on buffered codes.

0 - MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is specified.

1 - MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is specified (OK response shall be given before flushing the codes).

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.

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). 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). The format of the parameter <class> is found in command +CGCLASS.

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. 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] clause 10.5.6.20.

0 - offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu 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 lu mode.

2 - offloading the traffic of the PDN connection via a WLAN when in lu 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 lu mode is acceptable.

Examples

AT+CGEREP?

+CGEREP: 2,0

OK

AT+CGEREP=2,0

OK

8.10 AT+CEREG EPS Network Registration Status

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

AT+CEREG EPS Network Registration Status

Test Command AT+CEREG=?	Response +CEREG: (range of supported <n>s) OK
Read Command AT+CEREG?	Response +CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]] OK
Write Command AT+CEREG[=<n>]	Response OK Or ERROR
Characteristic	-
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<n>: integer type, Control the presentation of the specified URC.

0 - Disable network registration unsolicited result code

1 - Enable network registration unsolicited result code +CGREG: <stat>

2 - Enable network registration and location information unsolicited result code

+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]

<stat>: integer type, Network registration status.

0 - Not registered. MT is not currently searching an operator to register to. The UE is in GMM state GMM-NUL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, but the UE is allowed to attach for GPRS if requested by the user.

1 - Registered, home network. The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on the home PLMN.

2 - Not registered, but MT is currently trying to attach or searching an operator to register to. UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available.

3 - Registration denied. The UE is in GMM state GMM-NULL. The GPRS service is disabled, and the UE is not allowed to attach for GPRS if requested by the user.

4 - Unknown

5 - Registered, roaming

6 - registered for "SMS only", home network(applicable only when E-UTRAN)

11 - attached for emergency bearer services only

<ta>: string type, Two-byte tracking area code in hexadecimal format.

<ci>: string type, 16 bit (GSM) or 28 bit (UMTS/LTE) cell ID in hexadecimal format.

<Act>: string type, Access technology selected.

0 - GSM

2 - UTRAN

3 - GSM W/EGPRS

4 - UTRAN W/HSDPA

5 - UTRAN W/HSUPA

6 - UTRAN W/HSDPA and HSUPA

7 - E-UTRAN

Examples

AT+CEREG?

+CEREG: 3,1,"9a12","05188a83",7

OK

AT+CEREG=1

OK

8.11 AT+CLGDCNT Packet Data Counter

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

AT+CLGDCNT Packet Data Counter

Test Command AT+CLGDCNT=?	Response +CLGDCNT: (list of supported <op>s) Ok
Read Command AT+CLGDCNT?	Response +CLGDCNT: <bytes_sent>,<bytes_rcv> OK
Write Command AT+CLGDCNT=<op>	Response 1)

	OK 2) ERROR
Characteristic	The configurations will be saved automatically.
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<op>: integer type, The operation about data counter.

0 - Reset the data counter

1 - Save the results of data counter to NVM

If results need to be automatically saved, refer to AT+CLAUGDCNT.

<bytes_sent>: integer type, The amount of sent bytes.

<bytes_rcv>: integer type, The amount of received bytes

<err>: error code.

Examples

AT+CLGDCNT?

+CLGDCNT: 184,104

OK

AT+CLGDCNT=1

OK

8.12 AT+CLAUGDCNT Auto Save Packet Data Counter

This command allows AT+CLGDCNT to save results to NVM automatically.

AT+CLAUGDCNT Auto Save Packet Data Counter

Test Command AT+CLAUGDCNT=?	Response +CLAUGDCNT: (list of supported <value>s) OK
Read Command AT+CLAUGDCNT?	Response +CLAUGDCNT: <value> OK
Write Command AT+CLAUGDCNT=<value>	Response 1) OK 2) ERROR
Characteristic	The configurations will be saved automatically.
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<value>: integer type, This parameter is the time-interval for AT+CLGDCNT to save results to NVM automatically. Range: 0, 30–65535. Default: 0. Unit: second. If it is set to 0, auto-save is disabled.

Examples

AT+CLAUGDCNT=30

OK

AT+CLAUGDCNT?

+CLAUGDCNT: 30

OK

8.13 AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

This command is used to set type of authentication for PDP-IP connections of GPRS.

AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

Test Command AT+CGAUTH=?	Response +CGAUTH: (range of supported <cid>s),(list of supported <auth_type>s),50,50 OK Or ERROR If there is any error related to ME functionality: +CME ERROR: <err>
Read Command AT+CGAUTH?	Response OK Or ERROR If there is any error related to ME functionality: +CME ERROR: <err>
Write Command AT+CGAUTH=<cid>[,<auth_type>[,<passwd>[,<user>]]]	Response OK Or ERROR If there is any error related to ME functionality: +CME ERROR: <err>
Execution Command AT+CGAUTH	Response 1)

	OK 2) ERROR 3) +CME ERROR: <err>
Characteristic	The configurations will be saved automatically.
Max Response Time	9000ms.
Reference	3GPP TS 27.007

Parameters

<cid>: integer type, Specifies a particular PDP context definition (see AT+CGDCONT).

<auth_type>: integer type, Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters <passwd> and <user> need to be specified.

0 - none
 1 - PAP
 2 - CHAP

<passwd>: string type, Password for access to the IP network.

<user>: string type, Username for access to the IP network.

<err>: error code.

Examples

AT+CGAUTH=1,2,"password","user"

OK

AT+CGAUTH?

+CGAUTH: 1,2,"user","password"

OK

15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

15.21 Changes or modification warning.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

RF warning for Mobile device:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:**2.2 List of applicable FCC rules**

This module has been tested for compliance to FCC Part 15

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not application

2.5 Trace antenna designs

Not application

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type(External)	FDD LTE Band 2: 1.34 dBi FDD LTE Band 4: 1.29 dBi FDD LTE Band 5: -1.65 dBi FDD LTE Band 12: -1.39 dBi FDD LTE Band 13: -3.67 dBi FDD LTE Band 17:-1.54 dBi FDD LTE Band 66: 1.29 dBi FDD LTE Band 71:-1.52 dBi
Antenna connector	SMA

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2BSX3-TC10A-NA". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

Industry Canada statement

This K019-CW43-DW complies with ISSED's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d' ISSED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

This equipment complies with ISSED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISSED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

IC statement

The final end product must be labeled in a visible area with the following "Contains IC: 34826-TC10A-NA"

The Host Marketing Name (HMN) must be indicated at any location on the exterior of the host product or product packaging or product literature, which shall be available with the host product or online.

This radio transmitter [IC: 34826-TC10A-NA] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the

maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Frequency range	Manufacturer	Peak gain	Impedance	Antenna type
FDD LTE Band 2		1.34 dBi	50ohm	External Antenna
FDD LTE Band 4		1.29dBi	50ohm	External Antenna
FDD LTE Band 5		-1.65dBi	50ohm	External Antenna
FDD LTE Band 12		-1.39dBi	50ohm	External Antenna
FDD LTE Band 13		-3.67dBi	50ohm	External Antenna
FDD LTE Band 17		-1.54dBi	50ohm	External Antenna
FDD LTE Band 66		1.29dBi	50ohm	External Antenna
FDD LTE Band 71		-1.52dBi	50ohm	External Antenna

1.The OEM integrator must be aware not to provide information to the end user regarding how to install or remove this RF module in the user manual of the end product. The user manual which is provided by OEM integrators for end users must include the following information in a prominent location.

L'intégrateur OEM doit être conscient de ne pas fournir d'informations à l'utilisateur final sur la manière d'installer ou de retirer ce module RF dans le manuel d'utilisation du produit final. Le manuel d'utilisation fourni par les intégrateurs OEM pour les utilisateurs finaux doit inclure les informations suivantes dans un emplacement visible.

2.To comply with IC RF exposure compliance requirements, the antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with IC multi-transmitter product procedures. Pour se conformer aux exigences de conformité de l'exposition RF IC, l'antenne utilisée pour cet émetteur ne doit pas être co-localisée ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, sauf conformément aux procédures du produit multi-émetteur IC.

3.The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system. L'intégrateur système final doit s'assurer qu'aucune instruction n'est fournie dans le manuel de l'utilisateur ou dans la documentation du client indiquant comment installer ou retirer le module transmetteur, sauf qu'un tel dispositif a mis en place une authentification bidirectionnelle entre le module et le système hôte.

4. The host device shall be properly labelled to identify the module within the host device. The end product must be labeled in a visible area with the following: "Contains IC:34826-TC10A-NA " Any similar wording that expresses the same meaning may be used.

Le périphérique hôte doit être correctement étiqueté pour identifier le module dans le périphérique hôte. Le produit final doit être étiqueté dans une zone visible avec: "Contains IC: 34826-TC10A-NA " Toute formulation similaire exprimant la même signification peut être utilisée.

The IC Statement below should also be included on the label. When not possible, the IC Statement should be included in the User Manual of the host device. "This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two

conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."